2024 Annual Water Quality Report

John Deere Dubuque Works Landfill
Dubuque, Iowa

January 2025

Permit No. 31-SDP-01-75C

Prepared For:

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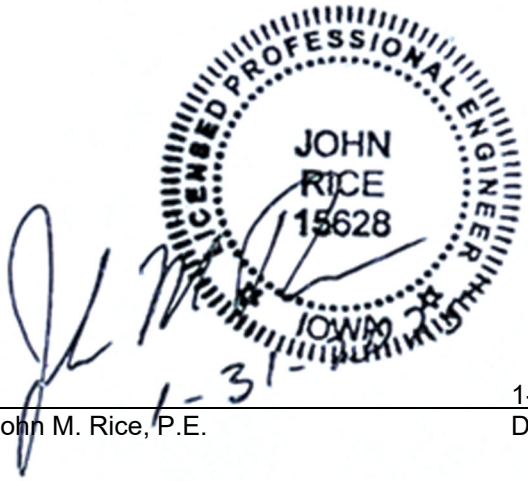
CERTIFICATION AND PROJECT SUMMARY

I hereby certify that this engineering document was prepared by me, or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.



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Site location:	North ½ of the Southwest ¼ of Section 27, Township 90 North, Range 2 East, Dubuque County, Iowa

EXECUTIVE SUMMARY

This 2024 Annual Water Quality Report (AWQR) was prepared by TRC Environmental Corporation (TRC) on behalf of the John Deere Dubuque Works (JDDW) industrial waste landfill in Dubuque, Iowa. The purpose of this report is to evaluate the effect of the facility on groundwater quality and describe the general post closure conditions of the landfill. The report is based upon the results of semiannual sampling, semiannual site inspections, and monthly leachate system monitoring. The annual leachate collection system performance evaluation (LCSPE) is included as a supplement to the AWQR.

Period of Report Coverage

This 2024 AWQR is for the period of November 2023 to October 2024. Semiannual groundwater and leachate sampling events occurred in April 2024 and October 2024. In addition, monthly leachate system monitoring occurred during the period of report coverage.

Report Priority

There are not currently any actions or activities on hold pending Iowa Department of Natural Resources (IDNR) review or comment.

Site Status and Applicable Rules

The JDDW industrial waste landfill is permanently closed and no longer receives waste. Landfill operations began in 1974 and the final cover construction was completed in 2012. The landfill waste stream consisted primarily of powerhouse ash generated by JDDW and the landfill was developed in two phases, which are identified as Stage 1 and Stage 2.

This AWQR was prepared in accordance with the requirements of Chapters 567 Iowa Administrative Code (IAC) 115.26(8)(d), 567 IAC 115.26(14), and the special requirements of the Closure Permit No. 31-SDP-01-75C, which was issued by the IDNR on May 24, 2012 and amended most recently on August 17, 2023 (IDNR, 2023).

Recent Changes to Groundwater and Leachate Monitoring

The following changes to the groundwater and leachate monitoring were implemented within the 2023 reporting period (refer to report text for further details):

- As required by the Closure Permit amendment dated August 17, 2023 (IDNR, 2023), additional parameters were added for groundwater monitoring starting in Fall 2023.
- The same additional parameters were also added for the leachate and underliner sampling starting in Fall 2023, following a request from the IDNR for the leachate to be sampled for the same parameters as the underliner and groundwater monitoring points in their response letter to the 2022 AWQR.
- Additional sample points for the leachate and underliner liquid were included starting in Fall 2023.
- Leachate system monitoring procedures were revised during 2023.

Past Changes to Report Format and Statistical Methods

Starting with the 2021 AWQR, the statistical methods for evaluating groundwater results were revised and the report format was updated, as requested by the IDNR. Due to the updated statistical methods, the municipal landfill report template was used; however, some adjustments were made to the report format based on the site-specific monitoring plan and permit requirements.

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ACRONYMS AND ABBREVIATIONS

AWQR	Annual Water Quality Report
GWPS	Groundwater protection standard
HMSP	Hydrologic Monitoring System Plan
IAC	Iowa Administrative Code
IDNR	Iowa Department of Natural Resources
JDDW	John Deere Dubuque Works
MCL	USEPA Maximum Contaminant Level
RCRA	Resource Conservation and Recovery Act
RL	Reporting limit
SSI	Statistically significant increase above background
SSL	Statistically significant level above groundwater protection standard
USEPA	United States Environmental Protection Agency

1.0 Site Background and Monitoring Program

1.1 Site Location and Facility Information

The JDDW industrial waste landfill covers approximately 12 acres and is located in the North ½ of the Southwest ¼ of Section 27, Township 90 North, Range 2 East in Dubuque County, Iowa (Figure 1). The facility began operations in 1974 and is owned and operated by JDDW. The landfill was developed in two phases, which are identified as Stage 1 and Stage 2. The landfill waste stream consisted primarily of powerhouse ash generated by JDDW. The landfill is permanently closed and no longer receives waste, with the final cover construction completed in 2012.

1.2 Hydrogeology and Monitoring Well Network

A hydrogeologic investigation report titled "Hydrogeologic Investigation at the John Deere Dubuque Works Sanitary Landfill" was prepared in February 1990 by James Montgomery Associates (JMA) (JMA, 1990). Select descriptions of the site geology from the hydrogeologic investigation report are provided below:

> *"…the upland area is covered with silty clay material approximately 18 feet thick. This layer thins to the southwest where only three feet of cover material is found. Underlying the silty clay material are carbonate rocks of Ordovician age…"*
>
> *"The uppermost bedrock unit at the landfill site is the Ordovician-aged Galena Group of the Decorah Formation. This unit is composed of uniformly bedded carbonate rocks (limestones and dolomites) and is the principal source of potable water in the area."*

The approved groundwater monitoring well network at the JDDW closed industrial waste landfill consists of one upgradient groundwater monitoring well (MW-1) and two downgradient wells (MW-2 and MW-3), as shown on Figure 2. The wells were installed in 1989 and the boring logs and well construction forms are included in Appendices B and C, respectively, of the hydrogeologic investigation report (JMA, 1990) (see discussion of top of casing elevations below). The wells were originally referred to as piezometers named PZ-1, PZ-2, and PZ-3.

Based on the boring logs, the monitoring wells are installed in bedrock described as dolomite with increasing shale content with depth. The wells are installed to total depths of approximately 124 to 196 feet below ground surface and are constructed with 30-foot screens. The well screens are fully submerged; groundwater elevations are typically at least 15 feet higher than the top of screen elevations based on measurements collected since 1991. A slug test was performed for MW-1 (referred to as PZ-1 at the time), and the hydraulic conductivity calculated from the slug test was 5.76×10^{-6} feet per second (JMA, 1990).

1.2.1 Monitoring Well Top of Casing Elevations

The monitoring wells were resurveyed during Fall 2023, as reported and discussed in the 2023 AWQR. The elevations from the Fall 2023 survey are used in this report. In addition, it has been assumed that the total depths of the monitoring wells are the same as the depths used prior to the Fall 2023 resurvey.

The top of casing elevations used prior to the Fall 2023 survey differed from those on the well construction forms included in the hydrogeologic investigation report due to (1) a reduction in top of casing elevation by 0.02 ft for each well when the dedicated pumps were removed in early October 2017, and (2) different top of casing elevations noted for MW-2 between different sources of information. Prior to the October 2017 removal of the dedicated pumps, a top of casing elevation of 848.77 feet was used for calculating the groundwater elevations for MW-2, consistent with the well diagrams included in previous AWQRs at least as early as 1995. However, the top of casing elevation for MW-2 was noted as 848.78 feet on Table 2-1 of the hydrogeologic investigation report, and as 848.98 feet on the well construction form included in the hydrogeologic investigation report.

1.3 Groundwater Monitoring Program

Groundwater monitoring is performed in accordance with the revised Closure Permit (IDNR, 2023), which was most recently amended on August 17, 2023 to include supplemental sampling and analysis of monitoring points MW-1, MW-2, and MW-3 for additional parameters (sulfate, total dissolved solids [TDS], total boron, total calcium, total lithium, and total molybdenum). The groundwater monitoring program is summarized in the table below. The monitoring program is described in more detail in the Hydrologic Monitoring System Plan (HMSP), which was updated in April 2024. An overview of the monitoring program is provided in Table 1, and the monitoring program implementation schedule is summarized in Table 2.

JDDW Landfill Groundwater Monitoring Program

Semi-Annual (April and October)		
pH	Nitrates, as Nitrogen	Barium (total)[1]
Conductivity	Ammonia, as Nitrogen	Iron (total)[1]
Temperature	Fluoride	Magnesium (total)[1]
Color	Chloride	Boron (total)[4]
Odor	Chemical Oxygen Demand	Calcium (total)[4]
Turbidity (visual and measured)[2]	Sulfate[4]	Lithium (total)[4]
	Total Dissolved Solids (TDS)[4]	Molybdenum (total)[4]
Annual (October)		
Total phenols		
Every 5 Years (October 2018, 2023, etc.)		
Volatile Organic Compounds (VOCs)[3]		

Notes:

[1] The analysis of metals (barium, iron, and magnesium) at the site historically included only dissolved-phase concentrations. Following review of the 2016 AWQR, the IDNR requested that JDDW test for total (unfiltered) metals rather than dissolved (filtered) metals. Analysis of total metals began in October 2017. In May 2018, the IDNR approved the variance requested for the analysis of total metals instead of dissolved metals. Because trends in groundwater quality had been primarily based on dissolved metals, JDDW continued to collect both filtered and unfiltered samples until a statistically significant correlation was determined between these two data sets in October 2019. The collection of dissolved (filtered) metals samples was discontinued after the October 2019 sampling event. As of the 2019 AWQR, background levels for metals have been calculated based on total metals results.

[2] The April 2024 HMSP was updated to include measured values for turbidity, as requested by the IDNR in their review of the 2020 AWQR.

[3] Annual sampling for Total Organic Halogens (TOX) was previously completed for the landfill. In May 2018, IDNR approved removing TOX from the sampling program, and replacing TOX with analysis for VOCs every 5 years.

[4] Parameter added starting in Fall 2023 based on the revised Closure Permit (IDNR, 2023).

1.4 Leachate Collection System Overview

The leachate collection system consists of leachate collection piping and a 10,000-gallon underground leachate collection tank. The piping includes an 8-inch-diameter vertical perforated standpipe surrounded by crushed rock located within Stage 1 and a similar standpipe design in Stage 2. Each standpipe functions as a leachate collection well and is connected to a separate, solid 4-inch-diameter gravity drain line that discharges to the leachate collection tank. In addition, a 4-inch-diameter perforated underliner gravity drain pipe is laid within the underliner (one pipe for each stage) and is connected to a solid pipe that conveys liquid collected within the underliner to the leachate collection tank. The leachate drain lines drain freely while the leachate collection system wet valves are open, as during typical operation of the leachate collection system. The underliner drain lines were designed to drain freely at all times as a secondary leachate collection system. The leachate collection tank contains a submersible pump that pumps leachate to the pond adjacent to building X-18 farther southeast of the landfill for discharge through NPDES Outfall #008 to the Little Maquoketa River.

1.5 Leachate and Underliner Sampling

Prior to Fall 2023, the semiannual sampling typically included one sample referred to as "Combined Leachate" collected from the leachate collection tank (which receives liquid from the leachate drain lines and underliner drain lines from Stages 1 and 2) and one sample from the Stage 1 underliner drain line (while the leachate drain valves are open, as during typical operating conditions), which has often been referred to previously as "Underliner." The Stage 2 underliner drain line had not been sampled as there has been no record of flow observed from the line while the leachate valves are open (as during typical operation).

To better understand the composition of the leachate and underliner liquid from Stage 1 and Stage 2, TRC proposed to collect samples from additional sampling points starting in Fall 2023, which has been continued through 2024. The current sampling of leachate and underliner liquids includes the following:

- Stage 1 and Stage 2 leachate drain lines while the leachate drain valves are open (as during typical operating conditions)
- Stage 1 and Stage 2 underliner drain lines while the leachate drain valves are open, if flowing. (Note, the Stage 2 underliner drain line does not typically have flow while the leachate valves are open and has not been sampled.)
- Stage 1 and Stage 2 underliner drain lines after the leachate valves have been closed (which prevents leachate from draining via the leachate drain lines and allows leachate levels to back up into the standpipe within each stage).
- Liquid from the leachate collection tank, which receives liquid from the leachate drain lines and underliner drain lines from Stages 1 and 2. This sample is referred to as "Combined Leachate."

The leachate and underliner liquid samples collected in 2024 were analyzed for the same parameters as the groundwater monitoring points. In their response letter to the 2022 AWQR, the IDNR requested that leachate be sampled for the same parameters as the underliner and groundwater monitoring points.

2.0 Site Inspection and Surface Water Quality

A documentation report titled “Closure Compliance Report” was submitted to the IDNR by IIW, P.C. on November 13, 2012 (IIW, 2012). On January 13, 2013, the IDNR approved the closure of the landfill. The final grades within the limits of the landfill were constructed per the requirements of the landfill closure plan. The final cover configuration includes a 2-foot thick compacted clay layer and a 2-foot thick cover soil layer to support vegetative growth. The final cover was designed to promote surface water runoff from the facility and to minimize infiltration through the cover.

2.1 Current Site Conditions

The semi-annual facility inspection reports for April and October 2024 are included in Appendix B. Inspection findings include the following:

- The landfill cover is in good condition and does not display significant signs of erosion or rutting. During the April and October inspections, small animal burrows were noted at various locations across the landfill cap.
- Standing water was not present during the April or October inspection.
- The fence and gates surrounding the landfill are in good working condition with a working lock and signs are present along the perimeter.
- The gravel road leading to the pump house is in good condition.
- The Stage 1 and Stage 2 leachate standpipe covers need to be replaced.

2.2 Potential Impacts on Surface Water

The closure permit for the landfill (no. 31-SDP-01-75C) does not require surface water monitoring to be performed[1]. However, the permit does require that the final cover be maintained to minimize erosion, and that JDDW repair areas of erosion or damage (if any) to the cover that are noted during site inspections. Erosion was not observed during the April or October 2024 inspections.

[1] It is the understanding of TRC that JDDW completes monitoring for the entire facility in accordance with their storm water pollution prevention plan (SWPPP).

3.0 Monitoring Well Performance Evaluation

Monitoring well performance is evaluated in accordance with Chapter 567 IAC 115.21(2) and the revised Closure Permit (IDNR, 2023). This evaluation is intended to confirm that the site monitoring wells are adequately functioning and can provide data useable in assessing the groundwater flow and groundwater quality near the site.

The monitoring well maintenance and performance reevaluation schedule is summarized in Table 3.

3.1 Water Levels and Flow Direction

The revised Closure Permit (IDNR, 2023) Section X, Paragraph 4, Item I requires the collection of monthly water level measurements for each monitoring well. Additionally, Chapter 567 IAC 115.21(2)"a" and "b" require:

a) A biennial examination of high and low water levels accompanied by a discussion of the acceptability of well location (vertically and horizontally) and exposure of the screened interval to the atmosphere.

b) A biennial evaluation of water level conditions in the monitoring wells to ensure that the effects of waste disposal or well operation have not resulted in changes in the hydrologic setting and resultant flow paths.

Groundwater elevations measured during the semiannual groundwater monitoring events are presented in Table 4a. Monthly groundwater elevations are provided in Table 4b. The groundwater elevations have remained above the screened portion of each monitoring well. Potentiometric contour maps based on groundwater elevations measured by TRC in April 2024 and October 2024 are shown on Figures 2 and 3, respectively. The direction of groundwater flow is toward the southeast from MW-1 to MW-2 and MW-3, which is consistent with previous observations.

3.2 Well Depths

Chapter 567 IAC 115.21(2)"c" requires annual measurement of well depths to ensure that wells are physically intact and not filling with sediment. Well depths were measured during the Spring and Fall 2024 monitoring events (Table 4a), and the depths were within the expected measurement tolerance given the depths of the wells.

3.3 Recharge Rates

In accordance with the variance granted December 20, 2021, the permit holder is authorized to evaluate well recharge rates (i.e., low flow purge rates during groundwater sampling) in lieu of the in-situ permeability testing required by 567 IAC 115.21(2)"d" to determine if well deterioration is occurring.

Low flow purge rates were documented in the field notes during both semiannual sampling events (Appendix B). Low flow sampling methods were first implemented in October 2017 following the removal of dedicated pumps from the monitoring wells. The purge rates from October 2024 are

compared to baseline purge rates from October 2017 in Table 4a. The October 2024 purge rates are consistent with proper well function.

3.4 Conclusions

Based on this evaluation, the monitoring well network is performing adequately and can provide data usable in assessing the groundwater flow and groundwater quality near the site. No changes are recommended for the monitoring well network.

4.0 Groundwater Monitoring Stages and Statistical Methods

Historically, groundwater results from the downgradient wells were compared to upper control limits calculated as the mean plus two standard deviations of the upgradient (background) well results, as required by the closure permit (Section X, Paragraph 4[n]) and specified in 567 IAC 115.26(6) [2].

Although the control limit calculation methods are still specified in the closure permit and 567 IAC 115, the IDNR recommended in their 2020 AWQR response letter that "more aggressive statistics" be implemented to evaluate the groundwater results. For statistical method examples, the IDNR letter referred to the U.S. Environmental Protection Agency Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (USEPA, 2009) and the municipal solid waste regulations under IAC 567—113.10(455B).

The USEPA Unified Guidance provides statistical methods for the following stages of monitoring: detection monitoring, assessment monitoring, and corrective action monitoring. During detection monitoring, if at least one parameter indicates a statistically significant increase (SSI) above background levels, the facility moves into compliance/assessment monitoring. Compliance/assessment monitoring is intended to assess the extent of contamination and evaluate compliance with groundwater protection standards (GWPS). If groundwater results indicate a statistically significant level (SSL) above a GWPS, the facility is subject to corrective action and monitoring is used to track the progress of remedial activities.

As of the 2021 AWQR, the evaluation of groundwater results at this site was revised to follow the stages of monitoring outlined in the USEPA Unified Guidance. Additionally, the statistical methods used for establishing background levels were updated starting with the 2021 Annual Report, as described below. Background levels and groundwater protection standards (GWPS) are presented in Table 5.

4.1 Background Levels and Identification of SSIs

The background levels used for this 2024 Annual Report are based on groundwater results through October 2022, as described below and documented in the 2023 AWQR. Interwell background levels were developed based on the groundwater results from upgradient well MW-1. The USEPA Unified Guidance recommends using a minimum of 8 to 10 independent background samples temporarily until additional background sampling can be conducted and provides an overall recommendation to establish background sample sizes as large as feasible (USEPA, 2009). For most parameters, the most recent 20 results as of October 2022 were used to evaluate background levels. For metals, all available total metals results as of October 2022 were used, amounting to 11 rounds. The methods used to calculate background levels are noted in Table 5 and detailed documentation of the background level evaluation was provided in the 2023 AWQR. These background levels will be updated for the 2025 Annual Report, after two years of use. Background levels will be established for the new parameters added in Fall 2023 once a minimum of 8 to 10 independent background sample results are available, per the USEPA Unified Guidance (USEPA, 2009).

[2] Field measurements of pH were compared to both upper and lower control limits, calculated as the mean plus or minus two standard deviations, respectively, of the upgradient well measurements.

The background levels are used for direct comparison of the results from the two downgradient monitoring wells (MW-2 and MW-3). If a downgradient result exceeds the background value, resampling may be conducted to confirm the exceedance as a statistically significant increase (SSI) above background. The proposed resampling scheme is a 1-of-2 plan, meaning that a groundwater result above background will qualify as an SSI if the next sample result also exceeds the background level. If the resampling result is below the background level, the original exceedance of background is not considered an SSI. If the downgradient result exceeding the background value is within its normal range, resampling is not required. Per a conversation with the IDNR in December 2021, if the result exceeding background is suspected to be due to sampling error or lab error, resampling must be conducted within 90 days of the original sampling. If the exceedance is not thought to be due to such an error, the result from the next semiannual sampling event may be used to confirm or disconfirm the exceedance as an SSI.

4.2 Groundwater Protection Standards and Identification of SSLs

The groundwater protection standards applicable to the site are MCLs, if established, or Iowa's statewide standards for protected groundwater sources. GWPS are established for seven constituents in the monitoring program as of Fall 2023: fluoride, ammonia, nitrate, barium, lithium, molybdenum, and boron. The GWPS for these constituents are summarized in Table 5 and are greater than the background levels for the parameters with established background levels. Graphs of the background levels and groundwater protection standards are provided in Appendix C for the parameters with established background levels.

If an SSI is identified for a constituent for which a GWPS is established, additional evaluation must be conducted to determine whether the constituent is detected at a statistically significant level (SSL) above the GWPS. If no individual results for that constituent and well exceed the GWPS, then further statistical evaluation is not required. If at least one individual result exceeds the GWPS, the lower confidence limit of the data must be calculated and compared to the GWPS. If the lower confidence limit of the result is greater than the GWPS, the result is considered to be an SSL and the facility may be subject to corrective action.

5.0 Leachate Collection System Performance Evaluation

5.1 Monthly Monitoring Procedures

Origin Design (formerly known as IIW, P.C.) of Dubuque, Iowa completes monthly monitoring of the landfill's leachate collection system, including measurements of leachate discharge volume, flow rates, and leachate levels in the Stage 1 and Stage 2 leachate standpipes.

During the 2023 reporting period, TRC worked with Origin Design to gain a better understanding of the leachate collection system maintenance and monthly monitoring procedures performed. As a result, several changes were made to the monthly leachate collection system monitoring protocols and data collection during the 2023 reporting period, as summarized below:

- **Leachate levels in standpipes**
  - The leachate standpipes are an extension of the leachate collection system and are not able to be used for measuring the head of leachate on the liner. When the leachate valves are turned off and leachate is allowed to back up in the standpipes and levels equilibrate, the elevation of the leachate in the standpipe is understood to reflect the elevation of the saturated waste and is now recorded as such on the monthly monitoring forms. (These measurements were previously recorded as leachate elevations and were used to calculate reported head on liner, but they do not actually represent the leachate head on the liner.)
  - It was recommended that the leachate valves be turned off the day prior to measuring the leachate levels in the standpipes ("elevation of saturated waste" measurements) to allow sufficient time for levels to equilibrate. In addition, it was recommended that equilibration of the leachate levels be confirmed prior to recording a measurement. These changes were implemented by July 2023.
- **Underliner flow rates:** Starting in June 2023, monthly flow measurements were also made for the underliner drain line flow rates in Stage 1 and Stage 2, both while the leachate valves were open and after they had been closed the day prior.

5.2 System Conditions

Existing known issues with the leachate collection system include:

- A blockage is present within the Stage 1 standpipe at a depth of approximately 80-81 feet below the top of the standpipe. Based on televising of the standpipe performed on April 11, 2023, by Superior Jetting, Inc., the blockage appeared to be gravel, which is thought to be gravel used as the gravel pack around the standpipe, presumably which has entered the standpipe by way of a breach in the standpipe. Future jetting of the Stage 1 standpipe is not recommended due to this potential for additional damage to occur to the standpipe.
- "Debris or damaged pipe" was noted in the Stage 1 leachate drain line during the video inspection on April 11, 2023.

5.3 System Maintenance

Leachate collection system maintenance performed during the 2024 reporting period is summarized below. Televising was not performed during the 2024 reporting period.

- March 26, 2024: Jetting of the Stage 1 and Stage 2 leachate drains.
- August 19, 2024: Jetting of the Stage 2 vertical standpipe and the Stage 1 and Stage 2 leachate drains, as well as approximately halfway down the Stage 1 vertical standpipe.

5.4 System Monitoring Results

The monthly elevations of saturated waste, leachate drain line flow rates, and underliner drain line flow rates are summarized in Table 12. The leachate monitoring data is also presented with the total monthly precipitation on the graphs in Appendix G.

The monthly volume of leachate pumped to the NPDES Outfall #008 is summarized in Table 12. A total of approximately 1,603,084 gallons were discharged between October 2023 and October 2024, which equates to an annual average discharge rate of approximately 3.2 gpm.

The elevation of saturated waste in Stage 1 was below the obstruction during November 2023 through April 2024, but was above the obstruction for the rest of the monitoring period. The increase in the elevation of saturated waste may be correlated to a period of higher precipitation starting in April 2024. The Stage 1 leachate flow rate was also relatively low during November 2023 through April 2024, then increased between April and August 2024, which may also be correlated with precipitation. The Stage 1 underliner flow rates were generally similar whether measured with the leachate valve open or closed, with the exception of measurements in July, September, and October 2024, when the underliner flow rate was higher after the leachate valves were closed. The general similarity of the Stage 1 underliner flow rates whether the leachate valves are open or closed may be considered indicative of a lack of connection between the leachate and underliner drain systems.

The elevation of saturated waste measurements for Stage 2 fluctuated throughout the year and do not appear to correlate with precipitation. The Stage 2 leachate flow rates were fairly consistent during the monitoring period and also do not appear to correlate with precipitation. Consistent with previous observations, the Stage 2 underliner drain line did not have any observed flow while the leachate drain valve was open (as during normal operating conditions), but did have flow when the leachate valve was closed. The Stage 2 underliner flow rates measured when the leachate valve was closed were relatively low during November 2023 through April 2024 (0.14 to 0.24 gpm), then higher during May 2024 through October 2024 (0.83 to 1.15 gpm). The presence of flow in the underliner drain line only when the leachate valve is closed may indicate a connection between the underdrain and leachate collection system. However, regardless of the valve setting, it appears that both leachate and underliner liquid are being effectively collected. Note that the leachate valves are typically open during normal operating conditions, and the underliner drain lines were designed to be a secondary leachate collection system for the landfill.

5.5 Conclusions and Recommendations

Based on the results of current and historical studies and monthly system monitoring, the leachate collection system meets the requirements in the facility closure permit and 567 IAC 115.26 (12)(b)(2).

Routine video inspection (televising) of the Stage 1 and Stage 2 standpipes is recommended to be completed annually to identify potential blockages and/or structural issues. Televising of the remainder of the system (leachate drain lines and underliner drain lines) and jetting is recommended as needed, such as if video inspection indicates debris or blockages or flow rates decrease significantly and are suspected to be due to blockages.

However, jetting is not recommended for the Stage 1 standpipe due to the potential that additional jetting may impact the structural integrity of the standpipe.

6.0 Groundwater and Leachate System Sampling and Results

6.1 Groundwater and Leachate Sampling

Semiannual groundwater and leachate sampling was completed at the JDDW Landfill in the Spring and Fall of 2024 by TRC. The Spring sampling was completed during April 11 and 12, 2024, and the Fall sampling was completed during October 28 and 29, 2024. The groundwater and leachate sampling forms for both semiannual sampling events are included in Appendix B. Samples were analyzed by Eurofins Cedar Falls. The laboratory reports are included in Appendix D. Summary tables of results for each monitoring point sampled historically are included in Tables 9a through 9e, and a summary of the results from 2024 is included in Table 9f. Graphs of the groundwater results for the historical parameters are included in Appendix E.

6.2 Quality Assurance/Quality Control Summary

TRC completed a limited data validation of the laboratory results for the groundwater samples, leachate samples, and equipment blanks collected during the semiannual sampling events. The data were found to be usable with qualification, as described in the data validation reviews (Appendix F).

Samples collected for quality assurance and quality control included one duplicate sample and one equipment blank for each semiannual sampling event. The April and October 2024 duplicate samples were collected from MW-2. An equipment blank was collected during both sampling events to assess whether pump decontamination procedures between wells was adequate. Target analytes were not detected in the equipment blank samples.

6.2.1 Turbidity

Following review of the 2020 AWQR, the IDNR requested that turbidity measurements be included in future reports and requested an evaluation of the effect that turbidity may have on metals results that exceed background. During both semiannual sampling events, turbidity measurements were made for each groundwater sample using a turbidity meter, and visual observations of turbidity were also recorded on the groundwater sampling field forms (Appendix B). No visual turbidity was observed for the groundwater samples collected in April or October 2024. Sample turbidity measurements from April and October 2024 indicated low turbidity values ranging from 1.64 to 8.05 nephelometric turbidity units (NTU).

The metals in the monitoring program with established background levels include total barium, total iron, and total magnesium. Of these constituents, only total magnesium in MW-3 has routinely been detected at concentrations greater than the background level. Given that the results for total and dissolved magnesium in MW-3 are generally similar, including during the five rounds of monitoring when both dissolved and total magnesium were analyzed, it is unlikely that turbidity has a significant effect on the magnesium results.

6.3 Groundwater Results

6.3.1 Exceedances of Background Without Immediately Preceding SSIs

There were two exceedances of background levels without immediately preceding SSIs during the reporting period: chloride in MW-2 in April 2024, and specific conductance in MW-2 in October 2024. The chloride background exceedance in MW-2 in April 2024 was not confirmed as an SSI by the October 2024 sampling. Table 6 provides a summary of constituents detected or measured in the most recent sampling event (October 2024) that do not have immediately preceding SSIs.

6.3.2 SSIs

Table 7 summarizes the SSIs identified during the most recent sampling event (October 2024). A summary of the historic SSIs starting in 2021 is shown in Table 10. Due to the change in statistical methods starting with the 2021 AWQR, SSIs were not evaluated for prior to 2021. The SSIs identified in October 2024 include the following constituents:

- Chloride (MW-3)
- Nitrate (MW-2 and MW-3)
- Total magnesium (MW-3)
- Specific conductance (MW-3)

The concentrations of these constituents are generally consistent with results from recent years (see concentration vs. time graphs in Appendix E). Of the constituents with SSIs in 2024, only nitrate has an applicable health-based GWPS (MCL or statewide standard). The nitrate results do not exceed the health-based GWPS, so calculation of a lower confidence limit is not necessary. Due to the identified SSIs, wells MW-2 and MW-3 are still considered to be in assessment monitoring.

6.3.3 SSLs

No SSLs above GWPS were identified during the 2024 sampling events.

6.3.4 Phenols and VOCs

The Closure Permit requires annual sampling for total phenols and sampling every five years for VOCs.[3] Samples were most recently collected for total phenols during the October 2024 event and for VOCs during the October 2023 event. Neither VOCs nor phenols were detected in the monitoring wells or in the leachate when sampled most recently. The absence of VOCs and phenols in groundwater and leachate continues to support the conceptual model that these are not constituents of concern from the waste disposed in the landfill.

[3] VOCs were sampled for in 2023 and are due to be sampled again in 2028.

6.3.5 Parameters Added in October 2023

As discussed previously, the following parameters were added to the monitoring program in Fall 2023, as required by the updated Closure Permit (IDNR, 2023): sulfate, TDS, boron (total), calcium (total), lithium (total), and molybdenum (total). Groundwater sample results from the 2024 sampling are included in Table 9f along with the 2024 sample results from the leachate collection system and underliner drains. Groundwater results for these newer parameters were below the GWPS, where applicable. Sulfate, TDS, and calcium were detected in groundwater samples from each of the three monitoring wells. GWPS are not established for these parameters. Boron was detected in MW-3 at a concentration below the GWPS and was not detected in MW-1 or MW-2. Lithium and molybdenum were not detected in the groundwater samples. The concentrations of sulfate, TDS, and boron detected in MW-3 appear to be elevated relative to background (MW-1) concentrations.

6.4 Discussion of Leachate, Underliner, and Groundwater Results

A discussion of groundwater, leachate, and underliner results is provided below. The 2024 sample results for leachate, underliner, and groundwater are summarized in Table 9f.

The results for leachate and underliner samples collected from the same stage are generally similar for most parameters, which indicates that the underliner liquid from each stage is primarily composed of leachate from that stage. Additionally, the Stage 1 underliner sample results were generally similar for most parameters whether the leachate valves were open (allowing leachate to drain freely) or closed (causing leachate to back up in the collection system), indicating that the composition of the Stage 1 underliner liquid does not vary much based on whether the leachate is draining freely. Because the Stage 2 underliner drain typically does not have any flow during normal operating conditions (leachate valves open and leachate draining freely), the Stage 2 underliner has only been sampled after the leachate valves have been closed.

In general, higher concentrations of the target analytes were detected in the Stage 2 leachate and underliner samples than in the Stage 1 leachate or underliner samples, including analytes indicative of fly ash such as sulfate and boron.

Groundwater results from MW-3 included SSIs for several parameters in 2024, including chloride, nitrate, magnesium, and specific conductance. Additionally, several of the parameters added in Fall 2023 were detected in MW-3 at concentrations higher than those from upgradient well MW-1 (for example, TDS, boron, and sulfate); however, background levels have not yet been established for these newer parameters. In general, the parameters detected at elevated levels in MW-3 are also present in the landfill leachate and underliner samples at higher concentrations. For example, boron was detected at concentrations of approximately 2.3 mg/L in MW-3 in 2024, compared to concentrations of approximately 22 mg/L in the Stage 2 leachate and underliner samples.

Groundwater results from MW-2 have indicated SSIs for nitrate since Fall 2022. No other SSIs were detected for MW-2 during the 2024 reporting period. Given that nitrate is the only SSI observed for MW-2, nitrate levels in MW-2 are higher than those in MW-3 despite MW-3 having generally higher concentrations of other parameters, and results for other analytes in MW-2 do not seem to be indicative of impacts from the landfill (for example, boron was not detected and sulfate concentrations were lower than those in background well MW-1), the elevated levels of nitrate may be due to a source other than the landfill fill materials.

6.5 Conclusions and Recommendations

The results of the semi-annual monitoring and inspection indicate that the landfill monitoring network continues to provide usable data. Groundwater results are below the GWPS for the parameters for which they are established. Most constituents detected at elevated concentrations in groundwater from downgradient monitoring well MW-3 are consistent with those reported in the leachate and underliner samples. The elevated nitrate concentrations detected in MW-2 may be related to a source other than the landfill fill materials. No changes to monitoring are proposed at this time.

7.0 References

IIW, P.C. 2012. John Deere Dubuque Works Sanitary Landfill Closure Compliance Report. November 13.

Iowa Department of Natural Resources (IDNR). 2023. Sanitary Disposal Project Closure Permit, Permit Number 31-SDP-01-75C. August 17 (revised issuance date for Amendment #5).

James Montgomery and Associates (JMA). 1990. Hydrogeological Investigation at the John Deere Dubuque Works Sanitary Landfill. February.

U. S. Environmental Protection Agency (USEPA). 2009. Statistical Analysis of Groundwater Monitoring at RCRA Facilities Unified Guidance. EPA 530/R-09-007. March.

Table 1: Monitoring Program Summary
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Monitoring Well	Formation	Current Monitoring Program	Change for Next Sampling Event	Constituents w/ SSI during Reporting Period	Constituents w/ SSL during Reporting Period	Total # of Samples in Each Monitoring Program Starting April 2021[(1)]		
						Detection	Assessment	Corrective Action
MW-1	Dolomite with shale	Background	-	-	-	-	-	-
MW-2	Dolomite with shale	Assessment	-	Nitrate as nitrogen	-	1	7	0
MW 3	Dolomite with shale	Assessment	-	Chloride, nitrate as nitrogen, total magnesium, specific conductance	-	1	7	0

Notes:

Updated by: L. Auner, 12/30/2024

Checked by: M. Holicky 1/9/2025

SSI = statistically significant increase above background level

SSL = statistically significant level above groundwater protection standard

- = None or not applicable

Footnotes:

1. The total # of samples in each monitoring program includes only the results since April 2021 as they are the first results evaluated using the updated statistical methods.

Table 2: Monitoring Program Implementation Schedule
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Monitoring Well	Recent Sampling Dates and Constituents			Upcoming Sampling Dates and Constituents		Volatile Organic Compounds (VOCs)	
	October 2023	April 2024	October 2024	April 2025	October 2025	Previously Collected	Next Event
MW-1	List A+B, total phenols, VOCs	List A+B	List A+B, total phenols	List A+B	List A+B, total phenols	October 2023	October 2028
MW-2	List A+B, total phenols, VOCs	List A+B	List A+B, total phenols	List A+B	List A+B, total phenols	October 2023	October 2028
MW-3	List A+B, total phenols, VOCs	List A+B	List A+B, total phenols	List A+B	List A+B, total phenols	October 2023	October 2028

Notes:

Updated by: L. Auner, 12/30/2024

Checked by: E. Lawson, 1/16/2025

List A (semi-annual): ammonia as nitrogen, total barium, chemical oxygen demand, chloride, conductivity, fluoride, total iron, total magnesium, nitrates as nitrogen, pH, temperature, turbidity

List B (additional parameters per IDNR request, starting in October 2023): sulfate, total dissolved solids, total boron, total calcium, total lithium, total molybdenum

Table 3: Monitoring Well Maintenance and Performance Reevaluation Schedule
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Compliance with:	Monitoring Calendar Years				
	2023	2024	2025	2026	2027
Monthly water level measurements (Closure Permit, Section X, Paragraph 4[i])	Completed	Completed	Scheduled	Scheduled	Scheduled
567 IAC 115.21(2)"a" high and low water levels (biennial)	Completed	Completed	Scheduled	Scheduled[1]	Scheduled
567 IAC 115.21(2)"b" changes in the hydrologic setting and flow paths (biennial)	Completed	Completed	Scheduled	Scheduled[1]	Scheduled
567 IAC 115.21(2)"c" well depths (annual)	Completed	Completed	Scheduled	Scheduled	Scheduled
Documentation of purge rates during low flow sampling (Closure Permit, Section X, Paragraph 4[m])	Completed	Completed	Scheduled	Scheduled	Scheduled

Footnotes:

1. Evaluation of high and low water levels and changes in the hydrologic setting and flow paths are only required biennially; however, these are typically evaluated annually.

Updated by: L. Auner, 12/30/2024
Checked by: E. Lawson, 1/16/2025

Table 4a: Monitoring Well Maintenance and Performance Summary
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Well Construction Information				Description	Date of Measurements		Maximum Depth Discrepancy (ft)	Low Flow Sampling Purge Rate Comparison		
	Top of Casing Elevation (ft MSL)[1]	Top of Screen Elevation (ft MSL)[2]	Bottom of Screen Elevation (ft MSL)[2]	Total Depth (ft btoc)[3]		4/11/2024	10/28/2024		Baseline Purge Rate (mL/min), 10/16/2017	Most Recent Purge Rate (mL/min), 10/28/2024	% Change
MW-1	842.05	673.27	643.27	198.78	Depth to Water (ft btoc)	134.83	134.91	0.02	125	150	9%
					Groundwater Elevation (ft MSL)	707.22	707.14				
					Depth to Bottom (ft btoc)	198.80	198.78				
					Submerged Screen (Y/N)	Y	Y				
MW-2	848.49	681.77	651.77	196.72	Depth to Water (ft btoc)	150.6	151.31	0.00	115	150	13%
					Groundwater Elevation (ft MSL)	697.89	697.18				
					Depth to Bottom (ft btoc)	196.72	196.72				
					Submerged Screen (Y/N)	Y	Y				
MW-3	774.06	677.00	647.00	127.06	Depth to Water (ft btoc)	75.14	74.16	0.02	200	250	11%
					Groundwater Elevation (ft MSL)	698.92	699.90				
					Depth to Bottom (ft btoc)	127.08	127.06				
					Submerged Screen (Y/N)	Y	Y				

Notes:

ft MSL = feet above mean sea level

Y/N = Yes/No

Updated by: L. Auner, 12/30/2024

Checked by: M. Holicky 1/9/2025

Footnotes:

1. Top of casing elevations were resurveyed on 9/26/2023.
2. Top and bottom of screen elevations were adjusted based on 9/26/2023 top of casing surveyed elevations (assuming total depth of well and screen length has not changed).
3. Total well depths assumed to be the same as prior to 9/26/2023 resurvey.

Table 4b: Monthly Groundwater Elevation Measurements
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
10/16/1991	132.85	711.82	147.92	700.85	72.45	701.60
11/13/1991	132.72	711.95	147.83	700.94	73.64	700.41
12/18/1991	132.86	711.81	147.93	700.84	74.26	699.79
1/15/1992	132.61	712.06	147.63	701.14	73.52	700.53
2/12/1992	132.77	711.90	147.76	701.01	73.61	700.44
3/21/1992	132.73	711.94	147.71	701.06	73.56	700.49
4/15/1992	132.62	712.05	148.39	700.38	74.02	700.03
5/15/1992	132.79	711.88	148.56	700.21	74.16	699.89
6/11/1992	132.87	711.80	148.75	700.02	74.29	699.76
7/17/1992	132.39	712.28	148.77	700.00	74.11	699.94
8/22/1992	132.75	711.92	149.06	699.71	74.25	699.80
9/23/1992	132.96	711.71	149.14	699.63	75.25	698.80
10/8/1992	132.73	711.94	149.14	699.63	74.06	699.99
11/17/1992	133.02	711.65	148.76	700.01	74.09	699.96
12/26/1992	133.28	711.39	148.92	699.85	74.23	699.82
1/19/1993	133.47	711.20	149.10	699.67	74.36	699.69
2/19/1993	133.43	711.24	148.98	699.79	74.30	699.75
3/19/1993	133.56	711.11	141.25	707.52	74.50	699.55
4/8/1993	134.16	710.51	149.66	699.11	74.87	699.18
5/15/1993	133.55	711.12	149.25	699.52	74.66	699.39
6/16/1993	133.54	711.13	149.35	699.42	74.75	699.30
7/9/1993	133.65	711.02	149.52	699.25	74.76	699.29
8/20/1993	133.71	710.96	149.73	699.04	74.74	699.31
9/10/1993	133.83	710.84	149.78	698.99	74.75	699.30
10/14/1993	134.29	710.38	150.11	698.66	75.01	699.04
4/13/1994	134.55	710.12	150.30	698.47	75.16	698.89
9/15/1994	133.75	710.92	149.65	699.12	74.71	699.34
3/16/1995	133.67	711.00	148.96	699.81	74.26	699.79
9/14/1995	133.16	711.51	148.87	699.90	73.71	700.34
3/16/1996	133.51	711.16	149.03	699.74	74.03	700.02
9/17/1996	133.15	711.52	148.82	699.95	74.10	699.95
3/21/1997	134.33	710.34	150.22	698.55	75.20	698.85
9/18/1997	133.70	710.97	150.49	698.28	75.08	698.97
10/15/1997	133.28	711.39	150.07	698.70	74.93	699.12
10/31/1997	133.54	711.13	150.32	698.45	75.07	698.98
12/13/1997	133.34	711.33	149.90	698.87	75.00	699.05
1/14/1998	133.91	710.76	150.33	698.44	75.29	698.76
2/20/1998	134.20	710.47	150.48	698.29	75.35	698.70
3/19/1998	134.22	710.45	150.42	698.35	75.30	698.75
4/15/1998	134.02	710.65	150.13	698.64	75.05	699.00
5/14/1998	134.25	710.42	150.29	698.48	75.15	698.90
6/17/1998	134.40	710.27	150.51	698.26	75.28	698.77
7/17/1998	134.05	710.62	150.47	698.30	75.16	698.89
8/22/1998	133.98	710.69	150.48	698.29	75.02	699.03
9/22/1998	133.97	710.70	150.47	698.30	74.91	699.14
10/14/1998	133.11	711.56	149.98	698.79	74.60	699.45
11/6/1998	132.95	711.72	149.87	698.90	74.55	699.50
12/17/1998	133.65	711.02	149.55	699.22	74.17	699.88
1/13/1999	134.33	710.34	150.00	698.77	74.45	699.60
2/13/1999	134.23	710.44	149.82	698.95	74.40	699.65
3/13/1999	134.32	710.35	149.87	698.90	74.45	699.60

Table 4b: Monthly Groundwater Elevation Measurements
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
4/14/1999	133.75	710.92	149.40	699.37	74.21	699.84
5/14/1999	134.18	710.49	149.78	698.99	74.50	699.55
6/11/1999	134.10	710.57	149.78	698.99	74.48	699.57
7/13/1999	134.25	710.42	149.96	698.81	74.65	699.40
8/14/1999	134.35	710.32	150.10	698.67	74.75	699.30
9/14/1999	134.38	710.29	150.22	698.55	74.81	699.24
10/28/1999	133.70	710.97	149.88	698.89	74.62	699.43
11/13/1999	133.86	710.81	149.90	698.87	74.69	699.36
12/14/1999	133.70	710.97	149.85	698.92	74.60	699.45
1/14/2000	134.22	710.45	150.26	698.51	74.91	699.14
2/16/2000	134.20	710.47	150.40	698.37	75.05	699.00
3/15/2000	134.36	710.31	150.31	698.46	74.95	699.10
4/11/2000	134.09	710.58	150.23	698.54	75.01	699.04
5/12/2000	133.91	710.76	150.13	698.64	74.86	699.19
6/6/2000	133.85	710.82	150.16	698.61	74.86	699.19
7/19/2000	133.38	711.29	150.08	698.69	74.51	699.54
8/22/2000	133.18	711.49	149.82	698.95	74.15	699.90
9/21/2000	133.26	711.41	149.61	699.16	73.98	700.07
10/25/2000	132.53	712.14	149.03	699.74	73.70	700.35
11/11/2000	132.79	711.88	149.08	699.69	73.81	700.24
11/16/2000	132.40	712.27	148.83	699.94	73.61	700.44
12/16/2000	132.85	711.82	148.94	699.83	73.78	700.27
2/21/2001	133.22	711.45	149.02	699.75	73.93	700.12
3/14/2001	133.40	711.27	149.07	699.70	73.98	700.07
5/16/2001	132.91	711.76	148.83	699.94	73.96	700.09
6/15/2001	133.30	711.37	149.11	699.66	74.14	699.91
8/24/2001	133.42	711.25	149.01	699.76	74.33	699.72
9/22/2001	133.76	710.91	149.29	699.48	74.53	699.52
11/20/2001	133.61	711.06	149.30	699.47	74.47	699.58
12/12/2001	134.08	710.59	149.67	699.10	74.70	699.35
1/18/2002	133.48	711.19	149.18	699.59	74.93	699.12
2/21/2002	134.29	710.38	149.98	698.79	74.83	699.22
3/21/2002	134.29	710.38	150.06	698.71	75.03	699.02
4/17/2002	134.28	710.39	149.99	698.78	74.95	699.10
5/18/2002	134.44	710.23	150.27	698.50	75.10	698.95
6/18/2002	134.69	709.98	150.53	698.24	75.23	698.82
7/18/2002	134.94	709.73	150.71	698.06	75.34	698.71
8/22/2002	135.06	709.61	150.86	697.91	75.44	698.61
9/18/2002	135.09	709.58	151.06	697.71	75.55	698.50
10/17/2002	134.78	709.89	150.75	698.02	75.46	698.59
11/15/2002	134.81	709.86	150.72	698.05	75.44	698.61
12/13/2002	134.68	709.99	150.59	698.18	75.31	698.74
1/23/2003	135.42	709.25	151.09	697.68	75.72	698.33
2/20/2003	135.51	709.16	151.17	697.60	75.71	698.34
3/19/2003	135.72	708.95	151.43	697.34	75.92	698.13
4/18/2003	135.58	709.09	151.38	697.39	75.87	698.18
5/23/2003	135.59	709.08	151.44	697.33	75.77	698.28
6/18/2003	135.68	708.99	151.60	697.17	75.82	698.23
7/19/2003	135.89	708.78	151.82	696.95	75.92	698.13
8/15/2003	135.78	708.89	151.76	697.01	75.87	698.18
9/18/2003	135.77	708.90	151.77	697.00	75.79	698.26

Table 4b: Monthly Groundwater Elevation Measurements
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	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
10/23/2003	135.32	709.35	151.41	697.36	75.69	698.36
11/14/2003	135.10	709.57	151.24	697.53	75.50	698.55
12/17/2003	134.74	709.93	150.80	697.97	75.16	698.89
1/14/2004	134.98	709.69	150.86	697.91	75.11	698.94
2/4/2004	134.95	709.72	150.91	697.86	75.19	698.86
3/12/2004	134.16	710.51	150.35	698.42	74.79	699.26
4/20/2004	133.63	711.04	150.20	698.57	73.92	700.13
5/20/2004	131.82	712.85	149.19	699.58	71.54	702.51
6/16/2004	130.53	714.14	148.02	700.75	70.59	703.46
7/13/2004	128.58	716.09	145.72	703.05	69.91	704.14
8/11/2004	127.89	716.78	144.73	704.04	70.06	703.99
9/17/2004	127.95	716.72	144.77	704.00	70.47	703.58
10/23/2004	127.06	717.61	144.43	704.34	70.36	703.69
11/19/2004	127.47	717.20	144.83	703.94	70.55	703.50
12/15/2004	127.80	716.87	145.01	703.76	70.49	703.56
1/21/2005	127.93	716.74	145.33	703.44	70.59	703.46
2/19/2005	128.65	716.02	146.04	702.73	71.02	703.03
3/16/2005	127.83	716.84	145.71	703.06	70.91	703.14
4/2/2005	128.02	716.65	145.95	702.82	71.10	702.95
5/6/2005	127.99	716.68	146.02	702.75	71.22	702.83
6/3/2005	128.69	715.98	146.49	702.28	71.52	702.53
7/14/2005	128.96	715.71	146.69	702.08	71.56	702.49
8/12/2005	129.45	715.22	147.11	701.66	71.87	702.18
9/9/2005	129.67	715.00	147.37	701.40	72.03	702.02
10/23/2005	129.24	715.43	147.03	701.74	71.90	702.15
11/10/2005	129.61	715.06	147.27	701.50	72.04	702.01
12/2/2005	129.50	715.17	147.19	701.58	71.81	702.24
1/14/2006	130.03	714.64	147.46	701.31	71.90	702.15
2/10/2006	130.03	714.64	147.36	701.41	71.70	702.35
3/4/2006	130.24	714.43	147.49	701.28	71.85	702.20
4/6/2006	129.88	714.79	147.09	701.68	71.50	702.55
5/25/2006	130.09	714.58	146.36	702.41	70.99	703.06
6/22/2006	128.71	715.96	146.01	702.76	70.73	703.32
7/14/2006	128.38	716.29	145.72	703.05	70.63	703.42
8/12/2006	127.28	717.39	144.89	703.88	69.69	704.36
9/9/2006	127.88	716.79	144.35	704.42	69.71	704.34
10/12/2006	126.83	717.84	144.32	704.45	70.08	703.97
11/11/2006	126.41	718.26	144.04	704.73	69.35	704.70
12/8/2006	126.22	718.45	143.88	704.89	69.95	704.10
1/13/2007	127.56	717.11	144.47	704.30	70.43	703.62
2/13/2007	127.45	717.22	145.13	703.64	70.80	703.25
3/15/2007	127.64	717.03	145.34	703.43	70.72	703.33
4/13/2007	128.18	716.49	145.90	702.87	70.98	703.07
5/12/2007	127.09	717.58	145.58	703.19	70.76	703.29
6/5/2007	127.30	717.37	145.73	703.04	70.74	703.31
7/14/2007	127.89	716.78	146.31	702.46	71.05	703.00
8/10/2007	128.25	716.42	146.63	702.14	71.20	702.85
9/7/2007	129.18	715.49	147.53	701.24	71.90	702.15
10/6/2007	128.42	716.25	146.73	702.04	71.12	702.93
11/9/2007	128.12	716.55	146.13	702.64	71.05	703.00
12/7/2007	128.46	716.21	146.35	702.42	71.21	702.84

Table 4b: Monthly Groundwater Elevation Measurements
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
1/4/2008	128.55	716.12	146.32	702.45	71.25	702.80
1/31/2008	129.14	715.53	146.83	701.94	71.51	702.54
3/13/2008	129.21	715.46	146.82	701.95	71.43	702.62
4/11/2008	128.93	715.74	146.52	702.25	71.62	702.43
5/14/2008	129.11	715.56	146.67	702.10	71.69	702.36
6/25/2008	129.78	714.89	147.21	701.56	72.06	701.99
7/17/2008	129.95	714.72	147.30	701.47	72.09	701.96
8/14/2008	130.28	714.39	147.53	701.24	72.28	701.77
9/13/2008	130.73	713.94	147.87	700.90	72.62	701.43
10/15/2008	130.03	714.64	147.09	701.68	72.22	701.83
11/26/2008	130.95	713.72	147.77	701.00	72.91	701.14
12/20/2008	131.40	713.27	148.23	700.54	73.24	700.81
1/17/2009	131.17	713.50	147.93	700.84	73.07	700.98
2/17/2009	131.23	713.44	148.11	700.66	73.22	700.83
3/27/2009	132.18	712.49	148.81	699.96	73.71	700.34
4/19/2009	131.94	712.73	148.53	700.24	73.83	700.22
5/19/2009	131.39	713.28	148.05	700.72	71.48	702.57
6/16/2009	131.67	713.00	148.25	700.52	71.68	702.37
7/18/2009	131.51	713.16	148.26	700.51	71.51	702.54
8/21/2009	131.84	712.83	148.63	700.14	72.16	701.89
9/15/2009	132.16	712.51	148.79	699.98	72.55	701.50
10/27/2009	131.84	712.83	148.43	700.34	72.87	701.18
11/27/2013	131.95	712.72	148.48	700.29	73.02	701.03
12/18/2013	132.51	712.16	148.97	699.80	73.53	700.52
1/24/2014	132.78	711.89	149.23	699.54	73.74	700.31
2/26/2014	132.24	712.43	148.75	700.02	73.61	700.44
3/26/2014	132.42	712.25	148.80	699.97	73.60	700.45
4/22/2014	132.42	712.25	148.80	699.97	73.60	700.45
5/21/2014	132.47	712.20	148.85	699.92	73.31	700.74
6/20/2014	132.76	711.91	149.06	699.71	73.50	700.55
7/24/2014	132.92	711.75	149.29	699.48	72.79	701.26
8/27/2014	132.93	711.74	149.31	699.46	72.96	701.09
9/24/2014	132.97	711.70	149.35	699.42	73.21	700.84
10/23/2014	132.41	712.26	148.80	699.97	73.32	700.73
11/12/2014	132.92	711.75	149.12	699.65	73.65	700.40
12/9/2014	132.93	711.74	149.16	699.61	73.73	700.32
1/20/2015	132.93	711.74	149.20	699.57	73.80	700.25
2/25/2015	132.83	711.84	149.04	699.73	73.74	700.31
3/25/2015	133.21	711.46	149.48	699.29	74.08	699.97
4/23/2015	133.19	711.48	149.30	699.47	74.19	699.86
5/18/2015	133.38	711.29	149.37	699.40	74.26	699.79
6/26/2015	133.59	711.08	149.54	699.23	74.38	699.67
7/22/2015	133.78	710.89	149.73	699.04	74.48	699.57
8/26/2015	134.12	710.55	150.06	698.71	74.67	699.38
9/23/2015	134.27	710.40	150.17	698.60	74.73	699.32
10/20/2015	133.96	710.71	149.37	699.40	74.75	699.30
11/24/2015	134.47	710.20	149.74	699.03	75.07	698.98
12/7/2015	134.32	710.35	149.61	699.16	74.97	699.08
1/13/2016	134.32	710.35	149.61	699.16	74.97	699.08
2/24/2016	134.91	709.76	150.21	698.56	75.17	698.88
3/28/2016	134.98	709.69	150.38	698.39	74.91	699.14

Table 4b: Monthly Groundwater Elevation Measurements
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
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	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
4/27/2016	134.54	710.13	149.74	699.03	74.56	699.49
5/25/2016	134.62	710.05	149.76	699.01	74.48	699.57
6/21/2016	134.69	709.98	149.80	698.97	74.51	699.54
7/25/2016	134.78	709.89	149.86	698.91	74.57	699.48
8/22/2016	134.83	709.84	149.93	698.84	74.49	699.56
9/20/2016	134.74	709.93	149.85	698.92	74.41	699.64
10/24/2016	134.14	710.53	149.52	699.25	74.41	699.64
11/22/2017	134.05	710.60	149.08	699.67	73.73	700.30
12/22/2017	133.81	710.84	148.85	699.90	73.67	700.36
1/19/2018	133.49	711.16	148.65	700.10	73.59	700.44
2/22/2018	134.08	710.57	149.07	699.68	74.02	700.01
3/15/2018	133.65	711.00	148.91	699.84	73.90	700.13
4/25/2018	133.84	710.81	149.14	699.61	74.08	699.95
5/18/2018	133.84	710.81	149.19	699.56	74.15	699.88
6/20/2018	133.86	710.79	149.25	699.50	74.21	699.82
7/23/2018	133.92	710.73	149.44	699.31	74.32	699.71
8/20/2018	133.94	710.71	149.43	699.32	74.31	699.72
9/18/2018	134.04	710.61	149.65	699.10	74.19	699.84
10/18/2018	134.24	710.41	149.81	698.94	72.78	701.25
11/19/2018	133.52	711.13	149.16	699.59	72.27	701.76
12/17/2018	133.44	711.21	148.98	699.77	72.42	701.61
1/18/2019	133.26	711.39	148.73	700.02	72.63	701.40
2/18/2019	133.27	711.38	148.63	700.12	72.14	701.89
3/21/2019	133.45	711.20	147.92	700.83	71.28	702.75
4/18/2019	131.71	712.94	147.46	701.29	71.06	702.97
5/16/2019	131.42	713.23	147.16	701.59	70.95	703.08
6/20/2019	131.02	713.63	147.01	701.74	70.94	703.09
7/16/2019	130.80	713.85	146.83	701.92	70.89	703.14
8/12/2019	130.64	714.01	146.74	702.01	70.95	703.08
9/20/2019	130.52	714.13	146.80	701.95	71.05	702.98
10/22/2019	129.47	715.18	146.06	702.69	70.06	703.97
11/21/2019	128.71	715.94	145.18	703.57	70.18	703.85
12/18/2019	128.81	715.84	145.36	703.39	70.64	703.39
1/13/2020	128.45	716.20	145.32	703.43	70.61	703.42
2/18/2020	128.20	716.45	145.45	703.30	70.78	703.25
3/17/2020	128.09	716.56	145.48	703.27	70.70	703.33
4/16/2020	128.07	716.58	145.66	703.09	70.62	703.41
5/7/2020	127.66	716.99	145.41	703.34	70.43	703.60
6/11/2020	127.65	717.00	145.58	703.17	70.68	703.35
7/15/2020	127.11	717.54	145.28	703.47	70.31	703.72
8/21/2020	126.85	717.80	145.17	703.58	70.37	703.66
9/14/2020	127.19	717.46	145.46	703.29	70.60	703.43
10/21/2020	127.11	717.54	145.54	703.21	70.67	703.36
11/17/2020	127.79	716.86	146.07	702.68	71.01	703.02
12/16/2020	127.41	717.24	145.79	702.96	70.72	703.31
1/19/2021	128.04	716.61	146.32	702.43	70.71	703.32
2/16/2021	127.98	716.67	146.31	702.44	71.04	702.99
3/16/2021	128.12	716.53	146.49	702.26	71.06	702.97
4/27/2021	128.46	716.19	146.71	702.04	71.07	702.96
5/17/2021	128.81	715.84	147.00	701.75	71.27	702.76
6/14/2021	129.14	715.51	147.24	701.51	71.48	702.55

Table 4b: Monthly Groundwater Elevation Measurements
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

	MW-1		MW-2		MW-3	
Date	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)	Depth to Groundwater (ft)	Water Elevation (ft)
7/14/2021	129.34	715.31	147.26	701.49	71.54	702.49
8/13/2021	129.81	714.84	147.56	701.19	71.84	702.19
9/14/2021	129.74	714.91	147.47	701.28	71.84	702.19
10/11/2021	129.89	714.76	147.54	701.21	71.94	702.09
11/22/2021	130.56	714.09	148.06	700.69	72.54	701.49
12/13/2021	130.76	713.89	148.21	700.54	72.73	701.30
1/17/2022	130.63	714.02	148.13	700.62	72.70	701.33
2/15/2022	131.22	713.43	148.49	700.26	73.13	700.90
3/16/2022	131.17	713.48	148.46	700.29	73.14	700.89
4/28/2022	131.57	713.08	148.77	699.98	73.46	700.57
5/19/2022	131.48	713.17	148.71	700.04	73.41	700.62
6/13/2022	131.84	712.81	148.91	699.84	73.59	700.44
7/11/2022	131.89	712.76	149.01	699.74	73.68	700.35
8/22/2022	132.46	712.19	149.37	699.38	73.98	700.05
9/27/2022	132.70	711.95	149.58	699.17	73.17	700.86
10/31/2022	132.68	711.97	149.53	699.22	74.17	699.86
11/15/2022	133.04	711.61	149.77	698.98	74.38	699.65
12/8/2022	133.35	711.30	149.95	698.80	74.49	699.54
1/11/2023	133.16	711.49	149.88	698.87	74.47	699.56
2/15/2023	133.34	711.31	150.15	698.60	74.68	699.35
3/29/2023	133.97	710.68	150.49	698.26	74.84	699.19
4/18/2023	133.93	710.72	150.48	698.27	74.74	699.29
5/18/2023	133.93	710.72	150.43	698.32	74.73	699.30
6/20/2023	134.22	710.43	150.68	698.07	74.84	699.19
7/18/2023	134.30	710.35	150.69	698.06	74.86	699.17
8/18/2023	134.49	710.16	150.78	697.97	74.92	699.11
9/19/2023	134.50	710.15	150.77	697.98	74.92	699.11
10/20/2023	134.46	707.59	150.61	697.88	74.91	699.15
11/27/2023	134.88	707.17	150.95	697.54	75.20	698.86
12/20/2023	138.40	703.65	154.32	694.17	78.64	695.42
1/22/2024	138.40	703.65	154.35	694.14	78.59	695.47
2/15/2024	138.59	703.46	154.48	694.01	78.78	695.28
3/25/2024	138.31	703.74	154.25	694.24	78.65	695.41
4/22/2024	138.52	703.53	154.42	694.07	78.75	695.31
5/23/2024	135.31	706.74	151.20	697.29	78.56	695.50
6/10/2024	135.43	706.62	151.21	697.28	74.75	699.31
7/9/2024	135.28	706.77	151.18	697.31	74.45	699.61
8/28/2024	135.17	706.88	150.75	697.74	74.18	699.88
9/27/2024	134.92	707.13	150.36	698.13	74.15	699.91
10/7/2024	135.06	706.99	150.38	698.11	74.25	699.81
Average	132.33	711.98	148.74	699.98	73.27	700.77

Notes:

1. The monitoring wells were resurveyed 9/26/2023. The new top of casing elevations were used for groundwater elevation calculations starting in October 2023.
2. Depth to groundwater measurements from April 2019 to present are based on the monthly reports from IIW or Origin Design. The source of earlier measurements is not confirmed.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky, 1/9/2025

Table 5: Background and GWPS Summary
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Constituent Type	Constituent	Units	Background Data Set[1]					Background Level	Statistical Test for Background Level	GWPS	Source of GWPS[2]
			# Samples	# Detections	Min Detection	Max Detection	Mean Detection				
Field Parameters	pH	SU	20*	20	7.0	7.8	7.3	6.7 - 8.0	95% LPL - 95% UPL (k=8)	-	-
	Specific conductance	µmhos	20*	20	472	730	611	753.5	95% UPL (k=8)	-	-
Non-metal Inorganics	Chloride	mg/L	20	15	2.48	6.69	4.62	8.05	95% KM UPL (k=8)	-	-
	Fluoride	mg/L	20	5	0.101	0.251	0.1492	0.251	Max Detected	4	MCL
	Nitrate, as nitrogen	mg/L	20*	0	-	-	-	0.5	DQR at max PQL	10	MCL
	Sulfate	mg/L	--	--	--	--	--	--	--	-	-
	Ammonia, as nitrogen	mg/L	20	0	-	-	-	0.2	DQR at PQL	30	SS
	Chemical oxygen demand	mg/L	20	3	6.42	13.5	9.9266667	13.5	Max Detected	-	-
	Total dissolved solids (TDS)	mg/L	--	--	--	--	--	--	--	-	-
Metals	Barium, total	mg/L	11	11	0.057	0.104	0.081	0.118	95% UPL (k=8)	2	MCL
	Boron, total	mg/L	--	--	--	--	--	--	--	6	SS
	Calcium, total	mg/L	--	--	--	--	--	--	--	-	-
	Iron, total	mg/L	11	1	0.521	0.521	0.521	0.521	Max Detected	-	-
	Lithium, total	mg/L	--	--	--	--	--	--	--	0.014	SS
	Magnesium, total	mg/L	11	11	39.2	45.4	42.0	47.8	95% UPL (k=8)	-	-
	Molybdenum, total	mg/L	--	--	--	--	--	--	--	0.04	SS
Organics	Phenols	mg/L	20	0	-	-	-	0.02	DQR at max PQL	-	-

Notes:

Prepared by: L. Auner, 1/9/2024

Checked by: M. Holicky 1/11/2024

- = not established or not applicable

* = excluding outlier

UPL = upper prediction limit

LPL = lower prediction limit

KM = Kaplan-Meier

DQR = double quantification rule

PQL = practical quantitation limit

k = number of future comparisons for UPL calculation

GWPS = groundwater protection standard

MCL = EPA maximum contaminant level

SS = statewide standard

-- = parameter added in October 2023, not enough data yet for background evaluation

Footnotes:

1. The data set used for background calculations consisted of the most recent results through October 2022. Background levels will be updated for the 2025 Annual Report, after two years of use.
2. MCLs from https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations
   SSs from https://programs.iowadnr.gov/riskcalc/home/statewidestandards (used most protective standard for groundwater)
   The SS listed for ammonia as nitrogen is the standard established for ammonia.

Table 6: Summary of Detections with No Immediately Preceding SSIs
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Constituent	Units	Most Recent Result (October 2024)	Background Level
MW-2	Chloride	mg/L	7.58	8.05
	Barium, total	mg/L	0.0857	0.118
	Magnesium, total	mg/L	42.1	47.8
	pH	SU	7.1	6.7 - 8.0
	Specific conductance	µmhos	783.4	753.5
	TDS	mg/L	424	-
	Calcium, total	mg/L	101	-
	Sulfate	mg/L	19.9	-
MW-3	Barium, total	mg/L	0.0628	0.118
	pH	SU	7.1	6.7 - 8.0
	TDS	mg/L	810	-
	Boron, total	mg/L	2.35	-
	Calcium, total	mg/L	129	-
	Sulfate	mg/L	119	-

Notes:

Background exceedances from the spring sampling event that weren't confirmed as SSIs are discussed in the report text.

Data is for downgradient wells only.

- = Background level has not yet been established (parameter was added in October 2023)

Prepared by: L. Auner, 12/30/2024

Checked by: M. Holicky 1/9/2025

Table 7: Summary of Ongoing and Newly Identified SSIs
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Constituent	Units	Most Recent Result (October 2024)	Background Level	Lower Confidence Limit	GWPS	Sample Dates	
							Initial Exceedance	Verification Sample
MW-2	Nitrate, as nitrogen	mg/L	1.52	0.5	-	10	10/26/2022	4/24/2023
MW-3	Chloride	mg/l	112	8.05	-	-	4/26/2021	10/7/2021
	Nitrate, as nitrogen	mg/L	0.782	0.5	-	10	4/27/2022	10/26/2022
	Magnesium, total	mg/l	59.2	47.8	-	-	4/26/2021	10/7/2021
	Specific conductance	µmhos	1425.6	753.5	-	-	4/26/2021	10/7/2021

Notes:

Prepared by: 12/30/2024

Checked by: M. Holicky 1/9/2025

- = Not applicable

GWPS = groundwater protection standard

Lower confidence limits were not calculated because GWPS were not exceeded by individual results.

Table 8: Summary of Ongoing and Newly Identified SSLs
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Constituent	Units	Most Recent Result	Upper Confidence Limit	GWPS	Initial Exceedance	Consecutive Compliance Dates		
							1st Occurrence	Most Recent	Duration
NA									

Notes:
NA - Table not applicable; SSLs have not been identified.

Table 9a: MW-1 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 1991	7.1	750	53	0.1	4.5	12	0.10		0.029	0.023	16		< 0.0005					
Jul. 1991	7.2	410	62	< 0.1	2.5	12	< 0.02		0.019	0.004	22		< 0.0005					
Oct. 1991	7.2	430	62	< 0.1	1.5	< 1	< 0.02		0.023	0.060	32		< 0.0005					
Jan. 1992	9.6	550	50	< 0.1	1.0	10	< 0.02		< 0.010	0.005	28		< 0.0005					
Apr. 1992	7.8	460	53	< 0.2	< 5.0	5	< 0.10		< 0.01	< 0.005	29		< 0.001					
Oct. 1992	9.5	440	56	< 0.2	< 5.0	5	0.30		< 0.010	< 0.005	27		< 0.001					
Mar. 1993	9.1	500	56	< 0.2	< 5.0	< 5	< 0.10		< 0.010	< 0.005	29		< 0.001	< 0.005				
Sep. 1993	7.0	1250*	53	< 0.2	1000*	16*	2.7*		1.54*	< 0.005	160*		< 0.002	< 0.005				
Mar. 1994	7.4	600	56	< 0.2	23.0	< 5	0.12		0.024	0.008	41		< 0.001	< 0.005				
Sep. 1994	7.8	550	51	< 0.2	6.0	< 5	< 0.10		0.041	< 0.020								
Mar. 1995	7.9	540	46	< 0.2	< 5.0	< 5	< 0.10		0.018	< 0.020								
Sep. 1995	8.0	460	57	< 0.2	17.0	5	< 0.10		0.170	< 0.020								
Apr. 1996	8.8	570	47	< 0.2	5.4	< 5	< 0.10		0.012	< 0.020								
Oct. 1996	8.4	630	45	< 0.2	5.2	< 5	0.24		0.016	< 0.020								
Apr. 1997	8.5	560	52	< 0.2	< 5.0	< 5	0.15		0.014	< 0.020								
Oct. 1997	8.1	570	55	< 0.2	< 5.0	< 5	0.34		< 0.010	< 0.020								
Apr. 1998	8.0	540	54	< 0.2	8.8	< 5	0.92		< 0.010	< 0.020								
Sep. 1998	8.2	520	57	< 0.2	< 5.0	< 5	0.22		0.068	< 0.020								
Mar. 1999	8.4	590	54	< 0.2	6.2	5	1.70		0.085	< 0.020								
Sep. 1999	7.9	510	54	< 0.2	< 5.0	< 5	0.37		< 0.010	< 0.020								
Mar. 2000	7.9	560	51	< 0.2	< 5.0	< 5	0.24		< 0.010	< 0.020								
Sep. 2000	7.8	510	56	< 0.2	< 5.0	< 5	0.19		0.044	< 0.020								
Mar. 2001	8.1	530	53	< 0.2	5.3	5.5	0.30		0.062	< 0.020								
Sep. 2001	8.1	520	55	< 0.2	5.5	5.1	0.40		< 0.010	< 0.020								
Mar. 2002	8.7	580	52	< 0.2	< 5.0	< 5	0.25		0.011	< 0.020								
Sep. 2002	8.3	580	54	< 0.2	< 5.0	12.0	0.14		0.048	< 0.020								
Mar. 2003	8.5	590	52	< 0.2	< 5.0	7.9	< 0.10		0.056	< 0.020								
Oct. 2003	8.2	570	52	< 0.2	< 5.0	18.0	0.11		0.047	< 0.020								
Mar. 2004	8.7	520	53	< 0.2	< 5.0	7.1	< 0.10		0.037	< 0.020								
Oct. 2004	8.9	600	52	< 0.2	< 5.0	< 5.0	< 0.10		0.044	< 0.020								
Mar. 2005	8.4	740	50	< 0.2	< 5.0	5.6	0.14		0.043	< 0.020								
Oct. 2005	7.8	600	53	< 0.2	< 5.0	5.0	< 0.10		0.051	< 0.020								
Mar. 2006	7.9	660	52	< 0.2	< 5.0	5.4	< 0.10		0.023	< 0.020								
Oct. 2006	7.6	670	54	< 0.2	< 5.0	< 5.0	< 0.10		0.044	< 0.020								
Mar. 2007	7.9	650	51	0.2	< 5.0	5.7	< 0.10		0.055	< 0.020								
Oct. 2007	7.4	690	54	< 0.2	< 5.0	< 5.0	< 0.10		0.041	< 0.020								
Mar. 2008	7.6	660	53	< 0.2	< 5.0	7.3	< 0.10		0.040	< 0.020								
Sep. 2008	7.3	610	52	< 0.2	< 5.0	< 5.0	< 0.10		0.042	< 0.020								
Mar. 2009	7.6	650	51	< 0.2	< 5.0	< 5.0	< 0.10		0.036	< 0.020								
Oct. 2009	7.5	610	52	< 0.2	< 5.0	< 5.0	< 0.10		0.029	< 0.018								
Apr. 2010	7.3	600	53	< 0.2	< 5.0	< 5.0	< 0.10		0.034	< 0.018	41				0.10	0.0734		< 0.100
Oct. 2010	7.3	620	51	< 0.2	< 5.0	9.8	< 0.10		0.032	< 0.018	39				0.11	0.0760		< 0.100
Apr. 2011	7.4	600	53	< 0.2	< 5.0	< 5.0	< 0.10		0.036	< 0.020	39				0.12	0.0757		< 0.100
Oct. 2011	7.4	620	52	< 0.2	< 5.0	< 5.0	< 0.10		0.025	< 0.018	42				0.13	0.0724		< 0.100
Apr. 2012	7.3	630	53	< 0.2	< 5.0	6.4	< 0.10		0.032	< 0.020	44				< 0.50	0.0706		< 0.100
Oct. 2012	7.3	610	52	< 0.2	< 5.0	< 5.0	< 0.10		0.028	< 0.020	38				< 0.20	0.0718		< 0.100
Apr. 2013	7.4	630	52	< 0.2	< 5.0	< 5.0	< 0.10		< 0.030	< 0.020	42				< 0.50	0.0853		< 0.100
Oct. 2013	7.7	620	52	< 0.2	< 5.0	< 5.0	< 0.10		0.203*	< 0.019	41				< 0.10	0.0709		< 0.100
Jan. 2014									0.0317									
Feb. 2014									0.0318									
Apr. 2014	7.6	610	51	< 0.200	< 5.00	< 5.00	< 0.100		< 0.0300	< 0.0196	41.5				< 0.100	0.0708		< 0.100
May. 2014									< 0.0300									
Oct. 2014	7.6	610	52	< 0.200	< 5.00	< 5.00	< 0.100		0.0482	< 0.0196	42.2				< 0.100	0.0698		< 0.100
Apr. 2015	6.1*	636	51	< 0.200	2.66	< 5.00	< 0.100				42.9			< 0.150	< 0.100	0.0770		< 0.100

Table 9a: MW-1 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Oct. 2015	7.0	560	54	< 0.200	2.93	< 5.00	< 0.100		0.0447	< 0.0204	40.7				< 0.100	0.0809		< 0.100
Apr. 2016	7.3	304	52	< 0.200	2.48	< 5.00	< 0.100		< 0.0620		38.7				0.101	0.0773		< 0.100
Oct. 2016	7.1	562	55	< 0.200	6.69	13.50	< 0.100		0.0470	< 0.0184	40.6				< 0.100	0.0615		< 0.100
Apr. 2017	7.2	472	55	< 0.200	2.50	< 5.00	< 0.500				40.3				< 0.100	0.0703		< 0.100
Oct. 2017	7.3	564	58	< 0.200	< 5.00	< 5.00	< 0.500	< 0.500	0.054	< 0.0188	43.1	43.9			< 0.500	0.0566	0.0569	3.76*
Apr. 2018	7.6	730	42	< 0.200	4.61	< 5.00	< 0.500	0.521			42.8	42.8			0.164	0.0693	0.0747	< 0.100
Oct. 2018	7.8	580	68	< 0.200	5.43	< 10.00	< 0.500	< 0.500		< 0.0196	44.0	40.9			0.117	0.0753	0.0747	< 0.100
Apr. 2019	7.2	665	51	< 0.200	5.35	< 5.00	< 0.500	< 0.500			40.6	40.6			< 0.100	0.0620	0.0814	< 0.100
Oct. 2019	7.1	625	42	< 0.200	5.38	< 5.00	< 0.500	< 0.500		< 0.0200	36.6	39.2			0.251	0.0687	0.0741	< 0.100
Apr. 2020	7.4	609	48	< 0.200	5.04	< 5.00		< 0.500				41.4			< 0.100		0.0831	< 0.500
Oct. 2020	7.2	614	57	< 0.200	5.31	< 5.00		< 0.500		< 0.0184		41.1			< 0.100		0.0874	< 0.100
Apr. 2021	7.4	604	56	< 0.200	4.77	9.86		< 0.500		< 0.0188		43.0			0.113		0.0890	
Oct. 2021	7.4	639	60	< 0.200	5.60	6.42		< 0.500		< 0.0200		40.2			< 0.100		0.0853	< 0.100
Apr. 2022	7.4	631	53	< 0.200	5.36	< 5.00		< 0.500				45.4			< 0.100		0.1040	< 0.100
Oct. 2022	7.0	646	55	< 0.200	5.16	< 5.00		< 0.500		< 0.0200		43.1			< 0.100		0.0796	< 0.100
Apr. 2023	7.5	412	54	< 0.200	5.45	6.37		< 0.500				48.5			< 0.100		0.1010	< 0.200
Oct. 2023	7.6	601	62	< 0.200	4.78	< 5.00		< 0.500		< 0.0200		42.3			< 0.200		0.0894	< 0.200
Apr. 2024	7.4	571	55	< 0.200	5.68	< 5.00		< 0.500				38.5			< 0.200		0.0770	< 0.200
Oct. 2024	7.4	630	54	< 0.200	4.82	12.3		< 0.500		< 0.0200		37.9			< 0.200		0.0853	< 0.200

Notes:
* Outlier or erroneous measurement, excluded from use in background level calculations.
Qualifiers not included in table.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky 1/10/2025

Table 9b: MW-2 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample	Parameters																	
	pH (field) Standard Units	Specific Cond. (field) µmhos	Temp. (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
Date	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 1991	7.0	1,150	53	< 0.100	110.0	8.00	< 0.020		< 0.0100	0.0020	51.0		0.0017					
Jul. 1991	7.1	1,180	58	< 0.100	140.0	22.00	< 0.020		< 0.0100	< 0.0020	49.0		0.0015					
Oct. 1991	7.2	1,120	54	< 0.100	130.0	36.00	< 0.020		0.0230	< 0.0020	56.0		0.0012					
Jan. 1992	7.8	1,210	53	< 0.100	130.0	25.00	< 0.020		0.0190	< 0.0020	50.0		0.0014					
Apr. 1992	7.8	1,280	55	< 0.200	140.0	8.00	< 0.100		0.0200	< 0.0050	51.0		< 0.025					
Oct. 1992	7.8	1,280	55	< 0.200	34.0	8.00	< 0.100		< 0.0100	< 0.0050	55.0		< 0.001					
Mar. 1993	7.1	1,270	54	< 0.200	150.0	< 5.00	< 0.100		0.0110	< 0.0050	60.0		< 0.001	< 0.005				
Sep. 1993	7.8	830	54	< 0.200	170.0	< 5.00	< 0.100		< 0.0100	0.0220	65.0		< 0.001	< 0.005				
Mar. 1994	7.2	1,200	56	< 0.200	150.0	< 5.00	< 0.100		< 0.0100	< 0.0050	59.0		0.001	< 0.005				
Sep. 1994	7.5	1,180	53	< 0.200	140.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 1995	7.8	1,100	45	< 0.200	110.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 1995	7.8	950	56	< 0.200	100.0	< 5.00	< 0.100		0.0220	< 0.0200								
Apr. 1996	8.2	1,090	48	0.310	99.0	< 5.00	< 0.100		0.0400	< 0.0200								
Oct. 1996	7.6	1,030	47	< 0.200	81.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Apr. 1997	8.5	1,080	52	< 0.200	71.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 1997	8.0	920	53	< 0.200	52.0	< 5.00	< 0.100		< 0.0100	0.0220								
Apr. 1998	8.5	750	58	< 0.200	51.0	< 5.00	< 0.100		< 0.0100	0.0295								
Sep. 1998	8.1	750	56	< 0.200	52.0	< 5.00	< 0.100		< 0.0200	< 0.0200								
Mar. 1999	7.8	950	53	< 0.200	48.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 1999	7.5	830	56	< 0.200	46.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2000	8.2	860	53	< 0.200	49.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 2000	7.5	830	54	< 0.200	47.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2001	8.1	850	52	< 0.200	33.1	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 2001	8.0	900	50	< 0.200	26.1	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2002	8.7	940	53	< 0.200	28.8	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 2002	8.3	890	54	< 0.200	37.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2003	9.2	880	50	< 0.200	25.8	5.20	< 0.100		< 0.0100	< 0.0200								
Oct. 2003	7.8	900	52	< 0.200	21.5	< 5.00	< 0.100		< 0.0100	0.0210								
Mar. 2004	7.6	760	54	< 0.200	23.1	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 2004	8.9	930	52	< 0.200	19.7	< 5.00	< 0.100		< 0.0100	0.0210								
Mar. 2005	7.4	1,090	50	< 0.200	19.2	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 2005	7.4	860	54	< 0.200	24.3	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2006	7.2	990	51	< 0.200	25.2	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 2006	7.3	910	52	< 0.200	27.8	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2007	7.2	930	50	< 0.200	27.2	7.50	< 0.100		< 0.0100	< 0.0200								
Oct. 2007	7.1	990	54	< 0.200	28.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2008	7.2	900	50	< 0.200	27.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 2008	7.0	890	52	< 0.200	30.6	< 5.00	< 0.100		0.0410	< 0.0180								
Mar. 2009	7.1	870	53	< 0.200	26.4	5.70	< 0.100		< 0.0100	< 0.0200								
Oct. 2009	7.2	870	51	< 0.200	25.6	< 5.00	< 0.100		0.0131	< 0.0180								
Apr. 2010	7.1	830	53	< 0.200	24.8	< 5.00	< 0.100		< 0.0100	< 0.0180	49.2				0.139	0.0946		0.730
Oct. 2010	7.1	860	52	< 0.200	24.9	< 5.00	< 0.100		< 0.0100	< 0.0180	32.9				0.169	0.0644		0.930
Apr. 2011	7.1	840	52	< 0.200	24.7	6.10	< 0.100		< 0.0100	< 0.0180	43.8				0.156	0.0877		0.700
Oct. 2011	7.1	820	52	< 0.200	22.3	< 5.00	< 0.100		< 0.0100	< 0.0200	46.5				0.217	0.0873		0.590
Apr. 2012	7.1	820	52	< 0.200	23.6	< 5.00	< 0.100		0.0105	< 0.0200	48.5				< 0.500	0.0873		0.590
Oct. 2012	7.0	820	53	< 0.200	24.7	< 5.00	< 0.100		0.0114	< 0.0200	45.5				< 0.200	0.0931		0.582
Apr. 2013	7.0	830	51	< 0.200	20.8	5.10	< 0.100		< 0.0300	< 0.0200	44.2				< 0.500	0.1040		0.631
Oct. 2013	7.4	820	52	< 0.200	20.7	6.70	< 0.100		0.233	< 0.0204	43.2				0.166	0.0878		0.317
Jan. 2014									< 0.0300									
Feb. 2014									< 0.0300									
Apr. 2014	7.4	800	51	< 0.200	17.3	< 5.00	< 0.100		< 0.0300	< 0.0200	45.3				0.146	0.0942		0.607
May. 2014									< 0.0300									
Oct. 2014	7.6	760	53	< 0.200	13.4	< 5.00	< 0.100		< 0.0300	< 0.0208	43.4				0.173	0.0876		0.728

Table 9b: MW-2 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

	Parameters																	
Sample Date	pH (field) Standard Units	Specific Cond. (field) µmhos	Temp. (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 2015	6.49*	711	51	< 0.200	16.6	< 5.00	< 0.100				42.2			< 0.150	0.156	0.0849		0.440
Oct. 2015	7.0	687	53	< 0.200	15.7	< 5.00	< 0.100		0.0261	< 0.0180	47.2				0.142	0.0883		0.439
Apr. 2016	7.1	694	51	< 0.200	16.2	< 5.00	< 0.100		0.0350		40.6				0.177	0.0822		0.413
Oct. 2016	7.0	766	55	< 0.200	15.6	6.69	< 0.100		< 0.0250	< 0.0188	42.5				0.109	0.0864		0.577
Apr. 2017	7.0	681	53	< 0.200	15.0	< 5.00	< 0.500				43.2				0.155	0.0801		0.599
Oct. 2017	7.0	629	59	< 0.200	11.6	< 5.00	< 0.500	< 0.500	0.122	< 0.0196	43.3	44.4			0.222	0.0814	0.0805	0.845
Apr. 2018	7.3	801	44	< 0.200	10.2	< 5.00	< 0.500	< 0.500			45.3	44.0			0.192	0.0804	0.0841	0.823
Oct. 2018	7.4	695	75	< 0.200	12.1	< 5.00	< 0.500	< 0.500		< 0.0192	45.5	44.6			0.292	0.0791	0.0788	0.780
Apr. 2019	7.1	760	51	< 0.200	10.1	< 5.00	< 0.500	< 0.500			41.3	43.6			0.108	0.0692	0.0881	0.802
Oct. 2019	7.1	736	43	< 0.200	9.6	< 5.00	< 0.500	< 0.500		< 0.0180	42.0	36.5			0.190	0.0832	0.0734	0.950
Apr. 2020	7.2	749	47	< 0.200	9.4	< 5.00		< 0.500				46.1			< 0.100		0.0900	0.909
Oct. 2020	7.0	736	56	< 0.200	10.6	< 5.00		< 0.500		< 0.0188		44.3			0.165		0.0890	0.316
Apr. 2021	7.2	710	56	< 0.200	8.1	6.44		< 0.500		< 0.0184		45.1			< 0.100		0.0896	
Oct. 2021	7.2	780	61	< 0.200	9.4	5.36		< 0.500		< 0.0192		44.3			< 0.100		0.0886	0.250
Apr. 2022	7.2	774	53	< 0.200	9.3	14.60		< 0.500				46.3			< 0.100		0.1040	0.488
Oct. 2022	6.9	802	54	< 0.200	8.7	< 5.00		< 0.500		< 0.0200		45.7			0.208		0.0818	1.06
Apr. 2023	7.8	627	53	< 0.200	7.8	< 5.00		< 5.000				51.3			< 0.200		0.107	1.23
Oct. 2023	7.3	737	65	< 0.200	7.9	7.07		< 5.000		< 0.0204		44.2			< 0.200		0.0915	2.88
Apr. 2024	7.2	694	59	< 0.200	8.3	< 5.00		< 5.000				41.6			< 0.200		0.0825	1.39
Oct. 2024	7.1	783	55	< 0.200	7.58	< 5.00		< 5.000		< 0.0216		42.1			< 0.200		0.0857	1.52

Notes:
* Erroneous measurement
Qualifiers not included in table.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky 1/10/2025

Table 9c: MW-3 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample	Parameters																	
	pH (field) Standard Units	Specific Cond. (field) µmhos	Temp. (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
Date	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 1991	7.7	500	53	< 0.100	28.0	< 1.00	0.020		0.0150	0.0040	36.0		< 0.0005					
Jul. 1991	7.3	730	66	< 0.100	28.0	14.00	< 0.020		0.0110	< 0.0020	39.0		< 0.0005					
Oct. 1991	7.6	510	53	< 0.100	26.0	< 1.00	< 0.020		0.0330	< 0.0020	44.0		< 0.0005					
Jan. 1992	8.1	820	54	< 0.100	28.0	10.00	< 0.020		< 0.0100	< 0.0020	42.0		< 0.0005					
Apr. 1992	7.6	700	55	< 0.200	24.0	< 5.00	< 0.100		< 0.0100	< 0.0050	38.0		< 0.005					
Oct. 1992	7.7	680	55	< 0.200	26.0	< 5.00	< 0.100		< 0.0100	< 0.0050	33.0		< 0.001					
Mar. 1993	7.3	790	55	< 0.200	36.0	< 5.00	0.170		< 0.0100	< 0.0050	43.0		< 0.001	< 0.005				
Sep. 1993	6.8	790	53	< 0.200	37.0	< 5.00	0.120		< 0.0100	< 0.0050	48.0		< 0.001	< 0.005				
Mar. 1994	7.7	810	55	< 0.200	61.0	< 5.00	0.120		< 0.0100	< 0.0050	48.0		< 0.001	< 0.005				
Sep. 1994	7.6	780	51	< 0.200	37.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 1995	8.1	580	47	< 0.200	43.0	< 5.00	0.180		< 0.0100	< 0.0200								
Sep. 1995	8.4	780	54	< 0.200	56.0	< 5.00	0.160		< 0.0100	< 0.0200								
Apr. 1996	8.7	880	49	0.270	57.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 1996	7.8	910	43	< 0.200	56.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Apr. 1997	8.5	1,030	50	< 0.200	53.0	5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 1997	8.2	840	53	< 0.200	49.0	< 5.00	0.110		< 0.0100	< 0.0200								
Apr. 1998	8.1	700	55	< 0.200	53.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 1998	8.1	750	56	< 0.200	49.0	< 5.00	< 0.100		< 0.0200	< 0.0200								
Mar. 1999	8.4	840	52	< 0.200	55.0	< 5.00	0.180		0.0120	< 0.0200								
Sep. 1999	7.7	810	57	< 0.200	57.0	< 5.00	0.330		< 0.0100	< 0.0200								
Mar. 2000	7.9	860	52	< 0.200	58.0	< 5.00	0.400		< 0.0100	< 0.0200								
Sep. 2000	7.6	840	54	< 0.200	72.0	< 5.00	0.240		< 0.0100	< 0.0200								
Mar. 2001	8.6	810	51	< 0.200	69.4	< 5.00	0.200		< 0.0100	< 0.0200								
Sep. 2001	8.3	800	54	4.620	77.7	< 5.00	0.180		< 0.0100	< 0.0200								
Mar. 2002	8.8	900	49	< 0.200	79.9	6.50	0.180		< 0.0100	< 0.0200								
Sep. 2002	7.8	890	53	< 0.200	75.9	8.30	0.170		< 0.0100	< 0.0200								
Mar. 2003	8.9	990	51	< 0.200	84.9	7.00	< 0.100		< 0.0100	< 0.0200								
Oct. 2003	7.8	970	52	< 0.200	87.5	< 5.00	0.160		< 0.0100	< 0.0200								
Mar. 2004	12.3	1,030	54	< 0.200	116	6.30	< 0.100		< 0.0100	< 0.0200								
Oct. 2004	9.0	1,120	52	< 0.200	105	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2005	7.7	1,210	50	< 0.200	80.6	6.10	< 0.100		< 0.0100	< 0.0200								
Oct. 2005	7.5	1,100	53	< 0.200	97.0	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2006	7.4	1,360	52	< 0.200	107	6.10	< 0.100		< 0.0100	< 0.0200								
Oct. 2006	7.5	1,150	52	< 0.200	97.5	< 5.00	0.168		< 0.0100	< 0.0200								
Mar. 2007	7.3	1,260	50	< 0.200	107	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 2007	7.1	1,319	54	< 0.200	111	9.20	< 0.100		< 0.0100	< 0.0200								
Mar. 2008	7.2	1,280	50	< 0.200	116	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 2008	7.1	5,400	51	< 0.200	114	< 5.00	< 0.100		0.0450	< 0.0200								
Mar. 2009	7.2	1,140	50	< 0.200	91.7	7.80	< 0.100		< 0.0100	< 0.0200								
Oct. 2009	7.2	1,100	51	< 0.200	90.3	< 5.00	< 0.100		0.0119	< 0.0200								
Apr. 2010	7.0	1,100	52	< 0.200	102	< 5.00	< 0.100		< 0.0100	< 0.0200	52.7				0.119	0.0690		0.140
Oct. 2010	7.0	1,140	51	< 0.200	107	< 5.00	< 0.100		< 0.0123	< 0.0180	50.5				0.134	0.0672		0.130
Apr. 2011	7.1	1,070	52	< 0.200	99.7	< 5.00	< 0.100		< 0.0120	< 0.0200	44.5				0.152	0.0657		< 0.100
Oct. 2011	7.1	1,140	52	< 0.200	112	6.40	< 0.100		< 0.0123	< 0.0180	55.6				0.189	0.7930		0.130
Apr. 2012	7.1	1,150	52	< 0.200	115	5.40	< 0.100		< 0.0100	< 0.0200	54.8				< 0.500	0.0729		< 0.100
Oct. 2012	7.1	1,100	52	< 0.200	105	< 5.00	0.114		0.0128	< 0.0200	49.4				< 0.200	0.0718		< 0.100
Apr. 2013	7.2	1,150	52	< 0.200	103	< 5.00	< 0.100		< 0.0300	< 0.0192	52.6				< 0.500	0.0841		0.101
Oct. 2013	7.4	1,270	52	< 0.200	128	11.90	< 0.100		8.0100	< 0.0192	55.0				0.123	0.708		< 0.100
Jan. 2014									0.0570									
Feb. 2014									< 0.0300									
Apr. 2014	7.5	1,220	52	< 0.200	114	< 5.00	< 0.100		< 0.0300	< 0.0196	52.5				0.120	0.0646		< 0.100
May. 2014									< 0.0300									
Oct. 2014	7.4	1,320	52	< 0.200	137	< 5.00	< 0.100		< 0.0300	< 0.0208	59.4				0.132	0.0653		0.162
Apr. 2015	6.11*	1,081	51	< 0.200	111	< 5.00	< 0.100				56.2			< 0.150	0.119	0.0822		< 0.100

Table 9c: MW-3 Groundwater Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample	Parameters																	
	pH (field) Standard Units	Specific Cond. (field) µmhos	Temp. (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	TCE mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
Date	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Oct. 2015	7.1	1,219	53	< 0.200	122	< 5.00	< 0.100		0.1100	< 0.0180	55.3				< 0.500	0.0652		0.275
Apr. 2016	7.0	1,229	51	< 0.200	126	< 5.00	< 0.100		0.0540		55.6				0.122	0.0691		< 0.100
Oct. 2016	7.6	1,442	54	< 0.200	138.0	13.50	< 0.100		0.0320	< 0.0188	60.6				< 0.100	0.0583		0.342
Apr. 2017	7.4	1,374	52	< 0.200	121	6.65	< 0.500				59.9				< 0.100	0.0644		0.142
Oct. 2017	6.9	1,370	54	< 0.200	139	34.6	< 0.500	< 0.500	< 0.010	< 0.0196	65.4	62.2			< 0.100	0.0479	0.0490	1.17
Apr. 2018	7.2	1,530	48	< 0.200	115	< 5.00	< 0.500	< 0.500			65.2	63.4			< 0.100	0.0470	0.0524	1.18
Oct. 2018	7.2	1,420	61	< 0.200	115	< 5.00	< 0.500	< 0.500		< 0.0196	65.3	59.9			< 0.100	0.0478	0.0475	1.17
Apr. 2019	7.0	1,463	50	< 0.200	114	< 5.00	< 0.500	< 0.500			59.1	58.6			< 0.100	0.0397	0.0527	1.27
Oct. 2019	7.0	1,375	51	< 0.200	111	7.72	< 0.500	< 0.500		< 0.0184	56.0	56.8			< 0.100	0.0477	0.0493	1.30
Apr. 2020	6.4	1,190	50	< 0.200	95	< 5.00		< 0.500				55.7			0.102		0.0635	0.46
Oct. 2020	7.0	1,121	56	< 0.200	107	< 5.00		< 0.500		< 0.0188		54.0			< 0.140		0.0687	0.20
Apr. 2021	7.1	1,198	56	< 0.200	94	9.86		< 0.500		< 0.0192		58.2			0.358		0.0595	
Oct. 2021	7.0	1,363	59	< 0.200	102	5.36		< 0.500		< 0.0208		60.0			< 0.100		0.0516	0.21
Apr. 2022	7.0	1,384	52	< 0.200	102	< 5.00		< 0.500				68.0			< 0.100		0.0634	0.57
Oct. 2022	6.8	1,374	53	< 0.200	92	5.20		< 0.500		< 0.0200		62.4			< 0.100		0.0472	0.96
Apr. 2023	7.3	1,286	52	< 0.200	100	9.74		< 0.500				67.4			< 0.200		0.0858	0.63
Oct. 2023	7.3	1,244	59	< 0.200	76	5.70		< 0.500		< 0.0200		58.6			< 0.200		0.0534	0.94
Apr. 2024	7.2	1,192	53	< 0.200	81	5.56		< 0.500				55.6			< 0.200		0.0455	0.64
Oct. 2024	7.1	1,426	52	< 0.200	112	< 10.00		< 0.500		< 0.0200		59.2			< 0.200		0.0628	0.782

Notes:

* Erroneous measurement
Qualifiers not included in table.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky 1/10/2025

Table 9d: Stage 1 Underliner Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	Trichloroethylene mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 1991	7.0	1,150	53	< 0.100	110.00	8.00	< 0.020		< 0.0100	0.0020	16.0		< 0.0005					
Jul. 1991	7.1	1,180	58	< 0.100	140.00	22.00	< 0.020		< 0.0100	< 0.0020	22.0		< 0.0005					
Oct. 1991	7.2	1,120	54	< 0.100	130.00	36.00	< 0.020		0.0230	< 0.0020	32.0		< 0.0005					
Jan. 1992	7.8	1,210	53	< 0.100	130.00	25.00	< 0.020		0.0190	< 0.0020	28.0		< 0.0005					
Apr. 1992	7.8	1,280	55	< 0.200	140.00	8.00	< 0.100		0.0200	< 0.0050	29.0		< 0.0010					
Oct. 1992	7.8	1,280	55	< 0.200	34.00	8.00	< 0.100		< 0.0100	< 0.0050	27.0		< 0.0010					
Mar. 1993	7.1	1,270	54	< 0.200	150.00	< 5.00	< 0.100		0.0110	< 0.0050	29.0		< 0.0010	< 0.0050				
Sep. 1993	7.8	830	54	< 0.200	170.00	< 5.00	< 0.100		< 0.0100	0.0220	160.0		< 0.0020	< 0.0050				
Mar. 1994	7.2	1,200	56	< 0.200	150.00	< 5.00	< 0.100		< 0.0100	< 0.0050	41.0		< 0.0010	< 0.0050				
Sep. 1994	7.5	1,180	53	< 0.200	140.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 1995	7.8	1,100	45	< 0.200	110.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 1995	7.8	950	56	< 0.200	100.00	< 5.00	< 0.100		0.0220	< 0.0200								
Apr. 1996	8.2	1,090	48	0.310	99.00	< 5.00	< 0.100		0.0400	< 0.0200								
Oct. 1996	7.6	1,030	47	< 0.200	81.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Apr. 1997	8.5	1,080	52	< 0.200	71.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 1997	8.0	920	53	< 0.200	52.00	< 5.00	< 0.100		< 0.0100	0.0220								
Apr. 1998	7.3	>1000	61	4.300	420.00	44.00	0.120		0.1880	<0.020								
Sep. 1998	8.0	>999	64	< 0.200	360.00	54.00	13.000		0.1270	< 0.0200								
Mar. 1999	7.7	>999	58	4.700	390.00	44.00	0.300		0.0670	< 0.0200								
Sep. 1999	8.1	>1000	63	0.440	390.00	30.00	< 0.100		< 0.0100	< 0.0200								
Mar. 2000	6.7	>1000	58	0.940	560.00	50.00	< 0.100		0.0700	< 0.0200								
Sep. 2000	7.4	>1000	64	< 0.200	630.00	< 5.00	< 0.100		0.0730	< 0.0200								
Mar. 2001	8.3	>1000	54	< 0.200	567.00	39.00	< 0.100		0.0650	< 0.0200								
Sep. 2001	7.9	950	62	4.510	454.00	62.00	5.300		0.0660	< 0.0200								
Mar. 2002	8.5	>1000	57	4.800	514.00	60.00	5.300		0.0670	< 0.0200								
Sep. 2002	7.5	>1000	62	5.810	406.00	72.00	9.500		0.0910	0.0460								
Mar. 2003	7.7	>1000	57	5.600	415.00	63.00	0.310		0.0840	< 0.0200								
Oct. 2003	7.6	>1000	60	5.040	500.00	66.00	1.060		0.0900	< 0.0200								
Mar. 2004	7.9	>1000	62	1.170	405.00	52.00	< 0.100		0.0680	< 0.0200								
Oct. 2004	9.1	>1000	64	5.270	452.00	63.00	2.500		0.0830	0.0250								
Mar. 2005	7.7	1,210	50	< 0.200	414.00	86.00	15.000		0.0960	0.0290								
Oct. 2005	8.2	>1000	63	8.230	508.00	83.00	16.000		0.1050	0.0200								
Mar. 2006	7.3	>1000	56	8.370	488.00	91.70	13.600		0.0821	< 0.0200								
Oct. 2006	7.1	>1000	59	7.320	372.00	57.30	11.600		0.0579	< 0.0200								
Mar. 2007	7.1	3,400	55	6.520	385.00	60.60	8.460		0.0575	0.0200								
Oct. 2007	7.0	3,760	62	6.820	374.00	68.40	14.500		0.0640	< 0.0180								
Mar. 2008	6.9	2,800	59	5.480	262.00	55.70	8.980		0.0545	< 0.0200								
Sep. 2008	7.0	3,500	60	6.560	392.00	75.50	1.510		0.2400	< 0.0180								
Mar. 2009	7.8	3,000	57	6.700	321.00	54.70	8.980		0.0847	< 0.0200								
Oct. 2009	7.3	3,400	58	2.210	380.00	41.20	< 0.100		0.0530	< 0.0180								
Apr. 2010	7.8	2,600	59	3.770	202.00	35.10	< 0.100		0.0524	< 0.0180	49.9				0.746	0.337		< 0.100
Oct. 2010	7.0	3,000	59	6.920	294.00	75.80	0.874		< 0.5000	< 0.0180	44.9				1.01	0.376		< 0.100
Apr. 2011	7.3	2,700	58	6.830	294.00	47.40	< 0.100		0.1360	< 0.0180	32.2				1.14	0.273		0.720
Oct. 2011	7.1	2,700	59	7.050	250.00	57.00	13.500		0.0943	< 0.0180	46.5				1.05	0.273		< 0.100
Apr. 2012	7.1	2,700	57	9.610	252.00	66.00	11.100		0.0644	< 0.0200	43.9				1.06	0.788		< 0.100
Oct. 2012	7.1	2,500	57	7.070	248.00	31.80	0.175		0.0647	< 0.0200	43.9				0.834	0.513		0.394
Apr. 2013	7.3	2,500	57	5.810	248.00	44.60	< 0.100		0.0995	< 0.0200	45.7				0.577	0.717		0.371
Oct. 2013	7.5	2,300	58	6.480	206.00	44.60	13.900		20.0000	< 0.0184	38.2				0.890	0.708		0.175
Jan. 2014									0.147									
Feb. 2014									0.0770									
Apr. 2014	8.2	2,400	52	< 0.200	244	32.4	< 0.100		0.152	0.0216	39.5				0.760	0.337		2.92
May. 2014									0.0840									
Oct. 2014	7.3	1,860	57	5.28	160	37.1	4.90		0.0786	< 0.0216	37.5				0.791	0.475		< 0.100
Apr. 2015	6.4	2,331	52	< 0.200	193	28.6	< 0.100				40.6			< 0.150	0.689	0.263		4.33

Table 9d: Stage 1 Underliner Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	Trichloroethylene mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Oct. 2015	8.0	2,468	66	< 0.200	158	24.6	< 0.100		0.1220	< 0.0200	41.2				< 0.500	0.505		3.67
Apr. 2016	8.3	2,391	66	0.499	133	31.8	< 0.100		0.0900		39.9				0.516	0.627		2.18
Oct. 2016	8.1	1,871	62	1.48	127	40.3	< 0.100		0.0890	< 0.0196	46.2				0.649	0.706		2.04
Apr. 2017	8.2	2,391	62	0.802	123	16.5	< 0.500				35.8				< 0.500	0.490		2.35
Oct. 2017	7.0	1,200	61	8.12	188	56.2	< 0.500	1.34	0.063	0.0215	72.4	70.2			1.02	0.200	0.203	< 0.100
Apr. 2018	8.6	1,690	51	< 0.200	153	23.9	< 0.500	< 0.500			41.1	40.7			0.595	0.375	0.389	2.930
Oct. 2018	7.2	1,590	66	2.14	141	21.7	< 0.500	3.66		< 0.0192	46.6	42.8			0.631	0.750	0.800	1.13
Apr. 2019	7.9	1,951	55	4.15	189	42.1	< 0.500	3.24			45.0	46.1			0.423	0.631	0.880	0.23
Oct. 2019	7.2	1,865	52	4.24	117	36.4	1.520	1.97		< 0.0192	38.3	40.7			0.547	0.790	0.863	< 0.100
Apr. 2020	6.8	1,782	56	4.97	124	40.4		20.90				41.4			0.614		0.916	< 0.100
Oct. 2020	6.9	1,829	69	4.74	118	35.5		15.30		< 0.0184		43.9			< 0.100		1.180	< 0.100
Apr. 2021	7.3	1,785	61	5.18	99.6	41.7		2.02		< 0.0184		42.5			1.05		0.675	
Oct. 2021	7.2	1,831	64	4.23	103	31.2		0.75		< 0.0184		38.6			0.274		0.829	< 0.100
Apr. 2022	7.1	1,535	63	0.85	99	21.1		< 0.50				44.4			0.283		1.080	2.400
Oct. 2022	6.6	1,627	63	4.14	91	19.1		11.10		< 0.0200		42.4			< 0.100		0.932	< 0.100
Apr. 2023				3.69	85.1	32.2		3.59				47.8			0.305		0.872	< 0.200
Oct. 2023	8.2	1,135.3	61	< 0.500	76.3	22.1		2.96		< 0.0200		39.6			0.472		0.662	3.80
Apr. 2024	7.6	1,154.7	56	< 0.500	80.9	17.7		< 0.500				42.6			0.311		0.696	2.97
Oct. 2024	7.3	1,211.7	59	< 0.500	60.2	18.8		< 0.500		< 0.0212		38.0			0.456		0.642	2.54

Notes:
Qualifiers not included in table.
Stage 1 underliner samples displayed in this table were collected while the leachate collection system wet valves were open.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky 1/10/2025

Table 9e: Combined Leachate Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	Trichloroethylene mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Apr. 1991	7.0	1,150	53	< 0.100	110.00	8.00	< 0.020		< 0.0100	0.0020	16.0		< 0.0005					
Jul. 1991	7.1	1,180	58	< 0.100	140.00	22.00	< 0.020		< 0.0100	< 0.0020	22.0		< 0.0005					
Oct. 1991	7.2	1,120	54	< 0.100	130.00	36.00	< 0.020		0.0230	< 0.0020	32.0		< 0.0005					
Jan. 1992	7.8	1,210	53	< 0.100	130.00	25.00	< 0.020		0.0190	< 0.0020	28.0		< 0.0005					
Apr. 1992	7.8	1,280	55	< 0.200	140.00	8.00	< 0.100		0.0200	< 0.0050	29.0		< 0.0010					
Oct. 1992	7.8	1,280	55	< 0.200	34.00	8.00	< 0.100		< 0.0100	< 0.0050	27.0		< 0.0010					
Mar. 1993	7.1	1,270	54	< 0.200	150.00	< 5.00	< 0.100		0.0110	< 0.0050	29.0		< 0.0010	< 0.0050				
Sep. 1993	7.8	830	54	< 0.200	170.00	< 5.00	< 0.100		< 0.0100	0.0220	160.0		< 0.0020	< 0.0050				
Mar. 1994	7.2	1,200	56	< 0.200	150.00	< 5.00	< 0.100		< 0.0100	< 0.0050	41.0		< 0.0010	< 0.0050				
Sep. 1994	7.5	1,180	53	< 0.200	140.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Mar. 1995	7.8	1,100	45	< 0.200	110.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Sep. 1995	7.8	950	56	< 0.200	100.00	< 5.00	< 0.100		0.0220	< 0.0200								
Apr. 1996	8.2	1,090	48	0.310	99.00	< 5.00	< 0.100		0.0400	< 0.0200								
Oct. 1996	7.6	1,030	47	< 0.200	81.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Apr. 1997	8.5	1,080	52	< 0.200	71.00	< 5.00	< 0.100		< 0.0100	< 0.0200								
Oct. 1997	8.0	920	53	< 0.200	52.00	< 5.00	< 0.100		< 0.0100	0.0220								
Apr. 1998	8.5	750	58	< 0.200	51.00	< 5.00	< 0.100		< 0.0100	0.0295								
Sep. 1998	8.1	750	56	< 0.200	52.00	< 5.00	< 0.100		< 0.0200	< 0.0200								
Mar. 1999	7.9	1,000	62	8.400	280.00	52.00	< 0.100		0.0470	< 0.0200								
Sep. 1999	8.1	999	68	8.300	280.00	76.00	< 0.100		0.0570	< 0.0200								
Mar. 2000	8.2	1,000	61	9.600	380.00	58.00	< 0.100		0.0330	< 0.0200								
Sep. 2000	7.7	1,000	68	9.250	320.00	< 5.00	< 0.100		0.0700	< 0.0200								
Mar. 2001	8.2	1,000	62	< 0.200	567.00	39.00	< 0.100		0.0650	< 0.0200								
Sep. 2001	8.5	1,000	66	10.800	278.00	84.00	0.500		0.0300	< 0.0200								
Mar. 2002	8.6	1,000	59	10.600	263.00	63.00	< 0.100		0.0420	< 0.0200								
Sep. 2002	8.2	1,000	63	9.770	270.00	68.00	0.120		0.0400	0.0320								
Mar. 2003	8.8	1,000	61	9.160	294.00	68.00	< 0.100		0.0460	< 0.0200								
Oct. 2003	8.3	1,000	63	7.280	351.00	62.00	< 0.100		0.0630	< 0.0200								
Mar. 2004	8.0	>1000	60	7.730	240.00	71.00	< 0.100		0.0320	< 0.0200								
Oct. 2004	8.7	>1000	60	10.000	281.00	61.00	< 0.100		0.0620	< 0.0200								
Mar. 2005	7.5	>1000	59	10.900	266.00	76.00	< 0.100		0.0450	< 0.0200								
Oct. 2005	7.4	>1000	61	10.900	293.00	74.00	< 0.100		0.0410	< 0.0200								
Mar. 2006	7.9	>1000	59	9.300	304.00	75.20	1.620		0.0351	< 0.0200								
Oct. 2006	8.2	>1000	63	9.130	274.00	63.00	0.100		0.0386	< 0.0200								
Mar. 2007	8.0	3,400	59	8.610	246.00	67.00	1.620		0.0308	< 0.0200								
Oct. 2007	7.6	3,650	66	9.170	245.00	64.60	0.147		0.0564	< 0.0180								
Mar. 2008	7.8	3,500	61	9.560	259.00	69.40	0.227		0.0321	< 0.0200								
Sep. 2008	7.3	3,700	64	11.400	327.00	105.00	0.111		0.2400	< 0.0180								
Mar. 2009	7.8	3,600	58	13.100	302.00	92.40	< 0.100		0.0126	< 0.0176								
Oct. 2009	7.5	3,600	62	13.000	253.00	65.70	0.112		0.0451	< 0.0200								
Apr. 2010	7.4	3,200	63	11.200	202.00	57.10	< 0.100		0.0517	< 0.0180	94.5				0.904	0.253		0.220
Oct. 2010	7.2	3,400	62	9.800	211.00	80.40	0.154		< 0.5000	< 0.0180	93.9				1.05	0.263		< 0.100
Apr. 2011	7.6	3,300	62	11.200	215.00	68.60	< 0.100		0.0541	< 0.0200	96.1				0.990	0.232		0.310
Oct. 2011	7.6	2,900	62	6.580	187.00	< 5.00	0.108		0.0682	< 0.0200	89.8				1.22	0.307		0.370
Apr. 2012	7.6	3,000	61	9.920	208.00	64.30	< 0.100		0.0722	< 0.0200	98.6				1.16	0.350		0.265
Oct. 2012	7.4	2,900	60	< 0.020	222.00	56.40	0.907		0.0722	< 0.0200	75.5				0.907	0.379		0.191
Apr. 2013	7.5	3,000	57	8.750	211.00	57.30	0.606		0.0824	< 0.0188	93.0				0.606	0.432		0.432
Oct. 2013	8.0	2,700	59	7.830	215.00	54.50	< 0.100		36.8000	< 0.0180	61.4				0.512	0.432		0.175
Jan. 2014									0.108									
Feb. 2014									0.0980									
Apr. 2014	8.0	2,800	57	6.46	221	48.4	0.121		0.113	< 0.0192	71.6				0.901	0.225		1.08
May. 2014									0.122									
Oct. 2014	8.1	2,500	58	6.43	191.00	38.40	< 0.100		0.109	< 0.0216	71.5				0.751	0.294		0.603
Apr. 2015	6.7	2,637	52	6.65	242.00	51.20	0.155				86.7			< 0.150	1.00	0.248		0.691

Table 9e: Combined Leachate Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

Sample Date	Parameters																	
	pH (field) Standard Units	Specific Conductance (field) µmhos	Temperature (field) °F	Ammonia Nitrogen mg/L	Chloride mg/L	Chemical Oxygen Demand mg/L	Iron (dissolved) mg/L	Iron (total) mg/L	Total Organic Halogen mg/L	Phenols mg/L	Magnesium (dissolved) mg/L	Magnesium (total) mg/L	Trichloroethylene mg/L	Selenium (dissolved) mg/L	Fluoride mg/L	Barium (dissolved) mg/L	Barium (total) mg/L	Nitrate mg/L
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Oct. 2015	8.2	1,642	60	2.21	167.00	45.10	0.220		0.185	< 0.0180	73.0				0.66	0.308		3.300
Apr. 2016	7.5	2,187	57	3.55	179	42.1	0.172		0.1200		62.7				0.793	0.373		1.15
Oct. 2016	7.5	2,441	55	3.49	174	54.9	< 0.100		0.0940	< 0.0196	61.4				0.675	0.368		1.13
Apr. 2017	7.5	2,168	56	4.06	157	15.5	< 0.500				53.6				0.729	0.365		1.20
Oct. 2017	7.5	1,900	61	5.52	144	27.2	< 0.500	2.49	0.053	< 0.0196	59.4	57.7			0.810	0.395	0.393	0.266
Apr. 2018	7.9	2,520	53	4.38	159	43.3	< 0.500	1.11			65.9	66.9			0.840	0.233	0.249	0.859
Oct. 2018	7.3	1,960	65	3.57	114	33.5	< 0.500	1.52		< 0.0192	62.5	57.4			0.675	0.255	0.260	0.906
Apr. 2019	7.1	2,342	57	3.30	174	49.6	< 0.500	1.28			67.7	66.2			1.060	0.233	0.286	2.35
Oct. 2019	7.0	2,582	53	5.81	130	48.8	< 0.500	2.86		< 0.0184	73.9	81.1			0.778	0.276	0.397	1.10
Apr. 2020	6.8	2,655	58	6.51	122	46.7		5.69				97.5			1.330		0.230	1.13
Oct. 2020	7.4	2,441	67	6.71	120	54.7		8.72		< 0.0184		88.2			1.460		0.523	< 0.10
Apr. 2021	7.5	2,514	62	6.69	116	54.7		5.04		< 0.0184		97.9			0.932		0.372	
Oct. 2021	7.4	2,448	63	7.08	112	49.2		2.27		< 0.0188		96.1			0.475		0.255	0.180
Apr. 2022	7.8	2,483	65	5.46	111	45.2		1.22				113.0			0.957		0.239	0.278
Oct. 2022	7.3	2,384	64	6.35	113	44.6		2.34		< 0.0200		93.6			< 0.100		0.319	0.258
Apr. 2023				6.98	114	56.6		< 2.50				90.9			0.906		0.350	0.554
Oct. 2023	7.9	2,234.7	63	5.79	108	53.1		2.14		< 0.0200		95.1			0.687		0.268	0.766
Apr. 2024	7.5	2,231.3	59	5.94	119	45.0		2.17				88.3			0.677		0.211	0.865
Oct. 2024	7.3	2,274.9	59	5.34	92	49.9		4.37		< 0.0208		93.3			1.020		0.317	0.894

Notes:
Qualifiers not included in table.

Updated By: L. Auner, 12/30/2024
Checked By: M. Holicky 1/10/2025

Table 9f: April and October 2024 Monitoring Results
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
Dubuque, Iowa

		Sample Type	Stage 1 Leachate/Underliner Liquid						Stage 2 Leachate/Underliner Liquid				Combined Leachate/Underliner Liquid		Groundwater								Equipment Blanks	
		Sample Location ID	S1 Leachate Open		S1 Underliner Open		S1 Underliner Closed		S2 Leachate Open		S2 Underliner Closed		Combined Leachate		MW-1		MW-2				MW-3		EB-01	EB-01
		Duplicate ID																Dup-01		Dup-01				
		Sample Date	4/11/2024	10/28/2024	4/11/2024	10/28/2024	4/12/2024	10/29/2024	4/11/2024	10/28/2024	4/12/2024	10/29/2024	4/11/2024	10/28/2024	4/11/2024	10/28/2024	4/11/2024	4/11/2024	10/28/2024	10/28/2024	4/11/2024	10/28/2024	4/11/2024	10/28/2024
Parameter Group	**Parameter**	**Units**																						
Field Parameters	pH	SU	7.84	7.12	7.63	7.33	8.37	7.02	7.35	7.27	7.74	7.26	7.51	7.3	7.43	7.43	7.15	-	7.14	-	7.23	7.10	-	-
	Specific conductance	umhos/cm	2793.2	1658.9	1154.7	1211.7	1153.8	1488	1592	3070.1	2892.2	3077	2231.3	2274.9	571.3	629.5	694.3	-	783.4	-	1191.6	1425.6	-	-
General Chemistry and Anions	Chloride	mg/L	115	79.8	80.9	60.2	85.7	74.9	134	107	132	376	119	92.4	5.68	4.82	8.30	8.26	7.58	7.5	80.9	112	<1.00	<1.00
	Fluoride	mg/L	0.443	0.562	0.311	0.456	0.302	0.64	0.829	1.02	0.701	1.41	0.677	1.02	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
	Nitrate as N	mg/L	<0.200	<0.200	2.97	2.54	1.77	0.967	<0.200	0.67	<0.200	1.24	0.865	0.894	<0.200	<0.200	1.39	1.41	1.52	1.53	<1.00	0.782	<0.200	<0.200
	Sulfate	mg/L	2.53	43.5	26.7	34.1	42.8	47.5	1190	1210	1170	1380	715	616	25.7	23.7	20.9	19.1	19.9	19.6	126	119	<1.00	<1.00
	Ammonia as N	mg/L	4.98	3.67	<0.500	<0.500	<0.500	2.02	9.79	8.4	8.63	8.06	5.94	5.34	<0.200 UJ	<0.200	<0.200 UJ	<0.200 UJ	<0.200	<0.200	<0.200 UJ	<0.200	<0.200	<0.200
	Chemical Oxygen Demand	mg/L	27.4	31.8	17.7	18.8	28.3	27.4	68.9	71.9	74.9	69.4	45.0	49.9	<5.00	12.3	<5.00	<5.00	<5.00	<10.0	5.56	<10.0	<5.00	<5.00
	Total Dissolved Solids	mg/L	952	938	706	694	700	880	2510	2330	2160	2250	2010	1510	360	340	418	398	424	408	734	810	<50.0	<50.0
Metals	Barium, total	mg/L	0.869	0.88	0.696	0.642	0.496	0.677	0.0268	0.0299	0.0321	0.0359	0.211	0.317	0.0770	0.0853	0.0825	0.0780	0.0857	0.0867	0.0455	0.0628	<0.0100	<0.0100
	Boron, total	mg/L	8.19	8.9	3.01	3.72	3.87	8.1	22.1	22.5	22.1	22.7	15.2	15.7	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	2.26	2.35	<0.200	<0.200
	Calcium, total	mg/L	115	133	86.8	92.2	71.1	123	159	181	166	190	134	158	67.2	68.8	97.6	92.7	101	100	122	129	<1.00	<1.00
	Iron, total	mg/L	8.66	9.01	<0.500	<0.500	<0.500	6.42	2.88	1.2	2.58	3.06	2.17	4.37	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	Lithium, total	mg/L	0.210	0.198	0.0679	0.0743	0.0970	0.192	1.14	1.12	1.13	1.13	0.695	0.651	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
	Magnesium, total	mg/L	44.8	41.3	42.6	38	41.4	41.9	126	143	126	149	88.3	93.3	38.5	37.9	41.6	39.5	42.1	43.2	55.6	59.2	<1.00	<1.00
	Molybdenum, total	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.0565	0.0547	0.0522	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Organics	Phenols, total	mg/L	-	<0.0200	-	<0.0212	-	<0.0200	-	<0.0220	-	<0.0212	-	<0.0208	-	<0.0200	-	<0.0216	-	<0.0200	-	<0.0200	-	<0.0200

Notes:
- = Not analyzed or not applicable
UJ = estimated nondetect

Prepared by: L. Auner, 1/9/2024
Checked by: M. Holicky 1/10/2024

Table 10: Historic SSI and SSL since January 1, 2021
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Constituent	Spring 2021	Fall 2021	Spring 2022	Fall 2022	Spring 2023	Fall 2023	Spring 2024	Fall 2024
MW-2	Chloride								
	Nitrate, as nitrogen								
	Specific conductance								*
MW-3	Chloride								
	Nitrate, as nitrogen								
	Magnesium								
	Specific conductance								

Key:

SSI

SSL

* Result was above background level. If next sample is also above background level, an SSI will be identified.

Updated by: L. Auner, 12/30/2024

Checked by: M. Holicky 1/10/2025

Notes:

1. Evaluation of SSIs and SSLs began with the 2021 AWQR.

Table 11: Corrective Action Trend Analysis
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Well	Current SSL	Trend	N	Projected Year to Completion
NA				

Notes:

N - Number of Samples

NA - Table not applicable; this facility is not under corrective action monitoring.

Table 12: Leachate Management Summary
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

First Day of Measurements for Event[1]	Elevation of Saturated Waste (ft)		Height of Saturated Waste above Liner (ft)		Leachate Drain Line Flow Rate (gpm)		Underliner Drain Line Flow Rate with LCS Valves Open (gpm)		Underliner Drain Line Flow Rate with LCS Valves Closed (gpm)		Volume of Leachate Discharged to NPDES #008 Since Last Measurement Date	Notes	Monthly Precipitation[3]
	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2[2]	Stage 1	Stage 2	(gal)		(in)
11/27/2023	<789.06	797.34	-	16.54	0.52	0.95	0.06	0	0.06	0.17	129,989		0.34
12/20/2023	<789.02	793.9	-	13.1	0.45	0.95	0.04	0	0.04	0.16	78,185		1.8
1/22/2024	<788.67	793.86	-	13.06	0.4	0.97	0.03	0	0.03	0.16	100,850		0.68
2/15/2024	<788.67	793.86	-	13.06	0.38	0.90	0.03	0	0.03	0.14	75,797		0.6
3/25/2024	<788.67	794.01	-	13.21	0.44	0.92	0.05	0	0.05	0.14	117,627	Jetting 3/26/2024.[4]	2.67
4/22/2024	<788.67	793.76	-	12.96	0.54	0.91	0.11	0	0.11	0.24	101,481		5.52
5/23/2024	789.26	788.68	2.16	7.88	0.89	0.93	0.19	0	0.23	0.83	131,028		5.78
6/10/2024	789.52	793.86	2.42	13.06	1.24	0.93	0.21	0	0.27	0.91	74,192		7.6
7/9/2024	789.24	791.28	2.14	10.48	1.76	1.02	0.24	0	1.01	0.92	204,839		5.77
8/28/2024	790.01	794.66	2.91	13.86	1.84	1.06	0.18	0	0.20	0.96	328,545	Jetting 8/19/2024.[5]	2.6
9/27/2024	789.34	791.36	2.24	10.56	1.4	1.16	0.15	0	1.08	1.08	199,727		0.71
10/7/2024	788.65	794.96	1.55	14.16	1.27	1.15	0.19	0	0.85	1.15	60,824		3.06
Annual Total											**1,603,084**		**37.13**

Notes:
LCS = leachate collection system
- = not measured or not applicable

Prepared by: L. Auner, 1/9/2024
Checked by: M. Holicky 1/10/2025

Footnotes:
[1] Measurements were made over the course of two days. Measurements of leachate drain line flow rates, underliner drain line flow rates with LCS valves open, and volume of leachate discharged were made on Day 1. Other measurements were made on Day 2.
[2] No flow was observed during monthly monitoring, consistent with historical observations.
[3] Monthly precipitation based on calendar month (not aligned with leachate measurement dates).
[4] Jetting on March 26, 2024 was performed for leachate drain lines for Stage 1 and Stage 2.
[5] Jetting on August 19, 2024 was performed for leachate drain lines for Stage 1 and Stage 2, the Stage 2 vertical standpipe, and part of the Stage 1 vertical standpipe.

Table 13: Gas Monitoring Summary
2024 Annual Water Quality Report
John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C

Monitoring Points			Methane Results (% LEL)			
Name	**Type**	**Description**				
NA						

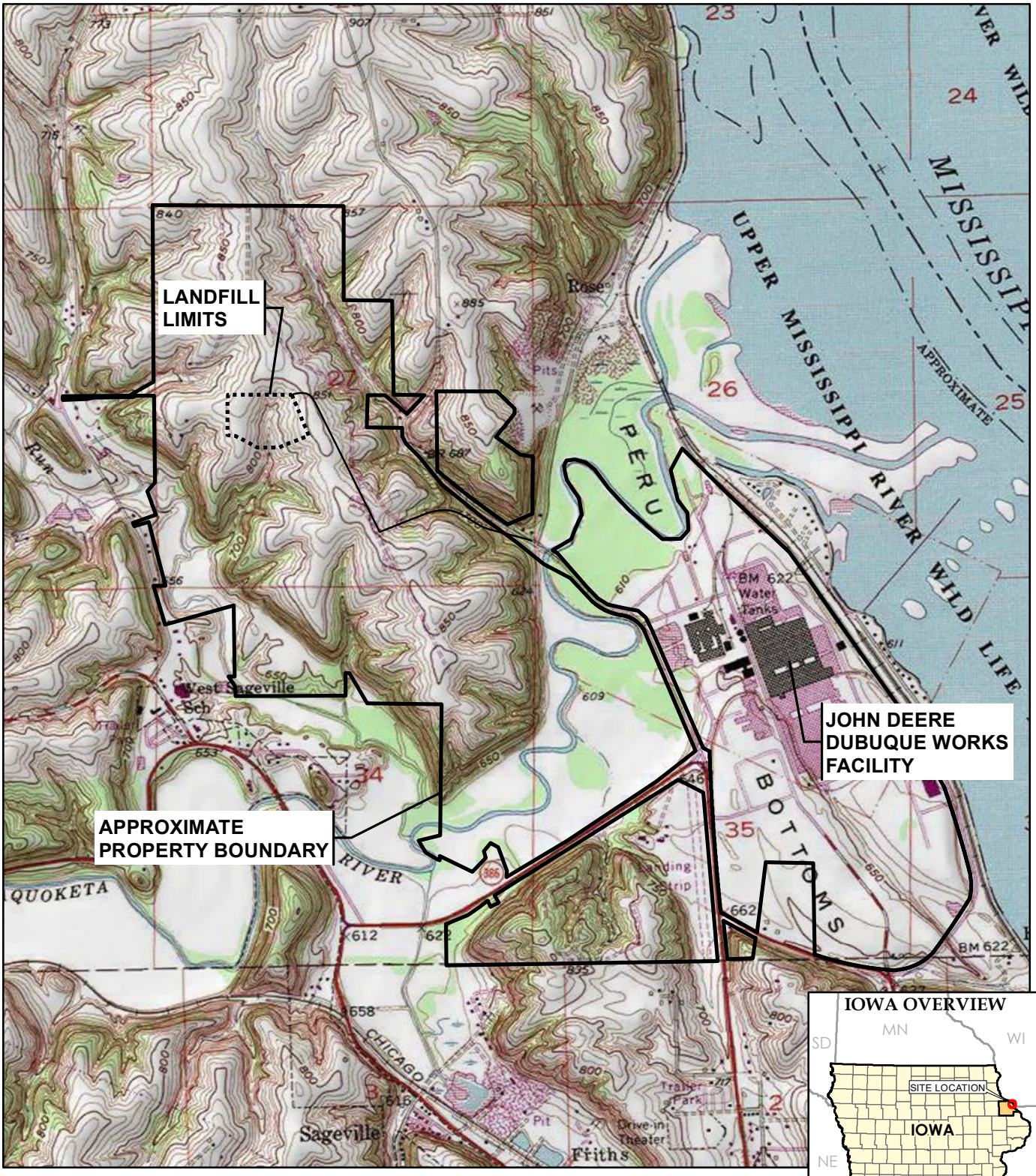
Notes:

NA - Table not applicable, gas monitoring is not conducted at this facility.

Saved By: AFOJTIK on 1/9/2025, 08:37:57 AM

T:\1-PROJECTS\John_Deere\630113_Dubuque\630113-001slm.mxd

TRC - GIS



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 2,000 '
1:24,000

0 2,000 4,000 FEET

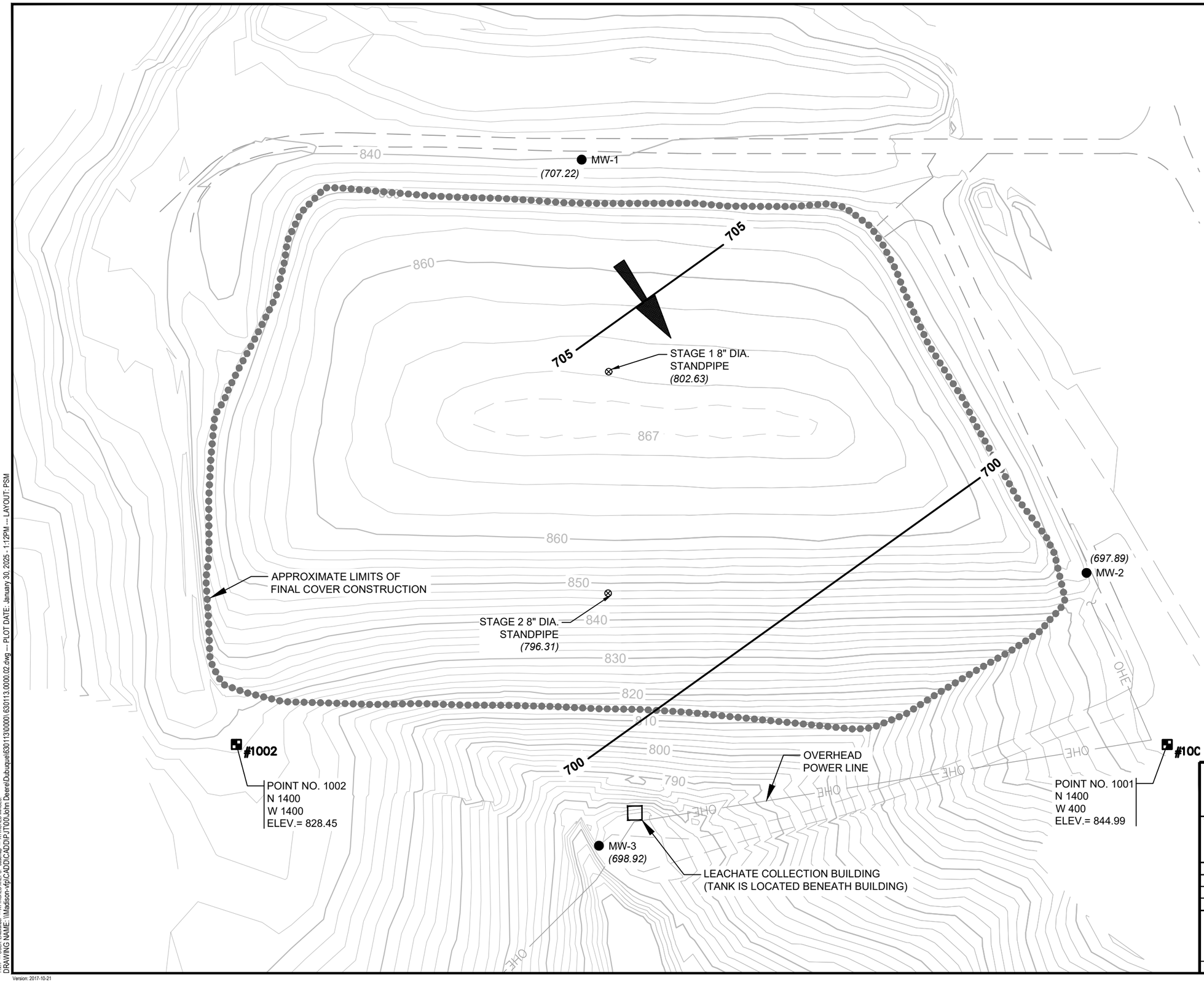
TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3663

JOHN DEERE DUBUQUE WORKS
DUBUQUE, IOWA

SITE LOCATION MAP

DRAWN BY:	A. FOJTIK
APPROVED BY:	E. LAWSON
PROJECT NO:	630113
FILE NO.	630113-001slm.mxd
DATE:	JANUARY 2025

FIGURE 1



LEGEND

- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- 840 EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- LIMITS OF FINAL COVER CONSTRUCTION
- #1002 EXISTING SURVEY CONTROL MONUMENT
- MW-3 (703.30) EXISTING MONITORING WELL LOCATION AND WATER ELEVATION
- (802.72) LEACHATE STANDPIPE AND ELEVATION OF SATURATED WASTE
- GROUNDWATER FLOW DIRECTION
- 705 GROUNDWATER CONTOUR (5' INTERVAL)

NOTES

1. BASE MAP DEVELOPED FROM PLAN SHEET PROVIDED BY JOHN DEERE DUBUQUE WORKS. INFORMATION TO DEFINE THE PROJECT GRID SYSTEM AND DATE OF SURVEY WAS NOT AVAILABLE.
2. WELL LOCATIONS ARE APPROXIMATE.
3. GROUNDWATER ELEVATIONS MEASURED BY TRC ON APRIL 11, 2024.
4. ELEVATIONS OF SATURATED WASTE MEASURED BY TRC ON APRIL 12, 2024.

N

0 100 200

SCALE IN FEET

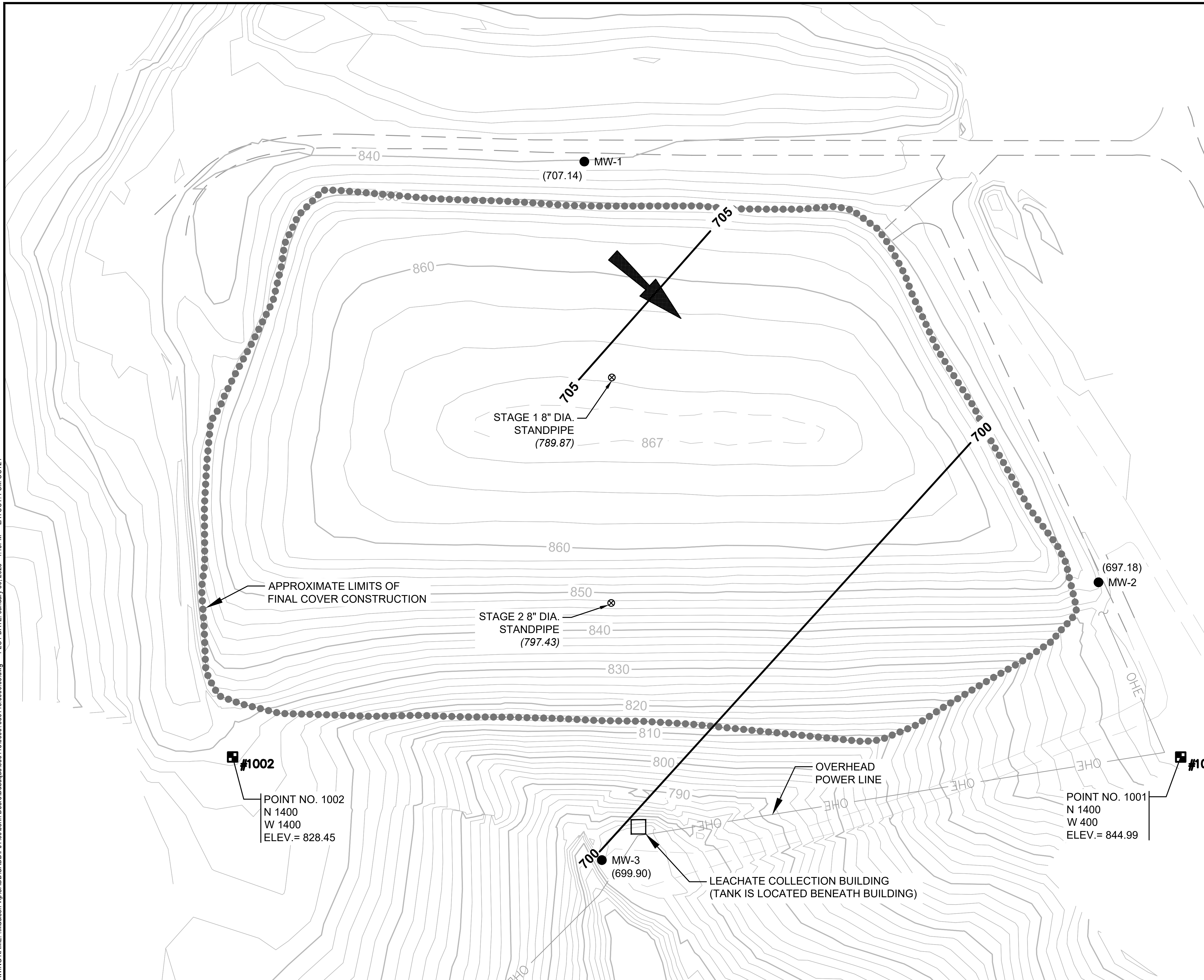
PROJECT:
JOHN DEERE DUBUQUE WORKS LANDFILL
DUBUQUE, IOWA

TITLE:
POTENTIOMETRIC SURFACE MAP (APRIL 2024)

DRAWN BY:	E. ALEXANDER	PROJ NO.:	630113.0000.0000
CHECKED BY:	L. AUNER		
APPROVED BY:	E. LAWSON		**FIGURE 2**
DATE:	JANUARY 2025		

TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 630113.0000.02.dwg



LEGEND

- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- 840 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- LIMITS OF FINAL COVER CONSTRUCTION
- #1002 — EXISTING SURVEY CONTROL MONUMENT
- MW-3 (703.30) — EXISTING MONITORING WELL LOCATION AND WATER ELEVATION
- ⊗ *(793.17)* — LEACHATE STANDPIPE AND ELEVATION OF SATURATED WASTE
- GROUNDWATER FLOW DIRECTION
- 705 — GROUNDWATER CONTOUR (5' INTERVAL)

NOTES

1. BASE MAP DEVELOPED FROM PLAN SHEET PROVIDED BY JOHN DEERE DUBUQUE WORKS. INFORMATION TO DEFINE THE PROJECT GRID SYSTEM AND DATE OF SURVEY WAS NOT AVAILABLE.
2. WELL LOCATIONS ARE APPROXIMATE.
3. GROUNDWATER ELEVATIONS MEASURED BY TRC ON OCTOBER 28, 2024.
4. ELEVATIONS OF SATURATED WASTE MEASURED BY TRC ON OCTOBER 29, 2024.

N

0 100 200

SCALE IN FEET

PROJECT:

JOHN DEERE DUBUQUE WORKS LANDFILL
DUBUQUE, IOWA

TITLE:

POTENTIOMETRIC SURFACE MAP (OCTOBER 2024)

DRAWN BY:	E. ALEXANDER	PROJ NO.:	630113.0000.0000
CHECKED BY:	L. AUNER	FIGURE 3	
APPROVED BY:	E. LAWSON		
DATE:	JANUARY 2025		

TRC
999 Fourier Drive
Suite 101
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 630113.0000.03.dwg

11x17 --- USER: EAlexander --- ATTACHED XREFS: basemap --- ATTACHED IMAGES:
DRAWING NAME: \\Madison-vfp\CADD\CADD\PJT\00\John Deere\Dubuque\630113\0000\630113.0000.03.dwg --- PLOT DATE: January 30, 2025 - 1:13PM --- LAYOUT: PSM OCT24

Version: 2017-10-21

Appendix A: Correspondence

August 7, 2024

DAN MAI
JOHN DEERE DUBUQUE WORKS
18600 SOUTH JOHN DEERE ROAD
DUBUQUE IA 52001

RE: John Deere Dubuque Works Landfill
Permit No. 31-SDP-01-75C
2023 Annual Water Quality Report (Document No. 109010) and Hydrologic Monitoring System Plan (Documents No. 109761)

Dear Mr. Mai:

The Iowa Department of Natural Resources (DNR) has reviewed the 2023 Annual Water Quality Report (AWQR), dated January 2024, as submitted by TRC Environmental Corporation (TRC). Our comments on the AWQR are below.

1. Report Priority Items

No priority items were requested in the report.

2. Groundwater Monitoring

a. The Closure Permit was amended on August 17, 2023 to include supplemental sampling and analysis for additional constituents (sulfate, total dissolved solids [TDS], total boron, total calcium, total lithium, and total molybdenum) as requested in the DNR's 2022 AWQR Comment Letter (Doc #107430). These constituents were present in all leachate and underliner samples taken. The similarity in the leachate and underliner sample results suggests that leachate has migrated to the underliner layer. Although no levels were above the statewide standards in the downgradient monitoring wells MW-2 and MW-3, MW-2 showed elevated levels of total dissolved solids (420 mg/L), while MW-3 was elevated in chloride (75.9 mg/L), sulfate (121 mg/L), and total dissolved solids (730 mg/L) above that observed in the upgradient background monitoring well MW-1, which has corresponding concentrations of chloride (4.78 mg/L), sulfate (28.4 mg/L), and total dissolved solids (330 mg/L). Since sulfate, chloride, and total dissolved solids can be an indicator of leachate migration, this affirms that continued sampling of these additional constituents is appropriate.

b. Chloride, sulfate, barium, boron, calcium, magnesium, and total dissolved solids were observed in wells MW-1, MW-2, and MW-3, but all were below statewide standards. No other constituents were observed above minimum laboratory detection levels in these wells.

c. Due to missing pH, specific conductance, chloride, and other parameters that were not recorded during the April 2023 sampling event a clear trend could not be determined for the reporting period. The permit holder is reminded that recording of all required field data is a requirement of your permit and the regulations. Please ensure all data is properly recorded during future events.

d. No changes to monitoring were proposed by TRC. DNR agrees with this statement.

e. DNR further reviewed the proposed Hydrologic Monitoring System Plan (Doc #109761) and agrees with all proposed changes. This will be incorporated into the permit under separate cover.

3. Leachate Control System

a. Televising revealed a blockage in Stage 1 standpipe about 80 feet below the ground surface that appeared to be gravel, which is from the gravel pack around the standpipe, and that entered the standpipe by way of a breach. The Stage 2 leachate drain line had gravel and sediment encountered upon removal of the PVC fitting, and the gravel and sediment encountered were removed.

b. No other debris, damage, or obstructions were noted, and it appears that neither of the noted situations negatively impacted operation of the leachate collection system. Therefore, the DNR concurs with continuing to monitor, operate, and report in accordance with the permit and applicable rules

Feel free to contact me with any questions at (515) 415-1331 or by email at brad.davison@dnr.iowa.gov.

Sincerely,

Brad Davison
Environmental Specialist
Land Quality Bureau

copy: Erica Lawson
TRC Environmental Corporation
999 Fourier Drive, Suite 101
Madison, WI 53717

DNR Field Office #1 – Manchester

Appendix B: Field Notes

- Spring 2024 Sampling Forms and Facility Inspection Report
- Fall 2024 Sampling Forms and Facility Inspection Report

Sampling Forms and Facility Inspection Report
Spring 2024

PROJECT NAME:	JDDW
PROJECT NUMBER:	577511
PROJECT MANAGER:	Erica Lawson
SITE LOCATION:	Dubuque, IA
DATES OF FIELDWORK:	4/11/2024 - 4/12/2024
PURPOSE OF FIELDWORK:	Semiannual groundwater sampling, facility inspection, and leachate sampling and measurements
WORK PERFORMED BY:	Maddie Holicky, Adam Jannke, Wes Braga

Maddie Holicky — SIGNED — 1/10/2025 — DATE

LA — CHECKED BY — 1/13/25 — DATE

GENERAL NOTES

PROJECT NAME: JDDW	DATE: 4/11/2024	TIME ARRIVED: 8:00
PROJECT NUMBER: 577511	AUTHOR: M. Holicky	TIME LEFT: 14:00

WEATHER		
TEMPERATURE: 50 °F	WIND: 10 MPH	VISIBILITY: Clear

WORK / SAMPLING PERFORMED
Arrive on site, check in with JDDW security at north gate
Drive to landfill behind JDDW facility
Gauging for MW-1, MW-2, MW-3, and Stage 1 and Stage 2 standpipes
Calibrate water quality meter
Sample MW-1, MW-2, and MW-3
Landfill cap inspection
Leachate and underliner sampling (while leachate valves open). Stage 1 underliner not flowing, as typical.

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
None	

COMMUNICATION		
NAME	REPRESENTING	SUBJECT / COMMENTS
Erica Lawson	TRC (PM)	Notifed of arrival and depature from site

Maddie Holicky 1/10/2025

SIGNED DATE

LA 1/13/25

CHECKED BY DATE

GENERAL NOTES

PROJECT NAME: JDDW	DATE: 4/12/2024	TIME ARRIVED: 8:30
PROJECT NUMBER: 577511	AUTHOR: M. Holicky	TIME LEFT: 12:00

WEATHER		
TEMPERATURE: 50 °F	WIND: 15 MPH	VISIBILITY: Clear

WORK / SAMPLING PERFORMED
Arrive on-site and check in at north gate security
Collect leachate level measurements in Stage 1 and Stage 2 standpipes
Wait one hour to check leachate levels to see if stabilization occurred
Collected S1 and S2 underliner closed samples and parameters

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
Leachate level measurements at Stage 1 were not stable after one hour	Waited an extra hour for stabilization

COMMUNICATION		
NAME	REPRESENTING	SUBJECT / COMMENTS
Erica Lawson	TRC (PM)	Notified of arrival and departure

Maddie Holicky 1/10/2025

SIGNED DATE

LA 1/13/25

CHECKED BY DATE

TRC

WATER QUALITY METER CALIBRATION LOG

LA, 12/26/24

PROJECT NAME: JDDW	MANUF: InSitu	MODEL: TRC	SAMPLER: Wesley Braga
PROJECT NO.: 577511	OWNER: AquaTROLL 600	SER #: 1069460	DATE: 4/11/24 - 4/12/24

PH METER

CALIBRATION			POST SAMPLING CALIBRATION CHECK			
pH 4	pH 7	TIME	pH 4	pH 7	TIME	DATE
☐ WITHIN RANGE	☑ WITHIN RANGE	9:44	N/A	7.00	14:02	4/11/24
☐ WITHIN RANGE	☑ WITHIN RANGE	6:27	N/A	7.00	12:45	4/12/24
☐ WITHIN RANGE	☐ WITHIN RANGE					
☐ WITHIN RANGE	☐ WITHIN RANGE					
☐ WITHIN RANGE	☐ WITHIN RANGE					

CONDUCTIVITY METER

CALIBRATION			POST SAMPLING CALIBRATION CHECK			
STANDARD		TIME	CHECK	TEMP	TIME	DATE
8050 µS/cm	☑ WITHIN RANGE	9:41	7747 µS/cm	20.85 °C	14:02	4/11/24
8050 µS/cm	☑ WITHIN RANGE	6:24	7921 µS/cm	20.21 °C	12:45	4/12/24
µS/cm	☐ WITHIN RANGE		µS/cm	°C		
µS/cm	☐ WITHIN RANGE		µS/cm	°C		
µS/cm	☐ WITHIN RANGE		µS/cm	°C		

DO METER

CALIBRATION	TIME	CALIBRATION	TIME	DATE
☑ WITHIN RANGE	9:30	☑ WITHIN RANGE	14:00	4/11/24
☑ WITHIN RANGE	6:15	☑ WITHIN RANGE	12:42	4/12/24
☐ WITHIN RANGE		☐ WITHIN RANGE		
☐ WITHIN RANGE		☐ WITHIN RANGE		
☐ WITHIN RANGE		☐ WITHIN RANGE		

ORP METER

CALIBRATION	TIME	POST SAMPLING CALIBRATION CHECK			
		CHECK	TEMP	TIME	DATE
☑ WITHIN RANGE	9:35	235.4 mV	20.85 °C	14:02	4/11/24
☑ WITHIN RANGE	6:18	238.6 mV	21.42 °C	12:45	4/12/24
☐ WITHIN RANGE		mV	°C		
☐ WITHIN RANGE		mV	°C		
☐ WITHIN RANGE		mV	°C		

TURBIDITY CALIBRATION CHECK

METER TYPE: Hach 2100P

PRE-SAMPLING CALIBRATION CHECK								
GEL 1 LABEL (NTU)	GEL 1 READING (NTU)	GEL 2 LABEL (NTU)	GEL 2 READING (NTU)	GEL 3 LABEL (NTU)	GEL 3 READING (NTU)	WITHIN 5%?	TIME	DATE
5.58	5.61	53.7	53.9	501	503	~~503~~ ✓	14:00	4/11/24
5.58	5.61	53.7	53.9	501	503	~~503~~ ✓	12:55	4/12/24

LA, 12/26/24

Autocal Solution Lot#:	NA	Exp Date:	N/A
pH 7 Soultion Lot#:	NA	Exp Date:	N/A
ORP Solution Lot#:	NA	Exp Date:	N/A

Parameters Calibrated: ☑ pH ☑ Conductivity ☑ Turbidity ☑ ORP ☑ Dissolved Oxygen

NOTES

Used Insitu AutoCal solution for ORP, pH and Cond. One-point pH calibration instead of 2.

DATE	PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 4/19/24 DATE

Checked LA 1/13/25 DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	JDDW Semi-Annual Sampling - Spring 2024	DATE:	4/11/24
PROJECT NUMBER:	577511	AUTHOR:	WB/AJ/MH

WELL LOCATION	TIME	REFERENCE ELEVATION (TOP OF PVC CASING)	DEPTH TO WATER (FT BTOC)	DEPTH TO BOTTOM (FT BTOC)*	TOTAL DEPTH BASED ON CONSTRUCTION (FT BTOC)	SCREENED INTERVAL (FT BTOC)	WATER ELEVATION (FT)
MW-1	9:01	842.05	134.83	198.80	198.78	168.78 - 198.78	707.22
MW-2	8:50	848.49	150.60	196.08	196.72	166.72 - 196.72	697.89
MW-3	8:45	774.06	75.14	127.08	127.06	97.06 - 127.06	698.92

Remember to include the tape correction factor for depth to bottom measurements, if applicable.

Maddie Holicky 1/10/2025
SIGNED DATE

CHECKED 4/19/24
DATE

6/16
3RT

TRC LOW-FLOW WATER SAMPLE LOG

PROJECT NAME:	JDDW Spring 2024	PREPARED		CHECKED	
PROJECT NUMBER:	577511	BY: WB/AJ	DATE: 4/11/24	BY: LA	DATE: 1/13/25
SAMPLE ID:	MW-1	WELL DIAMETER:	5 in		
WELL MATERIAL:	☑ PVC ☐ SS ☐ GS ☐ IRON			☐ OTHER:	
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI		☐ LEACHATE	☐ OTHER:	

PURGING	TIME: 11:51	DATE: 04/11/24	SAMPLE:	TIME: 12:20	DATE: 04/11/24
PUMP TYPE:	BLADDER PUMP (Non-Dedicated)		PH: 7.43 SU	CONDUCTIVITY: 571.3	umhos/cm
STABILIZATION CRITERIA:	EPA R5 (2021)		DO: 1.58 mg/l	ORP: 196.8 mV	
DEPTH TO WATER:	134.83 T/ PVC		TURBIDITY: 1.7 NTU		
DEPTH TO BOTTOM	198.80 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	247.00 ☑ LITERS ☐ GALLONS		TEMPERATURE: 12.87 °C	OTHER: --	
VOLUME REMOVED:	5.8 ☑ LITERS ☐ GALLONS		COLOR: None	ODOR: None	
COLOR:	None ODOR: None		FILTRATE (0.45 um) ☐ YES	☑ NO	
TURBIDITY			FILT COLOR:	FILT ODOR:	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: Man turb readings collected, AT600 tub not working		

TIME	PURGE RATE (mL/min)	TEMPERATURE (°C)	SPECIFIC CONDUCTIVITY (µS/cm)	D.O. (mg/L)	pH (SU)	ORP (mV)	TURBIDITY (NTU)	WATER LEVEL (ft btoc)	CUMULATIVE PURGE VOLUME (L)
Stabilization Criteria									
	100 mL/min-500 mL/min	None	3%	10% or 0.2 mg/L, whichever is greater (optional)	±0.1	±10 mV (optional)	within 10%, or <10 NTU	<0.1 ft	
11:51	200	12.58	571.3	2.36	7.52	171.5	NR	134.83	0.00
11:56	200	12.61	572.1	2.02	7.51	177.5	NR	NR	1.00
12:00	200	12.83	572.2	1.81	7.49	182.8	NR	NR	1.80
12:05	200	12.75	573.9	1.70	7.46	187.4	NR	135.37	2.80
12:10	200	12.71	573.2	1.67	7.44	191.1	1.9	135.40	3.80
12:15	200	12.68	573.0	1.61	7.43	194.8	1.8	135.41	4.80
12:20	200	12.87	571.3	1.58	7.43	196.8	1.7	135.42	5.80

BOTTLES FILLED

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250mL	AMB	H_2SO_4	☐ ☑ N	1	1L	CLR	None	☐ ☑ N
1	250mL	CLR	HNO_3	☐ ☑ N					☐ ☐
1	250mL	CLR	None	☐ ☑ N					☐ ☐

SHIPPING METHOD: FedEx	DATE SHIPPED: 4/11/24	
	SIGNATURE: [signature]	DATE SIGNED: 4/11/24

Groundwater Sampling Field Sheet

Site Name:	**John Deere Dubuque Works**	Permit No.:	**31-SDP-01-75**
Well/Piezometer:	**MW-1**	Weather:	Sunny
Date:	4/11/2024	Sampler:	WB/AJ

Monitoring Well Construction Information

Borehole diameter (in):	8	Ground surface elevation (ft. MSL):	840.33
Casing Diameter (in):	5	Top of Casing elevation (ft. MSL):	842.05
Casing material:	PVC	Depth to top of screen (ft TOC):	168.78

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	134.83	135.42	135.42
Water Elevation (ft. MSL)	707.22	706.63	706.63

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	198.78	198.80	-0.02

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment:	Pump
Equipment Name & Description:	Sample Pro Bladder Pump
Pump Type:	Submersible Pump
Dedicated/Disposable/Portable:	Portable
Decontamination for pump:	Alconox wash, DI water rinse
Tubing (Dedicated/Disposable):	Dedicated
Purge Method:	Low-flow

Sample Info

Equipment depth (ft. TOC)	184
Flow Rate (mL/min):	200
Volume purged (L):	5.8
Volume sampled (L):	1.75
Odor? (Y/N)	None
Color? (Y/N)	None

Comments:

TRC LOW-FLOW WATER SAMPLE LOG

PROJECT NAME:	JDDW Spring 2024			PREPARED		CHECKED	
PROJECT NUMBER:	577511			BY: AJ	DATE: 4/11/24	BY: LA	DATE: 1/13/25
SAMPLE ID:	MW-2			WELL DIAMETER:	5 in		
WELL MATERIAL:	☑ PVC	☐ SS	☐ GS	☐ IRON		☐ OTHER:	
SAMPLE TYPE:	☑ GW	☐ WW	☐ SW	☐ DI	☐ LEACHATE	☐ OTHER:	

PURGING	TIME: 13:00	DATE: 04/11/24		SAMPLE:	TIME: 13:30	DATE: 04/11/24	
PUMP TYPE:	BLADDER PUMP (Non-Dedicated)			PH: 7.15 SU	CONDUCTIVITY: 694.3	umhos/cm	
STABILIZATION CRITERIA:	EPA R5 (2021)			DO: 4.02 mg/l	ORP: 210.9	mV	
DEPTH TO WATER:	150.60 T/ PVC			TURBIDITY: 3.90 NTU			
DEPTH TO BOTTOM	196.08 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			
WELL VOLUME:	175.60 ☑ LITERS	☐ GALLONS		TEMPERATURE: 14.76 °C	OTHER: --		
VOLUME REMOVED:	6.0 ☑ LITERS	☐ GALLONS		COLOR: None	ODOR: None		
COLOR:	None	ODOR: None		FILTRATE (0.45 um) ☐ YES	☑ NO		
TURBIDITY				FILT COLOR:	FILT ODOR:		
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY				QC SAMPLE: ☐ MS/MSD	☑ DUP- 01		
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:			

TIME	PURGE RATE (mL/min)	TEMPERATURE (°C)	SPECIFIC CONDUCTIVITY (µS/cm)	D.O. (mg/L)	pH (SU)	ORP (mV)	TURBIDITY (NTU)	WATER LEVEL (ft btoc)	CUMULATIVE PURGE VOLUME (L)
	Stabilization Criteria								
	100 mL/min-500 mL/min	None	3%	10% or 0.2 mg/L, whichever is greater (optional)	±0.1	±10 mV (optional)	within 10%, or <10 NTU	<0.1 ft	
13:00	200	24.61	0.1	8.07	10.08	237.4	0.0	150.60	0.0
13:05	200	16.66	711.2	4.28	7.24	199.9	1.7	150.60	1.0
13:10	200	15.35	710.7	4.01	7.26	197.8	NR	150.60	2.0
13:15	200	14.66	712.8	3.78	7.24	201.2	NR	150.60	3.0
13:20	200	14.38	713.3	4.05	7.22	206.1	3.4	150.60	4.0
13:25	200	14.14	707.2	4.02	7.18	207.9	3.6	150.60	5.0
13:30	200.000	14.76	694.3	4.02	7.15	210.9	3.9	150.60	6.0

BOTTLES FILLED

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250mL	CLP1	H_2SO_4	☐ ☑ N	2	1L	CLP1	None	☐ ☑ N
2	250mL	CLP1	HNO_3	☐ ☑ N					☐ ☐
2	250mL	CLP1	None	☐ ☑ N					☐ ☐

SHIPPING METHOD: FedEx	DATE SHIPPED: 4/11/24		
	SIGNATURE: [signature]	DATE SIGNED:	4/19/24

Groundwater Sampling Field Sheet

Site Name:	**John Deere Dubuque Works**	Permit No.:	**31-SDP-01-75**
Well/Piezometer:	**MW-2**	Weather:	Sunny
Date:	4/11/2024	Sampler:	WB/AJ

Monitoring Well Construction Information

Borehole diameter (in):	8	Ground surface elevation (ft. MSL):	846.71
Casing Diameter (in):	5	Top of Casing elevation (ft. MSL):	848.49
Casing material:	PVC	Depth to top of screen (ft TOC):	166.72

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	150.60	150.6	150.6
Water Elevation (ft. MSL)	697.89	697.89	697.89

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	196.72	196.08	0.64

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment:	Pump
Equipment Name & Description:	Sample Pro Bladder Pump
Pump Type:	Submersible Pump
Dedicated/Disposable/Portable:	Portable
Decontamination for pump:	Alconox wash, DI water rinse
Tubing (Dedicated/Disposable):	Disposable
Purge Method:	Low-flow

Sample Info

Equipment depth (ft. TOC)	182
Flow Rate (mL/min):	200
Volume purged (L):	6
Volume sampled (L):	3.5
Odor? (Y/N)	None
Color? (Y/N)	None

Comments:

TRC LOW-FLOW WATER SAMPLE LOG

PROJECT NAME:	JDDW Spring 2024		PREPARED		CHECKED		
PROJECT NUMBER:	577511		BY: AJ/WB	DATE: 4/11/24	BY: LA	DATE: 1/13/25	
SAMPLE ID:	MW-3		WELL DIAMETER:	5 in			
WELL MATERIAL:	☑ PVC	☐ SS	☐ GS	☐ IRON	☐ OTHER:		
SAMPLE TYPE:	☑ GW	☐ WW	☐ SW	☐ DI	☐ LEACHATE	☐ OTHER:	

PURGING	TIME: 10:05	DATE: 04/11/24	SAMPLE:	TIME: 10:38	DATE: 04/11/24
PUMP TYPE:	BLADDER PUMP (Non-Dedicated)		PH: 7.23 SU	CONDUCTIVITY: 1191.6	umhos/cm
STABILIZATION CRITERIA:	EPA R5 (2021)		DO: 0.27 mg/l	ORP: 248.7	mV
DEPTH TO WATER:	75.14 T/ PVC		TURBIDITY: 3.29 NTU		
DEPTH TO BOTTOM	127.08 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	200.55 ☑ LITERS ☐ GALLONS		TEMPERATURE: 11.43 °C	OTHER: --	
VOLUME REMOVED:	8.3 ☑ LITERS ☐ GALLONS		COLOR: None	ODOR: None	
COLOR:	None ODOR: None		FILTRATE (0.45 um) ☐ YES	☑ NO	
TURBIDITY			FILT COLOR:	FILT ODOR:	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (mL/min)	TEMPERATURE (°C)	SPECIFIC CONDUCTIVITY (µS/cm)	D.O. (mg/L)	pH (SU)	ORP (mV)	TURBIDITY (NTU)	WATER LEVEL (ft btoc)	CUMULATIVE PURGE VOLUME (L)
	Stabilization Criteria								
	100 mL/min-500 mL/min	None	3%	10% or 0.2 mg/L, whichever is greater (optional)	±0.1	±10 mV (optional)	within 10%, or <10 NTU	<0.1 ft	
10:05	250	11.42	1205.3	0.67	6.99	253.3	NR	75.14	0.0
10:10	250	11.36	1199.2	0.46	7.07	253.6	NR	NR	1.3
10:15	250	11.39	1194.3	0.38	7.08	254.0	NR	NR	2.5
10:20	250	11.33	1194.1	0.35	7.13	251.2	NR	NR	3.8
10:25	250	11.39	1189.9	0.32	7.19	250.7	NR	75.98	5.0
10:28	250	11.42	1188.7	0.30	7.20	248.9	3.42	76.01	5.8
10:33	250	11.44	1191.1	0.28	7.22	248.9	3.35	76.03	7.0
10:38	250	11.43	1191.6	0.27	7.23	248.7	3.29	76.05	8.3

BOTTLES FILLED

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250mL	CIPI	H_2SO_4	☐ ☑ N	1	1L	CIPI	None	☐ ☑ N
1	250mL	CIPI	HNO_3	☐ ☑ N					☐ ☐
1	250mL	CIPI	None	☐ ☑ N					☐ ☐

SHIPPING METHOD: FedEx	DATE SHIPPED: 4/11/24	
	SIGNATURE: [signature]	DATE SIGNED: 4/19/24

Groundwater Sampling Field Sheet

Site Name: **John Deere Dubuque Works** Permit No.: **31-SDP-01-75**
Well/Piezometer: **MW-3** Weather: Sunny
Date: 4/11/2024 Sampler: WB/AJ

Monitoring Well Construction Information

Borehole diameter (in): 8
Casing Diameter (in): 5
Casing material: PVC
Ground surface elevation (ft. MSL): 772.26
Top of Casing elevation (ft. MSL): 774.06
Depth to top of screen (ft TOC): 97.06

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	75.14	76.05	76.05
Water Elevation (ft. MSL)	698.92	698.01	698.01

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	127.06	127.08	-0.02

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment: Pump
Equipment Name & Description: Sample Pro Bladder Pump
Pump Type: Submersible Pump
Dedicated/Disposable/Portable: Portable
Decontamination for pump: Alconox wash, DI water rinse
Tubing (Dedicated/Disposable): Disposable
Purge Method: Low-flow

Sample Info

Equipment depth (ft. TOC) 112
Flow Rate (mL/min): 250
Volume purged (L): 8.25
Volume sampled (L): 1.75
Odor? (Y/N) None
Color? (Y/N) None

Comments:

WATER SAMPLE LOG

PROJECT NAME: JDWW Spring 2024			PREPARED		CHECKED
PROJECT NUMBER: **577511**		BY: **WB**	DATE: **4/11/24**	BY: LA	DATE: 1/13/25
SAMPLE ID: **EB-01**		WELL DIAMETER: NA			
WELL MATERIAL: ☐ PVC ☐ SS ☐ GS ☐ IRON				☑ OTHER: **N/A**	
SAMPLE TYPE: ☐ GW ☐ WW ☐ SW ☑ DI			☐ LEACHATE	☐ OTHER:	
PURGING START	TIME:	DATE: **04/11/24**	SAMPLE:	TIME: **13:55**	DATE: **04/11/24**
SAMPLE METHOD: ☐ PUMP ☐ BAILER ☐ PASSIVE			PH: **NM** SU	CONDUCTIVITY: **NM** umhos/cm	
			DO: **NM** mg/l	ORP: **NM** mV	
			TURBIDITY: **NM** NTU		
DEPTH TO WATER: T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
DEPTH TO BOTTOM: T/ PVC			TEMPERATURE: **NM** °C	OTHER	
WELL VOLUME: ☐ LITERS ☐ GALLONS			COLOR: **None**	ODOR: **None**	
VOLUME REMOVED: ☐ LITERS ☐ GALLONS			FILTRATE (0.45 um) ☐ YES ☑ NO		
COLOR: ODOR:			FILT COLOR: FILT ODOR:		
TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER			COMMENTS: Collected by pouring distilled water over bladder pump following decontamination		

BOTTLES FILLED

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	CLR PLST	None	☐ Y ☑ N	1	1 L	CLR PLST	None	☐ Y ☑ N
1	250 mL	CLR PLST	H2SO4	☐ Y ☑ N					☐ Y ☐ N
1	250 ml	CLR PLST	HNO3	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD: FedEx	DATE SHIPPED: 4/11/24	
	SIGNATURE:	DATE SIGNED: 4/19/24

Leachate and Underliner Sampling Summary

Site Name	John Deere Dubuque Works	Project #:	577511		
Permit No:	31-SDP-01-75	Prepared by:	MH	Date:	4/12/2024
Weather:	Cloudy 50F	Checked by:	WB	Date:	4/19/2024
Sampler:	MH				

Sample Summary

Sample ID	Sample Date	Sample Time	pH (SU)	Conductivity (umhos/cm)	DO (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	Color	Odor
S1 Leachate Open	4/11/2024	11:09	7.84	2793.2	8.32	-36.7	16.03	16	Clear	None
S2 Leachate Open	4/11/2024	11:04	7.35	1592	5.05	-48.6	15.52	14	Clear	None
S1 Underliner Open	4/11/2024	10:46	7.63	1154.7	8.51	225.9	13.32	7	Clear	None
S2 Underliner Open	No Flow	--	--	--	--	--	--	--	--	--
S1 Underliner Closed	4/12/2024	11:50	8.37	1153.8	10.01	227.9	13.76	16	Clear	None
S2 Underliner Closed	4/12/2024	11:44	7.74	2892.2	8.9	145.6	15.75	13.4	Clear	None
Combined Leachate	4/11/2024	11:21	7.51	2231.3	5.56	114.7	15.12	28	Clear	None

Notes on Sample IDs

S1 = Stage 1 — Open = sample collected while leachate valves open

S2 = Stage 2 — Closed = sample collected while leachate valves closed

Sampling Methods:	Stage 1 and Stage 2 leachate and underliner samples collected from drains in leachate building. Combined Leachate sample collected from combined leachate sample tap in leachate building.
Equipment:	Stage 1 and Stage 2 leachate and underliner samples collected into new, disposable 1-gallon collapsible jugs prior to being poured into laboratory-provided sample containers. Combined Leachate sample collected directly from tap, no equipment used.
Decontamination	Not applicable, only disposable equipment used.

Bottles Filled for Each Sample

Method(s)	Number	Size (mL)	Type	Preservative	Filtered?
EPA 9056A	1	250	CLR PLST	None	No
EPA 350.1	1	250	CLR PLST	H2SO4	No
EPA 6010C	1	250	CLR PLST	HNO3	No
EPA 2540C	1	1000	CLR PLST	None	No

Total sample volume (mL): 1750

Additional Comments

JDDW Landfill - Leachate Flow and Standpipe Measurements

Recorded by: M.Holicky

Flow Totalizer Measurement		
Total gallons pumped to X-18 discharge	Date	Time
8597200	4/11/2024	10:16

Flow Measurements - Leachate and Underliner Drains

Leachate Drain Valve Status	Drain	Date	Start Time	Volume Filled (L)	Time to Fill (sec)			Avg. Time (sec)	Avg. Flow (gpm)
					Test 1	Test 2	Test 3		
Open (Day 1)	Stage 1 Leachate	4/11/2024	10:20	1.35	33	35	34	34.00	0.63
	Stage 2 Leachate	4/11/2024	10:18	1.35	24	24	24	24.00	0.89
	Stage 1 Underliner	4/11/2024	10:23	1.35	247	253	253	251.00	0.09
	Stage 2 Underliner	4/11/2024	--	--	--	--	--	--	0
Closed (Day 2)	Stage 1 Underliner	4/12/2024	11:30	1.35	208	223	216	215.67	0.10
	Stage 2 Underliner	4/12/2024	11:40	1.35	25	38	28	30.33	0.71

Standpipe and Liner Elevations

	Stage 1	Stage 2
Top of Standpipe Elevation (ft):	869.32	850.76
Synthetic Liner Elevation (ft):	787.1	780.8

Standpipe Depth to Leachate Measurements

Leachate Drain Valve Status	Standpipe	Date	Time	Depth to Leachate (ft btoc)	Change in Depth to Leachate (ft)	Depth to Bottom (ft btoc)
Open	Stage 1	4/11/2024	9:08	~~79.52~~	--	83.87
Closed		4/12/2024	10:07	66.69	--	--
		4/12/2024	11:07	66.69	0	--
						--
Open	Stage 2	4/11/2024	9:10	~~54.45~~	--	73.13
Closed		4/12/2024	9:11	54.54	--	--
		4/12/2024	10:11	54.45	-0.09	--
						--

Notes:

1. If change in depth to leachate is <0.1 ft after 1 hour, level is considered stable. If not <0.1 ft, remeasure at 1 hr intervals until change is <0.1 ft.
2. If obstruction is encountered, note that an obstruction was encountered and the depth to the obstruction.
3. The measurements crossed out in red are measurements are due to condensation of leachate on standpipe walls. Waited for 1 extra hour for stabilization and collected another round of readings.

TRC

Facility Inspection Report
John Deere Dubuque Works Landfill – Dubuque, Iowa
Permit No. 31-SDP-01-75C

Date 4/11/2024	Name of Inspector M. Holicky

Description of Weather:

Time	Temperature	Precipitation
1300	50-60	none
Weather Conditions	**Ground Conditions**	**General Past 7-Day Weather Conditions**
fair - sunny	dry	rainy / sunny / snow

Final Cover:

General Health of Vegetation:

Healthy ☑ Stressed ☐ Barren ☐

Comments:

Density of Vegetation:

Good ☑ Fair ☐ Poor ☐

Comments:

Evidence of Burrowing Animals:	Comments:
No ☐ Yes ☑	• several field mice burrows throughout landfill cover
Erosion of Landfill Cap:	**Comments:**
No ☑ Yes ☐	
Settlement of Landfill Cap:	**Comments:**
No ☑ Yes ☐	
Drainage Ditch Erosion:	**Comments:**
No ☑ Yes ☐	
Leachate Seeps Identified:	**Comments:**
No ☑ Yes ☐	

John Deere Dubuque Works Landfill – Dubuque, Iowa
Facility Inspection Report
Page 2

Site Features:	
Fence Secure:	**Comments:**
No ☐ Yes ☑	
Gates and Locks Secure:	**Comments:**
No ☐ Yes ☑	
Signs Present:	**Comments:**
No ☐ Yes ☑	
Access Road Accessible:	**Comments:**
No ☐ Yes ☑	
Storm Water Diversion Structures Operating:	**Comments:**
No ☐ Yes ☑	

Leachate Collection System:

Standpipe #	Condition	Comments
Stage 1 (north)	Adequate ☐ Requires Maintenance ☑	· needs new cover
Stage 2 (south)	Adequate ☐ Requires Maintenance ☑	· needs new cover

Groundwater Monitoring Wells:

Well #	Condition	Comments
MW-1 (north)	Adequate ☑ Requires Maintenance ☐	
MW-2 (east)	Adequate ☑ Requires Maintenance ☐	
MW-3 (south)	Adequate ☑ Requires Maintenance ☐	

Survey Control Monuments:

Monument #	Condition	Comments
1001 (SE)	Adequate ☑ Requires Maintenance ☐	
1002 (SW)	Adequate ☑ Requires Maintenance ☐	

Sampling Forms and Facility Inspection Report
Fall 2024

PROJECT NAME:	John Deere Dubuque Works
PROJECT NUMBER:	630113
PROJECT MANAGER:	Erica Lawson
SITE LOCATION:	Dubuque, IA
DATES OF FIELDWORK:	10/28/24 - 10/29/2024
PURPOSE OF FIELDWORK:	Semiannual groundwater monitoring, leachate monitoring, and landfill cap inspection
WORK PERFORMED BY:	Maddie Holicky, Wes Braga

10/29/2024

SIGNED DATE

LA 1/13/25

CHECKED BY DATE

GENERAL NOTES

PROJECT NAME: John Deere Dubuque Works	DATE: 10/28/2024	TIME ARRIVED: 8:15
PROJECT NUMBER: 630113	AUTHOR: M. Holicky	TIME LEFT: 16:00

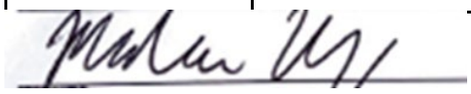
WEATHER		
TEMPERATURE: 60 °F	WIND: 10 MPH	VISIBILITY: Clear

WORK / SAMPLING PERFORMED
0910 to 0930: Gauge groundwater monitoring wells and stage 1 and stage 2 leachate standpipes.
1100: Start sampling MW-3, calibrated water quality meter and turbidity meter prior to sampling.
1120 to 1140: Leachate/underliner flow measurements and sampling (S1/S2 Leachate Open, S1 Underliner, Combined Leacha
1210: Closed wet valves for leachate.
1230-1500: Sampling MW-1 and MW-2. Dup-01 collected at MW-2.
1435: EB-01 collected.
1700: Drop off cooler at FedEx.

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Erica Lawson	TRC (PM)	Notified of arrival and departure. Checked chain of custody before Fedex



10/29/2024

SIGNED DATE

LA 1/13/25

CHECKED BY DATE

GENERAL NOTES

PROJECT NAME: John Deere Dubuque Works	DATE: 10/29/2024	TIME ARRIVED: 9:00
PROJECT NUMBER: 630113	AUTHOR: M. Holicky	TIME LEFT: 14:00

WEATHER

TEMPERATURE: 60 °F WIND: 10 MPH VISIBILITY: Clear

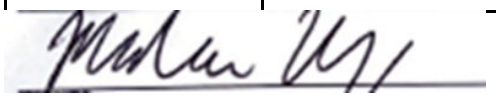
WORK / SAMPLING PERFORMED

0930: Gauge S1 and S2 leachate standpipes after leachate drain valves closed since 12:10 the day prior (10/28)
0940: Landfill cap inspection
1030: Re-gauge S1 and S2 standpipes to check stabilization
1100: Sample S1 and S2 underliner (closed)
1115: Update E. Lawson on standpipe readings, including potential issue with S1 leachate (closed) depth to leachate.
1200: Redo gauging of S1 standpipe.
1215: Open Stage 2 and stage 1 leachate valves, wait for flow to return to the same rate as it was on day 1 (10/28/24).
1245: Flow returns to the same as it was on Day 1.
1250: Remeasure Stage 2 (open) depth to leachate using lowest sensitivity and makeshift protector for sensor.

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
Water level meter thought to be detecting moisture on side of standpipe walls during Stage 1 (closed) measurement.	Created makeshift protector for sensor and adjusted to lowest sensitivity before remeasuring Stage 1 (closed) depth to leachate.
Initial measurement of Stage 2 (open) depth to leachate thought to be inaccurate.	Re-did measurement for Stage 2 (open) on Day 2 after reopening valve and waiting for flow to return to the same as on Day 1.

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Erica Lawson	TRC (PM)	See notes above regarding problems for depth to leachate measurements.



10/29/2024

SIGNED DATE

LA 1/13/25

CHECKED BY DATE

Groundwater Sampling Field Sheet

Site Name:	**John Deere Dubuque Works**	Permit No.:	**31-SDP-01-75**
Well/Piezometer:	**MW-1**	Weather:	60 °F, sunny
Date:	10/28/2024	Sampler:	M. Holicky

Monitoring Well Construction Information

Borehole diameter (in):	8	Ground surface elevation (ft. MSL):	840.33
Casing Diameter (in):	5	Top of Casing elevation (ft. MSL):	842.05
Casing material:	PVC	Depth to top of screen (ft TOC):	168.78

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	134.46	135.02	135.02
Water Elevation (ft. MSL)	707.59	707.03	707.03

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	198.78	198.72	0.06

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment:	Pump
Equipment Name & Description:	Sample Pro Bladder Pump
Pump Type:	Submersible Pump
Dedicated/Disposable/Portable:	Portable
Decontamination for pump:	Alconox wash, DI water rinse
Tubing (Dedicated/Disposable):	Disposable
Purge Method:	Low-flow

Sample Info

Equipment depth (ft. TOC)	184
Flow Rate (mL/min):	150
Volume purged (L):	4.5
Volume sampled (L):	2.25
Odor? (Y/N)	No
Color? (Y/N)	No

Comments:

Groundwater Sampling Field Sheet

Site Name:	**John Deere Dubuque Works**	Permit No.:	**31-SDP-01-75**
Well/Piezometer:	**MW-2**	Weather:	60 °F, sunny
Date:	10/28/2024	Sampler:	M. Holicky

Monitoring Well Construction Information

Borehole diameter (in):	8	Ground surface elevation (ft. MSL):	846.71
Casing Diameter (in):	5	Top of Casing elevation (ft. MSL):	848.49
Casing material:	PVC	Depth to top of screen (ft TOC):	166.72

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	149.96	150.70	150.70
Water Elevation (ft. MSL)	698.53	697.79	697.79

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	196.72	196.72	0.00

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment:	Pump
Equipment Name & Description:	Sample Pro Bladder Pump
Pump Type:	Submersible Pump
Dedicated/Disposable/Portable:	Portable
Decontamination for pump:	Alconox wash, DI water rinse
Tubing (Dedicated/Disposable):	Disposable
Purge Method:	Low-flow

Sample Info

Equipment depth (ft. TOC)	182
Flow Rate (mL/min):	150
Volume purged (L):	4.5
Volume sampled (L):	4.5
Odor? (Y/N)	No
Color? (Y/N)	No

Comments: Dup-01 collected here

Groundwater Sampling Field Sheet

Site Name:	**John Deere Dubuque Works**	Permit No.:	**31-SDP-01-75**
Well/Piezometer:	**MW-3**	Weather:	60 °F, sunny
Date:	10/28/2024	Sampler:	M. Holicky

Monitoring Well Construction Information

Borehole diameter (in):	8	Ground surface elevation (ft. MSL):	772.26
Casing Diameter (in):	5	Top of Casing elevation (ft. MSL):	774.06
Casing material:	PVC	Depth to top of screen (ft TOC):	97.06

Monitoring Well Field Observations

Locked (Y/N): Yes

	Before purging	After purging	Before sampling
Depth to water (ft. TOC):	74.16	75.25	75.25
Water Elevation (ft. MSL)	699.90	698.81	698.81

Screen submerged? (Y/N): Yes

	Constructed	Measured	Difference
Well Depth (ft. TOC)	127.06	127.06	0.00

Well conditions commentary: Good

Sampling Equipment

Type of Sampling Equipment:	Pump
Equipment Name & Description:	Sample Pro Bladder Pump
Pump Type:	Submersible Pump
Dedicated/Disposable/Portable:	Portable
Decontamination for pump:	Alconox wash, DI water rinse
Tubing (Dedicated/Disposable):	Disposable
Purge Method:	Low-flow

Sample Info

Equipment depth (ft. TOC)	112
Flow Rate (mL/min):	250
Volume purged (L):	13.1
Volume sampled (L):	2.25
Odor? (Y/N)	No
Color? (Y/N)	No

Comments:

JDDW Landfill - Leachate Flow and Standpipe Measurements

Recorded by: M. Holicky

Flow Totalizer Measurement		
Total gallons pumped to X-18 discharge	Date	Time
9744370	10/28/2024	1046

Flow Measurements - Leachate and Underliner Drains									
Leachate Drain Valve Status	Drain	Date	Start Time	Volume Filled (L)	Time to Fill (sec)			Avg. Time (sec)	Avg. Flow (gpm)
					Test 1	Test 2	Test 3		
Open (Day 1)	Stage 1 Leachate	10/28/2024	1045	1.35	120	125	121	122	0.18
	Stage 2 Leachate	-	No flow	-	-	-	-	-	0.00
	Stage 1 Underliner	10/28/2024	1055	1.35	15	16	17	16	1.34
	Stage 2 Underliner	10/28/2024	1057	1.35	17	17	17	17	1.26
Closed (Day 2)	Stage 1 Underliner	10/29/2024	1108	1.35	22	19	19	20	1.07
	Stage 2 Underliner	10/29/2024	1110	1.35	27	27	27	27	0.79

Standpipe and Liner Elevations		
	Stage 1	Stage 2
Top of Standpipe Elevation (ft):	869.32	850.76
Synthetic Liner Elevation (ft):	787.1	780.8

Standpipe Depth to Leachate Measurements						
Standpipe	Leachate Drain Valve Status	Date	Time	Depth to Leachate (ft btoc)	Change in Depth to Leachate (ft)	Depth to Bottom (ft btoc)
Stage 1	Open	10/28/2024	9:25	Obstruction at 80.91 ft btoc.		NM (obstruction)
	Closed	10/29/2024	9:31	~~66.51*~~	--	--
		10/29/2024	10:41	~~66.51*~~	--	--
		10/29/2024	12:00	79.45	--	--
Stage 2	Open	10/28/2024	9:30	~~70.25*~~	--	72.7
	Closed	10/29/2024	9:36	53.33	--	--
		10/29/2024	10:36	53.33	0	--
	Open	10/29/2024	12:50	72.70	--	--
						--

Notes:

1. If change in depth to leachate is <0.1 ft after 1 hour, level is considered stable. If not <0.1 ft, remeasure at 1 hr intervals until change is <0.1 ft.
2. If obstruction is encountered, note that an obstruction was encountered and the depth to the obstruction.

Notes from fieldwork:

* = Measurement believed to be inaccurate; was remeasured later. See notes below.

1. The original depth to leachate in the Stage 1 standpipe (with valves closed) was thought to be inaccurate, possibly due to the water lever meter detecting moisture on the side of the standpipe. This depth was remeasured on 10/29/2024 while the leachate control system valves were still closed. The water level meter was outfitted with a makeshift protector and the sensitivity level was adjusted before remeasuring.

2. The original depth to leachate in the Stage 2 standpipe (with valves open) was thought to be inaccurate. This depth was remeasured on 10/29/2024 after the leachate control system valves were reopened and flow returned to normal conditions, and after adding makeshift protector to water level meter and adjusting sensitivity level.

Leachate and Underliner Sampling Summary

Site Name	John Deere Dubuque Works	Project #:	630113		
Permit No:	31-SDP-01-75	Prepared by:	MH	Date:	10/28/24, 10/29/24
Weather:	60 °F, sunny	Checked by:	LA	Date:	1/13/2025
Sampler:	M. Holicky, W. Braga				

Sample Summary

Sample ID	Sample Date	Sample Time	pH (SU)	Conductivity (umhos/cm)	DO (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	Color	Odor
S1 Leachate Open	10/28/2024	11:30	7.12	1658.9	4.09	24.6	14.98	5.25	None	Leachate
S2 Leachate Open	10/28/2024	11:35	7.27	3070.1	6.32	133.6	15.55	4.8	None	Leachate
S1 Underliner Open	10/28/2024	11:20	7.33	1211.7	7.61	147.3	14.88	8.1	None	None
S2 Underliner Open	10/28/2024	-	-	-	-	-	-	-	-	-
S1 Underliner Closed	10/29/2024	11:05	7.02	1488	8.34	182.0	19.66	19.1	None	None
S2 Underliner Closed	10/29/2024	11:10	7.26	3077	7.25	61.7	18.38	5.05	None	None
Combined Leachate	10/28/2024	11:45	7.30	2274.9	5.98	73.1	14.95	44.5	Orange	Leachate

Notes on Sample IDs

S1 = Stage 1 — Open = sample collected while leachate valves open

S2 = Stage 2 — Closed = sample collected while leachate valves closed

Sampling Methods:	Stage 1 and Stage 2 leachate and underliner samples collected from drains in leachate building. Combined Leachate sample collected from combined leachate sample tap in leachate building.
Equipment:	Stage 1 and Stage 2 leachate and underliner samples collected into new, disposable 1-gallon collapsible jugs prior to being poured into laboratory-provided sample containers. Combined Leachate sample collected directly from tap, no equipment used.
Decontamination	Not applicable, only disposable equipment used.

Bottles Filled for Each Sample

Method(s)	Number	Size (mL)	Type	Preservative	Filtered?
EPA 305.1	1	250	Clear plastic	Sulfuric Acid (H2SO4)	No
EPA 9056A	1	250	Clear plastic	None	No
EPA 6010D	1	250	Clear plastic	Nitric Acid (HNO3)	No
EPA 2540C	1	1000	Clear plastic	Sulfric Acid (H2SO4)	No
EPA 9066	1	500	Amber glass	None	No
Total sample volume (mL):		2250			

Additional Comments

TRC MADISON GROUNDWATER SAMPLING NOTES

JDDW- Dubuque

ADDRESS: Dubuque, IA 52001

Final Signature:		QC Signature:	
Date Signed:	2025-01-10	Date Signed:	1/13/2025
		QC Reviewer:	L. Auner

TRC Environmental Corp.
999 Fourier Drive, Suite 101
Madison, WI 53717

DAILY NOTES

Project Information			
Project Name	JDDW- Dubuque	Project Manager	Erica Lawson
Project Number	630113	Location	Dubuque, IA

Sample Event Information			
Start of Field Work	2024-10-28	End of Field Work	2024-10-29
Purpose of Field Work	Sample Collection,Water Level Gauging	Sample Collection Methods	Low-Flow Stabilization

Daily Notes: 2024-10-28, **Arrival:** 08:30 **Departure:** 16:28		
Field Staff	Maddie Holicky,Wes Braga	
Work/Sampling Performed	Standpipe gauging, groundwater gauging, groundwater sampling	
Weather	Overcast, Temperature: 55°F, Wind: 13 mph	
Equipment Used	Turbidity Meter,WQM w/ Flow Cell	
Turbidimeter Calibration		
Turb Meter Type: Hach 2100 P (TRC)	SN: 0511CO14860	Rental: No
Check Within Range: Yes	Meter Recalibrated: N/A	
End of Day Turbidity Calibration Check		
Turbidity Gel Std 1: --	Turbidity Gel 1 Check: --	
Turbidity Gel Std 2: --	Turbidity Gel 2 Check: --	
Turbidity Gel Std 3: --	Turbidity Gel 3 Check: --	

WATER LEVEL MEASUREMENTS

Well ID	Ref. Elv. (MSL)	Date	Time	DTW (ft)	GW Elv. (MSL)	DTB (ft)	Screened Interval (ft bgs)	Product (ft)	Comments
MW-1	--	2024-10-28	09:20	134.91	--	198.78	--	--	
MW-2	--	2024-10-28	10:57	151.31	--	196.72	--	--	
MW-3	--	2024-10-28	09:13	74.16	--	127.06	--	--	

WATER SAMPLE LOG

Location ID: MW-1		Field Staff Initials: MH	
Location Type: Monitoring Well		Sample Type: Groundwater	
Sample Collection Method: Low-Flow Stabilization		Well Diameter: 5 in	Well Material: PVC
Location Notes:			
Purging	2024-10-28 14:27	Sample ID: MW-1	2024-10-28 14:57
Pump Type: Non-Ded Bladder	Material: Stainless Steel	Parameter Coll Meth: Low-flow Stabilization	
Model: QED SamplePRO		pH: 7.43 SU	Cond: 629.5 µS/cm
DTW (BTOC): 134.46 ft	DTB (BTOC): 198.78 ft	DO: 1.17 mg/L	ORP: 69.8 mV
Well Vol: 248.3 L	Vol. Removed: 4.5 L	Temperature: 12.05 °C	
Purge Color: None	Purge Odor: None	Turb: 3.12 NTU	Obs Turb: None
Initial Turbidity: None		Sample Color: None	Sample Odor: None
Stabilization Criteria: EPA		Filtered? (0.45um): No	
LF Attempted?: Yes	Went Dry?: No	Filtrate Color: --	Filtrate Odor: --
Disposal Method: Ground		QC Samples: --	QC ID: --
Comments:		Comments:	

Bottles Filled

Number	Size	Type	Preservative	Filtered
1	250 mL	CLEAR PLASTIC	Sulfuric Acid (H2SO4)	no
1	250 mL	CLEAR PLASTIC	None	no
1	250 mL	CLEAR PLASTIC	Nitric Acid (HNO3)	no
1	500 mL	AMBER GLASS	Sulfuric Acid (H2SO4)	no
1	1 L	CLEAR PLASTIC	None	no

Shipping Method:	FEDEX	Shipping Date:	2024-10-28

WATER SAMPLE LOG

Location ID: MW-2		Field Staff Initials: MH	
Location Type: Monitoring Well		Sample Type: Groundwater	
Sample Collection Method: Low-Flow Stabilization		Well Diameter: 5 in	Well Material: PVC
Location Notes:			
Purging	2024-10-28 12:53	Sample ID: MW-2	2024-10-28 13:23
Pump Type: Non-Ded Bladder	Material: Stainless Steel	Parameter Coll Meth: Low-flow Stabilization	
Model: QED Sample Pro		pH: 7.14 SU	Cond: 783.4 µS/cm
DTW (BTOC): 149.96 ft	DTB (BTOC): 196.72 ft	DO: 3.09 mg/L	ORP: 76.0 mV
Well Vol: 180.5 L	Vol. Removed: 4.5 L	Temperature: 12.54 °C	
Purge Color: None	Purge Odor: None	Turb: 1.64 NTU	Obs Turb: None
Initial Turbidity: None		Sample Color: None	Sample Odor: None
Stabilization Criteria: EPA		Filtered? (0.45um): No	
LF Attempted?: Yes	Went Dry?: No	Filtrate Color: --	Filtrate Odor: --
Disposal Method: Ground		QC Samples: Duplicate	QC ID: DUP-01
Comments:		Comments:	

Bottles Filled

Number	Size	Type	Preservative	Filtered
2	250 mL	CLEAR PLASTIC	Sulfuric Acid (H2SO4)	no
2	250 mL	CLEAR PLASTIC	None	no
2	500 mL	AMBER GLASS	Sulfuric Acid (H2SO4)	no
2	250 mL	CLEAR PLASTIC	Nitric Acid (HNO3)	no
2	1 L	CLEAR PLASTIC	None	no

Shipping Method:	FEDEX	Shipping Date:	2024-10-28

WATER SAMPLE LOG

Location ID: MW-3		Field Staff Initials: MH	
Location Type: Monitoring Well		Sample Type: Groundwater	
Sample Collection Method: Low-Flow Stabilization		Well Diameter: 5 in	Well Material: PVC
Location Notes:			
Purging	2024-10-28 10:37	Sample ID: MW-3	2024-10-28 11:33
Pump Type: Non-Ded Bladder	Material: Stainless Steel	Parameter Coll Meth: Low-flow Stabilization	
Model: QED SamplePRO		pH: 7.10 SU	Cond: 1425.6 µS/cm
DTW (BTOC): 74.16 ft	DTB (BTOC): 127.06 ft	DO: 0.23 mg/L	ORP: 98.1 mV
Well Vol: 204.3 L	Vol. Removed: 13.12 L	Temperature: 11.04 °C	
Purge Color: None	Purge Odor: None	Turb: 8.05 NTU	Obs Turb: None
Initial Turbidity: Slight		Sample Color: None	Sample Odor: None
Stabilization Criteria: EPA		Filtered? (0.45um): No	
LF Attempted?: Yes	Went Dry?: No	Filtrate Color: --	Filtrate Odor: --
Disposal Method: Ground		QC Samples: --	QC ID: --
Comments:		Comments:	

Bottles Filled

Number	Size	Type	Preservative	Filtered
1	250 mL	CLEAR PLASTIC	Sulfuric Acid (H2SO4)	no
1	250 mL	CLEAR PLASTIC	None	no
1	500 mL	AMBER GLASS	Sulfuric Acid (H2SO4)	no
1	250 mL	CLEAR PLASTIC	Nitric Acid (HNO3)	no
1	1 L	CLEAR PLASTIC	None	no

Shipping Method:	FEDEX	Shipping Date:	2024-10-28

SAMPLE SUMMARY

Sample ID	Date	Time	Color	Odor	Obs. Turb	Turb. (NTU)	Temp. (°C)	pH (SU)	Sp. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	QC ID
MW-1	2024-10-28	14:57	None	None	None	3.12	12.05	7.43	629.5	1.17	69.8	--
MW-2	2024-10-28	13:23	None	None	None	1.64	12.54	7.14	783.4	3.09	76.0	DUP-01
MW-3	2024-10-28	11:33	None	None	None	8.05	11.04	7.10	1425.6	0.23	98.1	--

Calibration Report

Instrument	Aqua TROLL 400
Serial Number	807539
Created	10/28/2024

Sensor	**RDO**
Serial Number	1069352
Last Calibrated	10/28/2024

Calibration Details

Slope	1.1899391
Offset	-0.00 mg/L

Calibration point 100%

Concentration	8.52 mg/L
Temperature	13.69 °C
Barometric Pressure	990.59 mbar

Sensor	**Conductivity**
Serial Number	807539
Last Calibrated	10/28/2024

Calibration Details

Offset	0.00 µS/cm
Cell Constant	1.002
Reference Temperature	25.00 °C
TDS Conversion Factor (ppm)	0.65

Sensor	**Level**
Serial Number	808453
Last Calibrated	Factory Defaults

Sensor	**pH/ORP**
Serial Number	22431
Last Calibrated	10/28/2024

Calibration Details

Total Calibration Points	2

Calibration Point 1

pH of Buffer	4.00 pH
pH mV	158.1 mV
Temperature	14.03 °C

Calibration Point 2

pH of Buffer	7.04 pH
pH mV	-6.5 mV
Temperature	14.34 °C

Slope and Offset 1

Slope	-54.15 mV/pH
Offset	-4.3 mV

ORP

ORP Solution	Zobell's
Offset	18.9 mV
Temperature	13.48 °C

Calibration Report

Instrument	Aqua TROLL 400
Serial Number	807539
Created	10/29/2024

Sensor	**RDO**
Serial Number	1069352
Last Calibrated	10/29/2024

Calibration Details

Slope	1.1472826
Offset	-0.00 mg/L

Calibration point 100%

Concentration	7.52 mg/L
Temperature	21.02 °C
Barometric Pressure	982.13 mbar

Sensor	**Conductivity**
Serial Number	807539
Last Calibrated	10/29/2024

Calibration Details

Offset	0.00 µS/cm
Cell Constant	1.02
Reference Temperature	25.00 °C
TDS Conversion Factor (ppm)	0.65

Sensor	**Level**
Serial Number	808453
Last Calibrated	Factory Defaults

Sensor	**pH/ORP**
Serial Number	22431
Last Calibrated	10/29/2024

Calibration Details

Total Calibration Points	2

Calibration Point 1

pH of Buffer	4.00 pH
pH mV	159.7 mV
Temperature	21.32 °C

Calibration Point 2

pH of Buffer	7.02 pH
pH mV	-7.6 mV
Temperature	21.57 °C

Slope and Offset 1

Slope	-55.42 mV/pH
Offset	-6.5 mV

ORP

ORP Solution	Zobell's
Offset	15.4 mV
Temperature	22.25 °C

Low-Flow Test Report:

Test Date / Time: 10/28/2024 2:27:49PM
Project: JDWW - DUBUQUE
Operator Name:

Location Name: MW-1 **Latitude: 42.57962005678564** **Longitude: -90.71575275622308**	**Flow Cell Volume: 90 ml** **Final Flow Rate: 150 ml/min**	**Instrument Used: Aqua TROLL 400** **Serial Number: 807539**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1		+/- 3 %		+/- 10 % or <10 NTU		+/- 0.1 ft	
10/28/2024 2:27PM	00:00	7.44 pH	18.31 °C	591.94 µS/cm	3.44 mg/L	2.72 NTU	93.0 mV	134.46 ft	150.00 ml/min
10/28/2024 2:32PM	05:00	7.42 pH	13.35 °C	623.30 µS/cm	1.74 mg/L	3.69 NTU	105.9 mV	134.82 ft	150.00 ml/min
10/28/2024 2:37PM	10:00	7.43 pH	12.66 °C	628.17 µS/cm	1.43 mg/L	3.69 NTU	77.5 mV	135.00 ft	150.00 ml/min
10/28/2024 2:42PM	15:00	7.43 pH	12.25 °C	628.07 µS/cm	1.32 mg/L	3.69 NTU	74.2 mV	135.01 ft	150.00 ml/min
10/28/2024 2:47PM	20:00	7.43 pH	12.14 °C	629.15 µS/cm	1.26 mg/L	3.27 NTU	72.0 mV	135.02 ft	150.00 ml/min
10/28/2024 2:52PM	25:00	7.43 pH	12.07 °C	629.39 µS/cm	1.21 mg/L	3.25 NTU	70.8 mV	135.02 ft	150.00 ml/min
10/28/2024 2:57PM	30:00	7.43 pH	12.05 °C	629.51 µS/cm	1.17 mg/L	3.12 NTU	69.8 mV	135.02 ft	150.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 10/28/2024 12:53:05PM
Project: JDWW - DUBUQUE
Operator Name:

Location Name: MW-2 **Latitude: 42.57847299333662** **Longitude: -90.71405533701181**	**Flow Cell Volume: 90 ml** **Final Flow Rate: 150 ml/min**	**Instrument Used: Aqua TROLL 400** **Serial Number: 807539**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1		+/- 3 %		+/- 10 %or <10 NTU		+/- 0.1 ft	
10/28/2024 12:53PM	00:00	7.34 pH	20.79 °C	13.16 µS/cm	8.82 mg/L	3.48 NTU	208.4 mV	149.96 ft	150.00 ml/min
10/28/2024 12:58PM	05:00	6.83 pH	14.64 °C	761.90 µS/cm	4.54 mg/L	3.48 NTU	123.2 mV	150.50 ft	150.00 ml/min
10/28/2024 1:03PM	10:00	6.98 pH	13.16 °C	780.73 µS/cm	3.55 mg/L	1.68 NTU	100.0 mV	150.70 ft	150.00 ml/min
10/28/2024 1:08PM	15:00	7.05 pH	12.93 °C	782.21 µS/cm	3.36 mg/L		89.0 mV	150.69 ft	150.00 ml/min
10/28/2024 1:13PM	20:00	7.10 pH	12.78 °C	782.57 µS/cm	3.18 mg/L		81.6 mV	150.69 ft	150.00 ml/min
10/28/2024 1:18PM	25:00	7.12 pH	12.67 °C	781.51 µS/cm	3.14 mg/L		78.9 mV	150.69 ft	150.00 ml/min
10/28/2024 1:23PM	30:00	7.14 pH	12.54 °C	783.43 µS/cm	3.09 mg/L	1.64 NTU	76.0 mV	150.70 ft	150.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 10/28/2024 10:40:26 AM
Project: JDDW_MW-3-202410
Operator Name: Wes Braga

Location Name: John Deere (MW-3) **Latitude: 42.5779364989778** **Longitude: -90.7160884514451** **Well Diameter: 5 in** **Casing Type: PVC** **Initial Depth to Water: 74.16 ft**	**Pump Type: Bladder** **Tubing Type: LDPE** **Estimated Total Volume Pumped: 13312.5 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 250 ml/min** **Final Draw Down: 1.09 ft**	**Instrument Used: Aqua TROLL 400** **Serial Number: 807539**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1		+/- 3 %		+/- 10 % or <10 NTU		+/- 0.1 ft	
10/28/2024 10:40 AM	00:00	6.77 pH	11.39 °C	1,422.1 µS/cm	0.65 mg/L	14.20 NTU	133.6 mV	74.16 ft	250.00 ml/min
10/28/2024 10:45 AM	05:00	6.94 pH	11.09 °C	1,431.9 µS/cm	0.46 mg/L	14.20 NTU	116.8 mV	74.45 ft	250.00 ml/min
10/28/2024 10:50 AM	10:00	7.01 pH	11.05 °C	1,433.6 µS/cm	0.36 mg/L	14.20 NTU	110.8 mV	74.65 ft	250.00 ml/min
10/28/2024 10:55 AM	15:00	7.04 pH	11.09 °C	1,432.2 µS/cm	0.32 mg/L	14.20 NTU	107.5 mV	74.89 ft	250.00 ml/min
10/28/2024 10:58 AM	18:15	7.05 pH	10.97 °C	1,435.1 µS/cm	0.31 mg/L	14.20 NTU	131.7 mV	75.18 ft	250.00 ml/min
10/28/2024 11:03 AM	23:15	7.06 pH	11.05 °C	1,432.7 µS/cm	0.28 mg/L	14.20 NTU	104.5 mV	75.23 ft	250.00 ml/min
10/28/2024 11:08 AM	28:15	7.07 pH	11.08 °C	1,431.7 µS/cm	0.26 mg/L	14.20 NTU	102.4 mV	75.24 ft	250.00 ml/min
10/28/2024 11:13 AM	33:15	7.08 pH	11.09 °C	1,430.5 µS/cm	0.25 mg/L	12.50 NTU	101.2 mV	75.25 ft	250.00 ml/min
10/28/2024 11:18 AM	38:15	7.09 pH	11.00 °C	1,430.7 µS/cm	0.25 mg/L	9.77 NTU	126.1 mV	75.25 ft	250.00 ml/min
10/28/2024 11:23 AM	43:15	7.10 pH	11.00 °C	1,429.6 µS/cm	0.24 mg/L	8.18 NTU	100.0 mV	75.25 ft	250.00 ml/min
10/28/2024 11:28 AM	48:15	7.10 pH	11.05 °C	1,428.3 µS/cm	0.24 mg/L	8.12 NTU	99.1 mV	75.25 ft	250.00 ml/min
10/28/2024 11:33 AM	53:15	7.10 pH	11.04 °C	1,425.6 µS/cm	0.23 mg/L	8.05 NTU	98.1 mV	75.25 ft	250.00 ml/min

Samples

Sample ID:	Description:

TRC

Facility Inspection Report
John Deere Dubuque Works Landfill – Dubuque, Iowa
Permit No. 31-SDP-01-75C

Date 10/29/24		Name of Inspector Maddie Holiday
Description of Weather:		
Time 9:40	**Temperature** 60°F	**Precipitation** N/A
Weather Conditions	**Ground Conditions**	**General Past 7-Day Weather Conditions**
partly cloudy	dry	sunny/windy

Final Cover:

General Health of Vegetation:

Healthy ☑ Stressed ☐ Barren ☐

Comments:

Density of Vegetation:

Good ☑ Fair ☐ Poor ☐

Comments:

Evidence of Burrowing Animals:	**Comments:**
No ☐ Yes ☑	field mice burrows throughout cover
Erosion of Landfill Cap:	**Comments:**
No ☑ Yes ☐	
Settlement of Landfill Cap:	**Comments:**
No ☑ Yes ☐	
Drainage Ditch Erosion:	**Comments:**
No ☑ Yes ☐	
Leachate Seeps Identified:	**Comments:**
No ☑ Yes ☐	

Site Features:	
Fence Secure:	**Comments:**
No ☐ Yes ☑	
Gates and Locks Secure:	**Comments:**
No ☐ Yes ☑	
Signs Present:	**Comments:**
No ☐ Yes ☑	
Access Road Accessible:	**Comments:**
No ☐ Yes ☑	
Storm Water Diversion Structures Operating:	**Comments:**
No ☐ Yes ☑	

Leachate Collection System:

Standpipe #	Condition	Comments
Stage 1 (north)	Adequate ☐ Requires Maintenance ☑	needs new cover
Stage 2 (south)	Adequate ☐ Requires Maintenance ☑	needs new cover

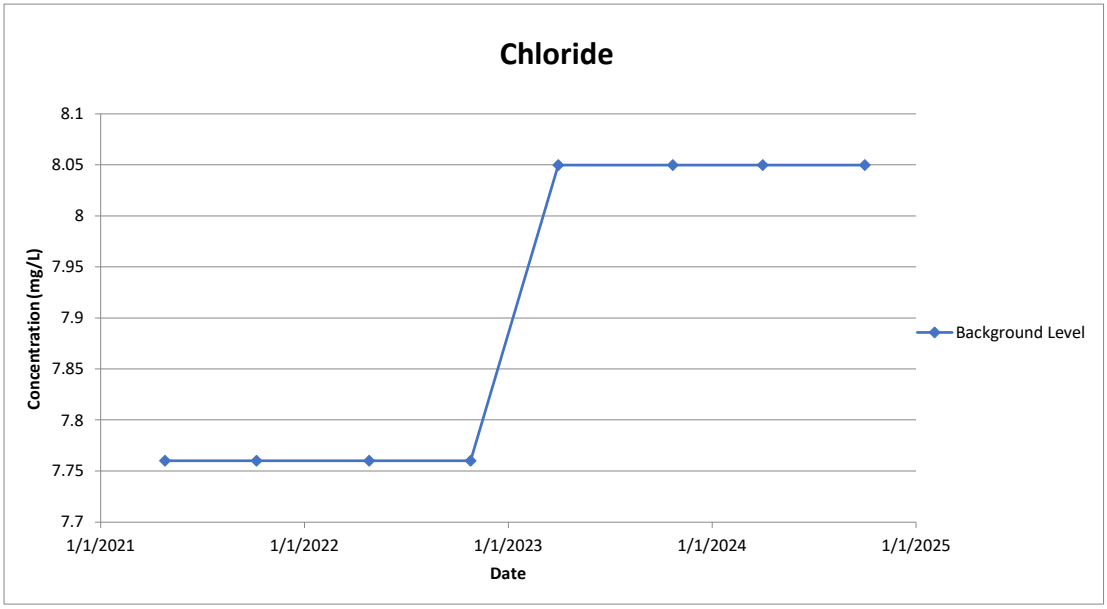
Groundwater Monitoring Wells:

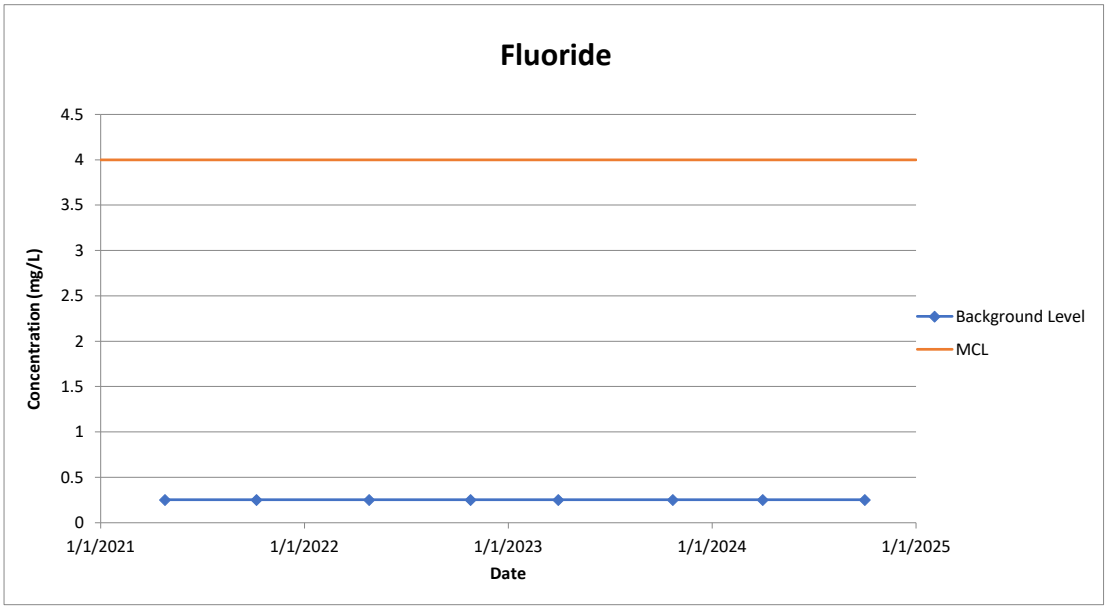
Well #	Condition	Comments
MW-1 (north)	Adequate ☑ Requires Maintenance ☐	
MW-2 (east)	Adequate ☑ Requires Maintenance ☐	
MW-3 (south)	Adequate ☑ Requires Maintenance ☐	

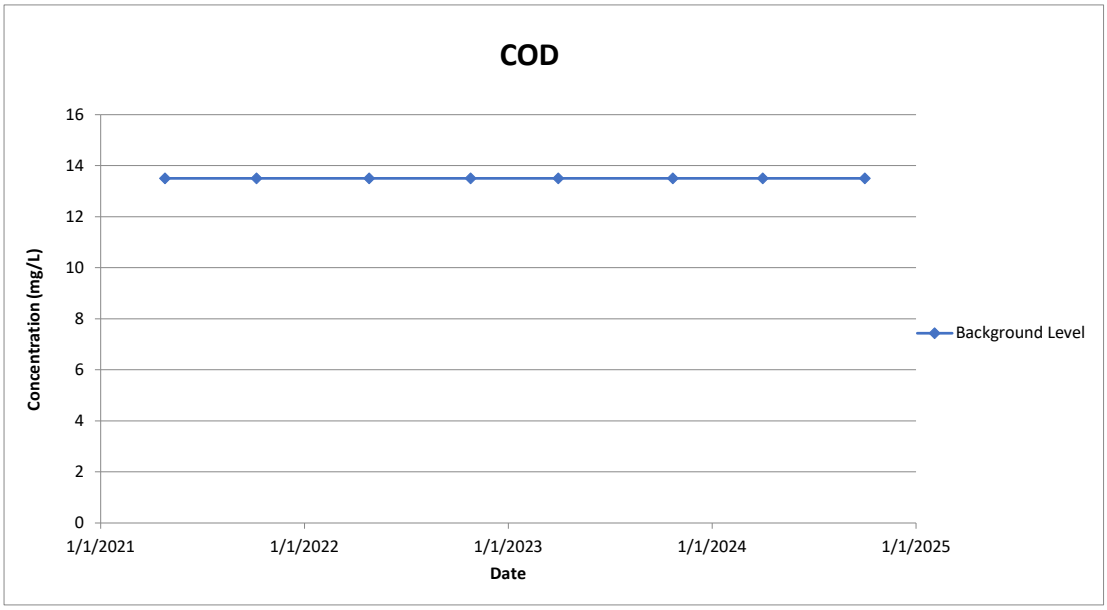
Survey Control Monuments:

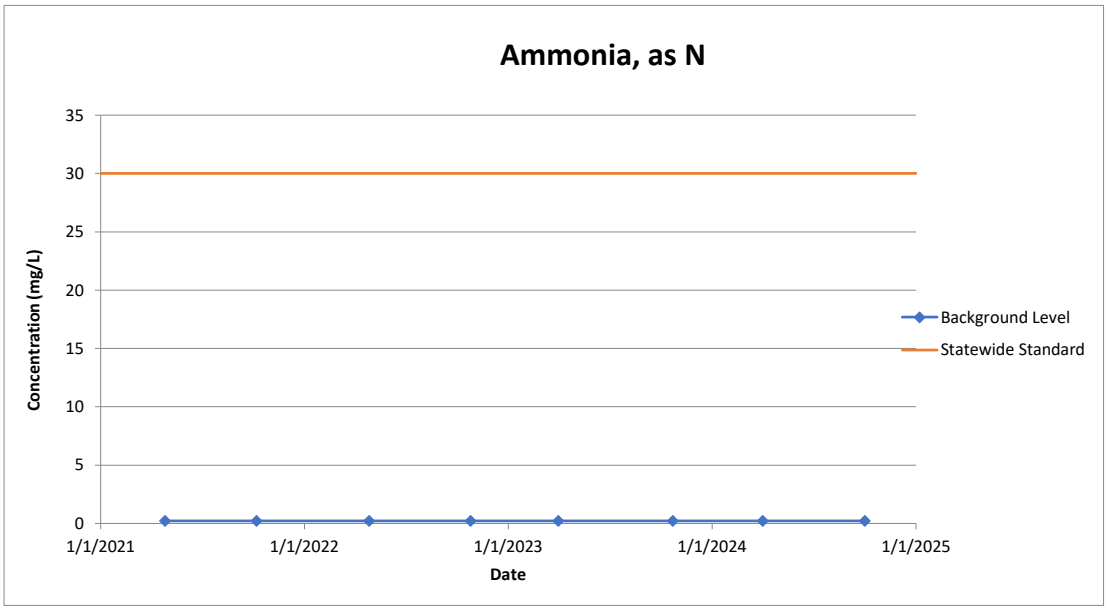
Monument #	Condition	Comments
1001 (SE)	Adequate ☑ Requires Maintenance ☐	
1002 (SW)	Adequate ☑ Requires Maintenance ☐	

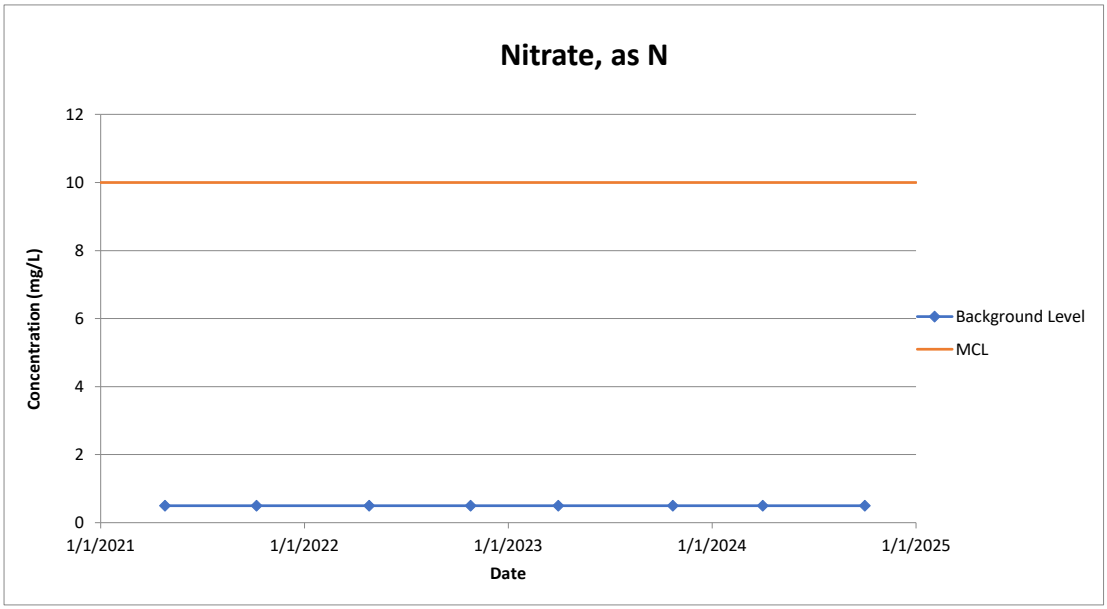
Appendix C: Background Levels

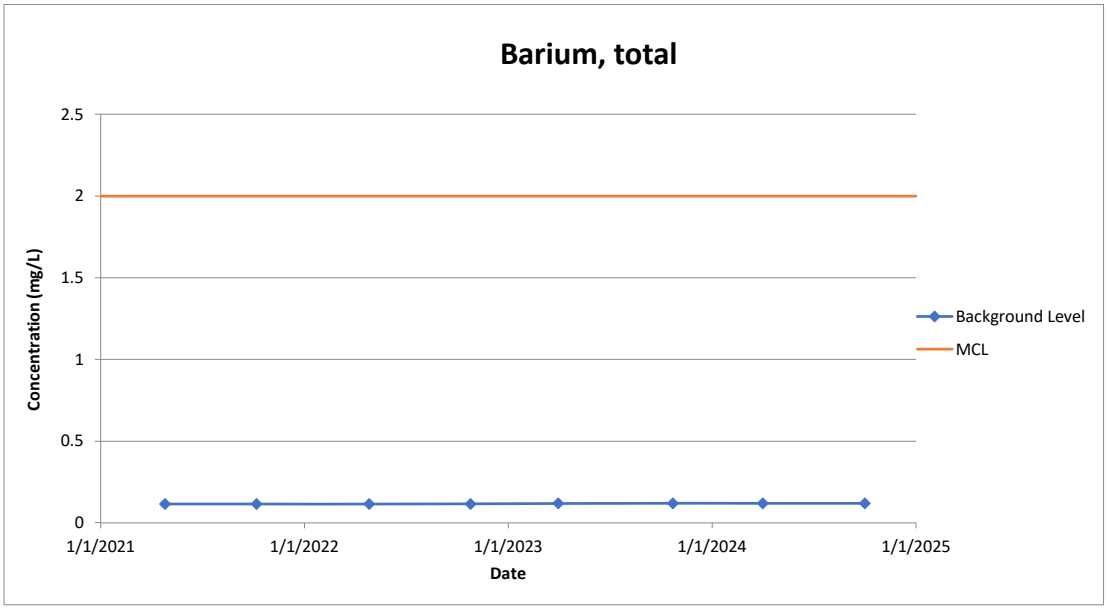

Chloride
8.1
8.05
8
7.95
7.9
7.85
7.8
7.75
7.7
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level

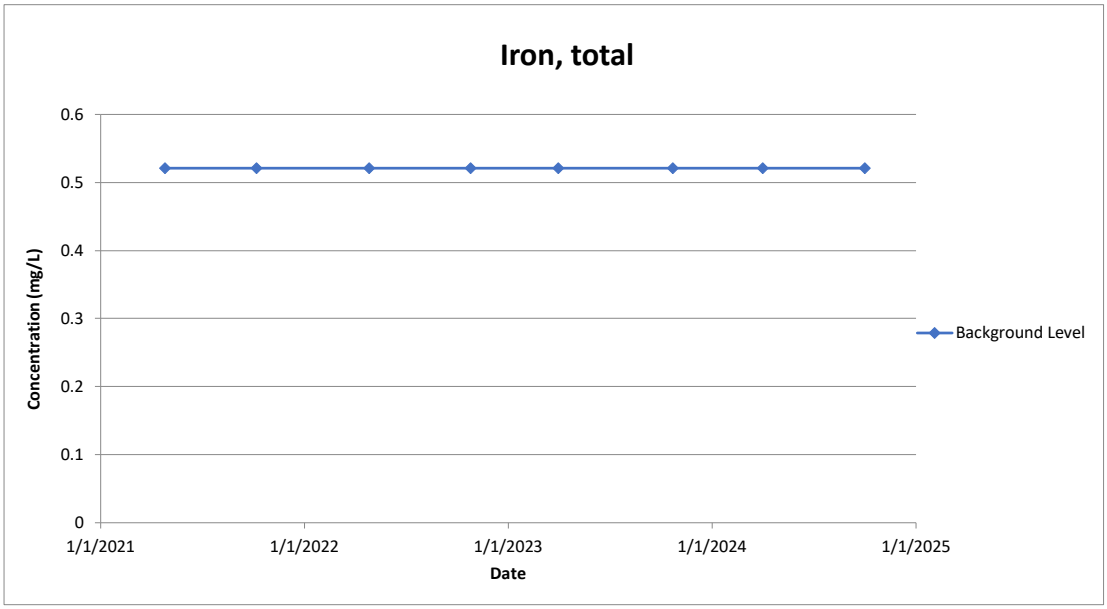

Fluoride
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level
MCL

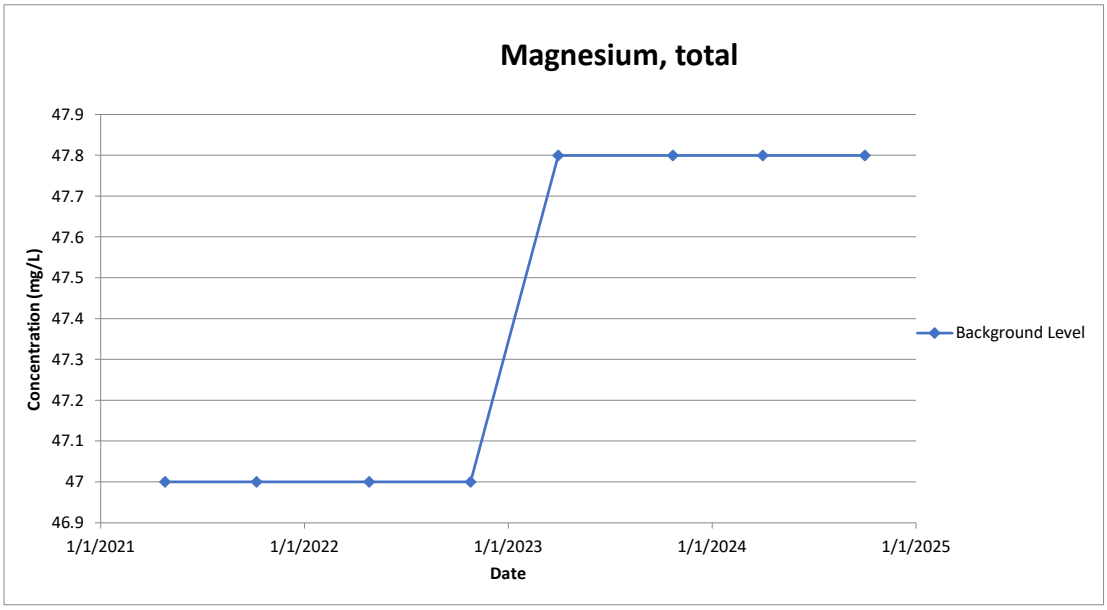

COD
16
14
12
10
8
6
4
2
0
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level

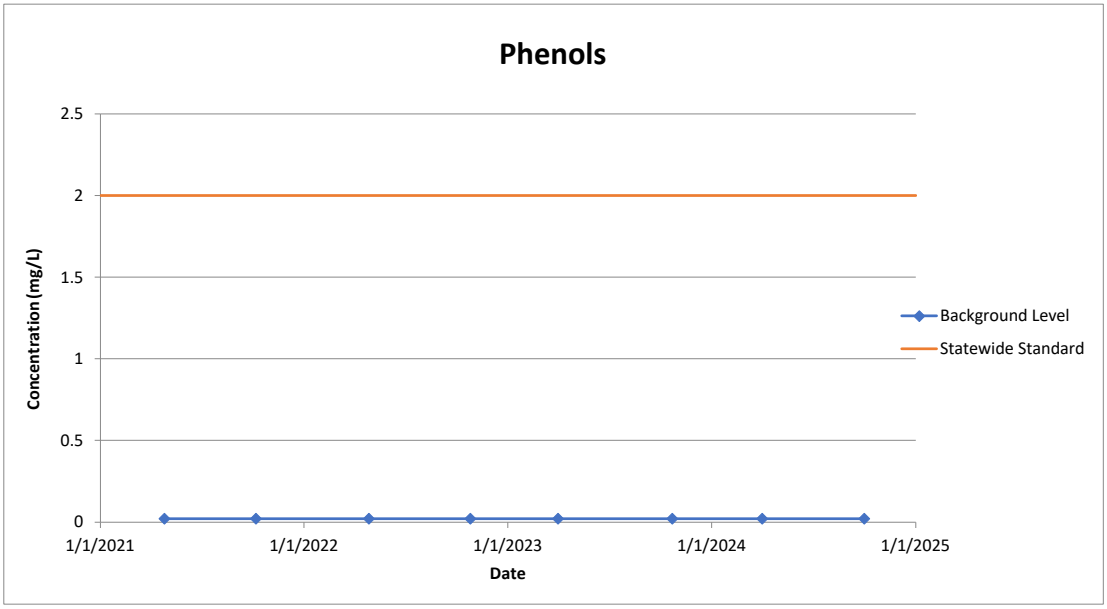

Ammonia, as N
Concentration (mg/L)
35
30
25
20
15
10
5
0
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level
Statewide Standard

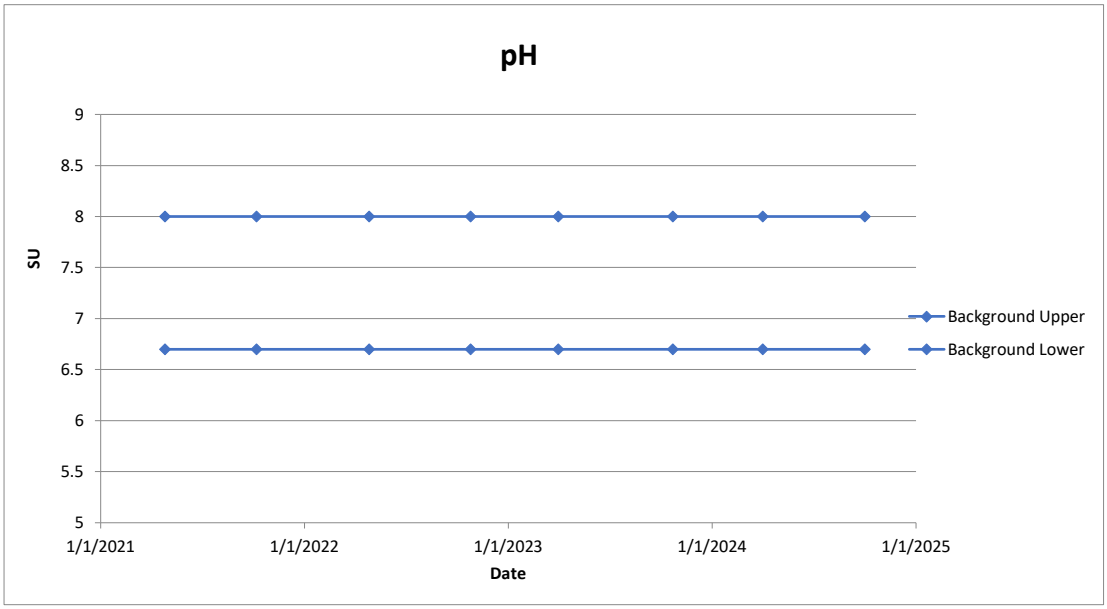

Nitrate, as N
Concentration (mg/L)
12
10
8
6
4
2
0
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level
MCL

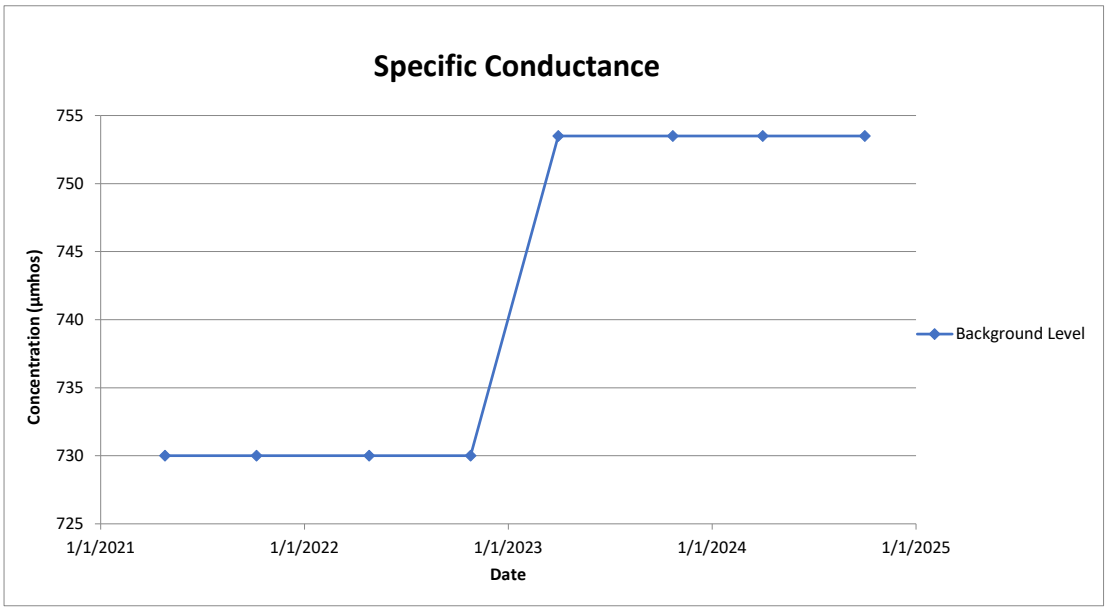

Barium, total
Concentration (mg/L)
2.5
2
1.5
1
0.5
0
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level
MCL


Iron, total
0.6
0.5
0.4
0.3
0.2
0.1
0
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level


Magnesium, total
47.9
47.8
47.7
47.6
47.5
47.4
47.3
47.2
47.1
47
46.9
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level


Phenols
2.5
2
1.5
1
0.5
0
Concentration (mg/L)
1/1/2021
1/1/2022
1/1/2023
1/1/2024
1/1/2025
Date
Background Level
Statewide Standard





Updated by: L. Auner, 12/30/2024
Checked by: M. Holicky 1/10/2025

Appendix D: Laboratory Reports

- April 2024
- October 2024

Laboratory Analytical Report
April 2024

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Daniel Mai
John Deere & Co
18600 S John Deere Road
PO BOX 538
Dubuque, Iowa 52001

Generated 7/1/2024 4:20:39 PM Revision 1

JOB DESCRIPTION

John Deere Dubuque Landfill

JOB NUMBER

310-278836-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Revision 1

Authorized for release by
Conner Calhoun, Project Management Assistant I
Conner.Calhoun@et.eurofinsus.com
(319)277-2401

Table of Contents

Job Narrative
310-278836-1

REVISION

The report being provided is a revision of the original report sent on 4/24/2024. The report (revision 1) is being revised due to Chloride and Fluoride results switched on MW-3.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/12/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.9°C and 5.6°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 6010D: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: S1 Leachate Open (310-278836-7). The sample(s) was preserved to the appropriate pH in the laboratory.

Method 6010D: The continuing calibration verification (CCV) associated with batch 310-419098 recovered above the upper control limit for Iron. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-278836-2 — Eurofins Cedar Falls

Job Narrative
310-278836-2

REVISION

The report being provided is a revision of the original report sent on 4/24/2024. The report (revision 1) is being revised due to Reporting the no dilution Nitrate run.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/12/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.9°C and 5.6°C.

HPLC/IC
Method 9056A_ORGFM_48H: The following sample was diluted due to the nature of the sample matrix: MW-3 (310-278836-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-278909-1 — Eurofins Cedar Falls

Job Narrative
310-278909-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/13/2024 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.9°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-278909-2 — Eurofins Cedar Falls

Job Narrative
310-278909-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/13/2024 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.9°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278836-1	MW-1	Water	04/11/24 12:20	04/12/24 09:30
310-278836-2	MW-2	Water	04/11/24 13:33	04/12/24 09:30
310-278836-3	MW-3	Water	04/11/24 10:37	04/12/24 09:30
310-278836-4	Dup-01	Water	04/11/24 00:00	04/12/24 09:30
310-278836-5	EB-01	Water	04/11/24 13:55	04/12/24 09:30
310-278836-6	S1 Underliner Open	Water	04/11/24 10:40	04/12/24 09:30
310-278836-7	S1 Leachate Open	Water	04/11/24 11:00	04/12/24 09:30
310-278836-8	S2 Leachate Open	Water	04/11/24 11:05	04/12/24 09:30
310-278836-9	Combined Leachate	Water	04/11/24 11:10	04/12/24 09:30
310-278909-1	S1 Underliner Closed	Water	04/12/24 11:30	04/13/24 09:00
310-278909-2	S2 Underliner Closed	Water	04/12/24 11:24	04/13/24 09:00

Detection Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-1 — Lab Sample ID: 310-278836-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.68		1.00		mg/L	1		9056A	Total/NA
Sulfate	25.7		1.00		mg/L	1		9056A	Total/NA
Barium	0.0770		0.0100		mg/L	1		6010D	Total/NA
Calcium	67.2		1.00		mg/L	1		6010D	Total/NA
Magnesium	38.5		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	360		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2 — Lab Sample ID: 310-278836-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	8.30		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	1.39		1.00		mg/L	5		9056A	Total/NA
Sulfate	20.9		1.00		mg/L	1		9056A	Total/NA
Barium	0.0825		0.0100		mg/L	1		6010D	Total/NA
Calcium	97.6		1.00		mg/L	1		6010D	Total/NA
Magnesium	41.6		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	418		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 310-278836-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	80.9		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	0.638		0.200		mg/L	1		9056A	Total/NA
Sulfate	126		5.00		mg/L	5		9056A	Total/NA
Barium	0.0455		0.0100		mg/L	1		6010D	Total/NA
Boron	2.26		0.200		mg/L	1		6010D	Total/NA
Calcium	122		1.00		mg/L	1		6010D	Total/NA
Magnesium	55.6		1.00		mg/L	1		6010D	Total/NA
Chemical Oxygen Demand	5.56		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	734		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: Dup-01 — Lab Sample ID: 310-278836-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	8.26		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	1.41		1.00		mg/L	5		9056A	Total/NA
Sulfate	19.1		1.00		mg/L	1		9056A	Total/NA
Barium	0.0780		0.0100		mg/L	1		6010D	Total/NA
Calcium	92.7		1.00		mg/L	1		6010D	Total/NA
Magnesium	39.5		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	398		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB-01 — Lab Sample ID: 310-278836-5

No Detections.

Client Sample ID: S1 Underliner Open — Lab Sample ID: 310-278836-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	80.9		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	2.97		1.00		mg/L	5		9056A	Total/NA
Fluoride	0.311		0.200		mg/L	1		9056A	Total/NA
Sulfate	26.7		1.00		mg/L	1		9056A	Total/NA
Barium	0.696		0.0100		mg/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Detection Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Underliner Open (Continued) — Lab Sample ID: 310-278836-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3.01		0.200		mg/L	1		6010D	Total/NA
Calcium	86.8		1.00		mg/L	1		6010D	Total/NA
Lithium	0.0679		0.0500		mg/L	1		6010D	Total/NA
Magnesium	42.6		1.00		mg/L	1		6010D	Total/NA
Chemical Oxygen Demand	17.7		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	706		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S1 Leachate Open — Lab Sample ID: 310-278836-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	115		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.443		0.200		mg/L	1		9056A	Total/NA
Sulfate	2.53		1.00		mg/L	1		9056A	Total/NA
Barium	0.869		0.0100		mg/L	1		6010D	Total/NA
Boron	8.19		0.200		mg/L	1		6010D	Total/NA
Calcium	115		1.00		mg/L	1		6010D	Total/NA
Iron	8.66		0.500		mg/L	1		6010D	Total/NA
Lithium	0.210		0.0500		mg/L	1		6010D	Total/NA
Magnesium	44.8		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	4.98		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	27.4		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	952		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S2 Leachate Open — Lab Sample ID: 310-278836-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	134		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.829		0.200		mg/L	1		9056A	Total/NA
Sulfate	1190		20.0		mg/L	20		9056A	Total/NA
Barium	0.0268		0.0100		mg/L	1		6010D	Total/NA
Boron	22.1		0.200		mg/L	1		6010D	Total/NA
Calcium	159		1.00		mg/L	1		6010D	Total/NA
Iron	2.88		0.500		mg/L	1		6010D	Total/NA
Lithium	1.14		0.0500		mg/L	1		6010D	Total/NA
Magnesium	126		1.00		mg/L	1		6010D	Total/NA
Molybdenum	0.0565		0.0500		mg/L	1		6010D	Total/NA
Ammonia as N	9.79		2.50		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	68.9		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	2510		250		mg/L	1		SM 2540C	Total/NA

Client Sample ID: Combined Leachate — Lab Sample ID: 310-278836-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	119		5.00		mg/L	5		9056A	Total/NA
Nitrate as N	0.865		0.200		mg/L	1		9056A	Total/NA
Fluoride	0.677		0.200		mg/L	1		9056A	Total/NA
Sulfate	715		20.0		mg/L	20		9056A	Total/NA
Barium	0.211		0.0100		mg/L	1		6010D	Total/NA
Boron	15.2		0.200		mg/L	1		6010D	Total/NA
Calcium	134		1.00		mg/L	1		6010D	Total/NA
Iron	2.17		0.500		mg/L	1		6010D	Total/NA
Lithium	0.695		0.0500		mg/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Combined Leachate (Continued) — Lab Sample ID: 310-278836-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	88.3		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	5.94		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	45.0		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	2010		250		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S1 Underliner Closed — Lab Sample ID: 310-278909-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	85.7		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	1.77		0.200		mg/L	1		9056A	Total/NA
Fluoride	0.302		0.200		mg/L	1		9056A	Total/NA
Sulfate	42.8		1.00		mg/L	1		9056A	Total/NA
Barium	0.496		0.0100		mg/L	1		6010D	Total/NA
Boron	3.87		0.200		mg/L	1		6010D	Total/NA
Calcium	71.1		1.00		mg/L	1		6010D	Total/NA
Lithium	0.0970		0.0500		mg/L	1		6010D	Total/NA
Magnesium	41.4		1.00		mg/L	1		6010D	Total/NA
Chemical Oxygen Demand	28.3		25.0		mg/L	5		5220D LL	Total/NA
Total Dissolved Solids	700		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S2 Underliner Closed — Lab Sample ID: 310-278909-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	132		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.701		0.200		mg/L	1		9056A	Total/NA
Sulfate	1170		50.0		mg/L	50		9056A	Total/NA
Barium	0.0321		0.0100		mg/L	1		6010D	Total/NA
Boron	22.1		0.200		mg/L	1		6010D	Total/NA
Calcium	166		1.00		mg/L	1		6010D	Total/NA
Iron	2.58		0.500		mg/L	1		6010D	Total/NA
Lithium	1.13		0.0500		mg/L	1		6010D	Total/NA
Magnesium	126		1.00		mg/L	1		6010D	Total/NA
Molybdenum	0.0522		0.0500		mg/L	1		6010D	Total/NA
Ammonia as N	8.63		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	74.9		25.0		mg/L	5		5220D LL	Total/NA
Total Dissolved Solids	2160		250		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-1

Date Collected: 04/11/24 12:20
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**5.68**		1.00		mg/L			04/12/24 15:38	1
Nitrate as N	<0.200		0.200		mg/L			04/12/24 15:38	1
Fluoride	<0.200		0.200		mg/L			04/12/24 15:38	1
Sulfate	**25.7**		1.00		mg/L			04/12/24 15:38	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0770**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:07	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:07	1
Calcium	**67.2**		1.00		mg/L		04/17/24 09:00	04/17/24 18:07	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:07	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:07	1
Magnesium	**38.5**		1.00		mg/L		04/17/24 09:00	04/17/24 18:07	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200	F1	0.200		mg/L			04/16/24 17:40	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**360**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-2

Date Collected: 04/11/24 13:33
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**8.30**		1.00		mg/L			04/12/24 15:51	1
Nitrate as N	**1.39**		1.00		mg/L			04/12/24 19:25	5
Fluoride	<0.200		0.200		mg/L			04/12/24 15:51	1
Sulfate	**20.9**		1.00		mg/L			04/12/24 15:51	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0825**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:09	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:09	1
Calcium	**97.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:09	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:09	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:09	1
Magnesium	**41.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:09	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			04/16/24 17:42	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**418**		50.0		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-3

Date Collected: 04/11/24 10:37
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**80.9**		1.00		mg/L			04/12/24 13:07	1
Nitrate as N	**0.638**		0.200		mg/L			04/12/24 13:07	1
Fluoride	<0.200		0.200		mg/L			04/12/24 13:07	1
Sulfate	**126**		5.00		mg/L			04/12/24 13:20	5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0455**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:11	1
Boron	**2.26**		0.200		mg/L		04/17/24 09:00	04/17/24 18:11	1
Calcium	**122**		1.00		mg/L		04/17/24 09:00	04/17/24 18:11	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:11	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:11	1
Magnesium	**55.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:11	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			04/16/24 17:43	1
Chemical Oxygen Demand (SM 5220D LL)	**5.56**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**734**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Dup-01

Date Collected: 04/11/24 00:00
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**8.26**		1.00		mg/L			04/12/24 12:42	1
Nitrate as N	**1.41**		1.00		mg/L			04/12/24 12:55	5
Fluoride	<0.200		0.200		mg/L			04/12/24 12:42	1
Sulfate	**19.1**		1.00		mg/L			04/12/24 12:42	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0780**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:13	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:13	1
Calcium	**92.7**		1.00		mg/L		04/17/24 09:00	04/17/24 18:13	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:13	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:13	1
Magnesium	**39.5**		1.00		mg/L		04/17/24 09:00	04/17/24 18:13	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			04/16/24 17:43	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**398**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: EB-01

Date Collected: 04/11/24 13:55
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/12/24 16:03	1
Nitrate as N	<0.200		0.200		mg/L			04/12/24 16:03	1
Fluoride	<0.200		0.200		mg/L			04/12/24 16:03	1
Sulfate	<1.00		1.00		mg/L			04/12/24 16:03	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		04/17/24 09:00	04/17/24 18:15	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:15	1
Calcium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 18:15	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:15	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:15	1
Magnesium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 18:15	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			04/16/24 17:45	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Underliner Open

Lab Sample ID: 310-278836-6

Date Collected: 04/11/24 10:40
Date Received: 04/12/24 09:30

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**80.9**		1.00		mg/L			04/12/24 13:33	1
Nitrate as N	**2.97**		1.00		mg/L			04/12/24 14:10	5
Fluoride	**0.311**		0.200		mg/L			04/12/24 13:33	1
Sulfate	**26.7**		1.00		mg/L			04/12/24 13:33	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.696**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:17	1
Boron	**3.01**		0.200		mg/L		04/17/24 09:00	04/17/24 18:17	1
Calcium	**86.8**		1.00		mg/L		04/17/24 09:00	04/17/24 18:17	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:17	1
Lithium	**0.0679**		0.0500		mg/L		04/17/24 09:00	04/17/24 18:17	1
Magnesium	**42.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:17	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		04/18/24 08:35	04/19/24 09:15	1
Chemical Oxygen Demand (SM 5220D LL)	**17.7**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**706**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Leachate Open

Date Collected: 04/11/24 11:00
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**115**		5.00		mg/L			04/12/24 14:35	5
Nitrate as N	<0.200		0.200		mg/L			04/12/24 14:23	1
Fluoride	**0.443**		0.200		mg/L			04/12/24 14:23	1
Sulfate	**2.53**		1.00		mg/L			04/12/24 14:23	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.869**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:21	1
Boron	**8.19**		0.200		mg/L		04/17/24 09:00	04/17/24 18:21	1
Calcium	**115**		1.00		mg/L		04/17/24 09:00	04/17/24 18:21	1
Iron	**8.66**		0.500		mg/L		04/17/24 09:00	04/19/24 10:59	1
Lithium	**0.210**		0.0500		mg/L		04/17/24 09:00	04/17/24 18:21	1
Magnesium	**44.8**		1.00		mg/L		04/17/24 09:00	04/17/24 18:21	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**4.98**		0.500		mg/L		04/18/24 08:35	04/19/24 09:17	1
Chemical Oxygen Demand (SM 5220D LL)	**27.4**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**952**		50.0		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Leachate Open

Date Collected: 04/11/24 11:05
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-8
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	134		5.00		mg/L			04/12/24 15:00	5
Nitrate as N	<0.200		0.200		mg/L			04/12/24 14:48	1
Fluoride	0.829		0.200		mg/L			04/12/24 14:48	1
Sulfate	1190		20.0		mg/L			04/13/24 13:15	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0268		0.0100		mg/L		04/17/24 09:00	04/17/24 18:27	1
Boron	22.1		0.200		mg/L		04/17/24 09:00	04/17/24 18:27	1
Calcium	159		1.00		mg/L		04/17/24 09:00	04/17/24 18:27	1
Iron	2.88		0.500		mg/L		04/17/24 09:00	04/19/24 11:01	1
Lithium	1.14		0.0500		mg/L		04/17/24 09:00	04/17/24 18:27	1
Magnesium	126		1.00		mg/L		04/17/24 09:00	04/17/24 18:27	1
Molybdenum	0.0565		0.0500		mg/L		04/17/24 09:00	04/17/24 18:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	9.79		2.50		mg/L		04/18/24 08:35	04/19/24 09:17	1
Chemical Oxygen Demand (SM 5220D LL)	68.9		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	2510		250		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Combined Leachate

Lab Sample ID: 310-278836-9

Date Collected: 04/11/24 11:10

Matrix: Water

Date Received: 04/12/24 09:30

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	119		5.00		mg/L			04/12/24 15:26	5
Nitrate as N	0.865		0.200		mg/L			04/12/24 15:13	1
Fluoride	0.677		0.200		mg/L			04/12/24 15:13	1
Sulfate	715		20.0		mg/L			04/13/24 13:28	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.211		0.0100		mg/L		04/17/24 09:00	04/17/24 18:29	1
Boron	15.2		0.200		mg/L		04/17/24 09:00	04/17/24 18:29	1
Calcium	134		1.00		mg/L		04/17/24 09:00	04/17/24 18:29	1
Iron	2.17		0.500		mg/L		04/17/24 09:00	04/19/24 11:03	1
Lithium	0.695		0.0500		mg/L		04/17/24 09:00	04/17/24 18:29	1
Magnesium	88.3		1.00		mg/L		04/17/24 09:00	04/17/24 18:29	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	5.94		0.500		mg/L		04/23/24 11:30	04/23/24 22:23	1
Chemical Oxygen Demand (SM 5220D LL)	45.0		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	2010		250		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Underliner Closed

Date Collected: 04/12/24 11:30
Date Received: 04/13/24 09:00

Lab Sample ID: 310-278909-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**85.7**		1.00		mg/L			04/13/24 13:40	1
Nitrate as N	**1.77**		0.200		mg/L			04/13/24 13:40	1
Fluoride	**0.302**		0.200		mg/L			04/13/24 13:40	1
Sulfate	**42.8**		1.00		mg/L			04/13/24 13:40	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.496**		0.0100		mg/L		04/15/24 15:46	04/17/24 10:46	1
Boron	**3.87**		0.200		mg/L		04/15/24 15:46	04/17/24 10:46	1
Calcium	**71.1**		1.00		mg/L		04/15/24 15:46	04/17/24 10:46	1
Iron	<0.500		0.500		mg/L		04/15/24 15:46	04/17/24 10:46	1
Lithium	**0.0970**		0.0500		mg/L		04/15/24 15:46	04/17/24 10:46	1
Magnesium	**41.4**		1.00		mg/L		04/15/24 15:46	04/17/24 10:46	1
Molybdenum	<0.0500		0.0500		mg/L		04/15/24 15:46	04/17/24 10:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		04/23/24 08:34	04/23/24 20:42	1
Chemical Oxygen Demand (SM 5220D LL)	**28.3**		25.0		mg/L			04/23/24 09:39	5
Total Dissolved Solids (SM 2540C)	**700**		50.0		mg/L			04/16/24 17:30	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Underliner Closed

Date Collected: 04/12/24 11:24
Date Received: 04/13/24 09:00

Lab Sample ID: 310-278909-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	132		5.00		mg/L			04/13/24 14:09	5
Nitrate as N	<0.200		0.200		mg/L			04/13/24 13:53	1
Fluoride	0.701		0.200		mg/L			04/13/24 13:53	1
Sulfate	1170		50.0		mg/L			04/17/24 10:26	50

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0321		0.0100		mg/L		04/15/24 15:47	04/17/24 10:48	1
Boron	22.1		0.200		mg/L		04/15/24 15:47	04/17/24 10:48	1
Calcium	166		1.00		mg/L		04/15/24 15:47	04/17/24 10:48	1
Iron	2.58		0.500		mg/L		04/15/24 15:47	04/17/24 10:48	1
Lithium	1.13		0.0500		mg/L		04/15/24 15:47	04/17/24 10:48	1
Magnesium	126		1.00		mg/L		04/15/24 15:47	04/17/24 10:48	1
Molybdenum	0.0522		0.0500		mg/L		04/15/24 15:47	04/17/24 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.63		0.500		mg/L		04/23/24 08:34	04/23/24 20:44	1
Chemical Oxygen Demand (SM 5220D LL)	74.9		25.0		mg/L			04/23/24 09:39	5
Total Dissolved Solids (SM 2540C)	2160		250		mg/L			04/16/24 17:30	1

Definitions/Glossary

Client: John Deere & Co
Job ID: 310-278836-1
Project/Site: John Deere Dubuque Landfill

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-418738/3
Matrix: Water
Analysis Batch: 418738

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/12/24 12:17	1
Nitrate as N	<0.200		0.200		mg/L			04/12/24 12:17	1
Fluoride	<0.200		0.200		mg/L			04/12/24 12:17	1
Sulfate	<1.00		1.00		mg/L			04/12/24 12:17	1

Lab Sample ID: LCS 310-418738/4
Matrix: Water
Analysis Batch: 418738

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.05		mg/L		101	90 - 110
Nitrate as N	2.00	2.125		mg/L		106	90 - 110
Fluoride	2.00	2.095		mg/L		105	90 - 110
Sulfate	10.0	11.03		mg/L		110	90 - 110

Lab Sample ID: 310-278836-5 MS
Matrix: Water
Analysis Batch: 418738

Client Sample ID: EB-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	<1.00		5.00	4.904		mg/L		98	80 - 120
Nitrate as N	<0.200		1.00	1.029		mg/L		103	80 - 120
Fluoride	<0.200		1.00	1.003		mg/L		100	80 - 120
Sulfate	<1.00		5.00	5.248		mg/L		105	80 - 120

Lab Sample ID: 310-278836-5 MSD
Matrix: Water
Analysis Batch: 418738

Client Sample ID: EB-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	<1.00		5.00	4.987		mg/L		100	80 - 120	2	15
Nitrate as N	<0.200		1.00	1.044		mg/L		104	80 - 120	1	15
Fluoride	<0.200		1.00	1.022		mg/L		102	80 - 120	2	15
Sulfate	<1.00		5.00	5.368		mg/L		107	80 - 120	2	15

Lab Sample ID: MB 310-419158/3
Matrix: Water
Analysis Batch: 419158

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/17/24 09:29	1
Fluoride	<0.200		0.200		mg/L			04/17/24 09:29	1
Sulfate	<1.00		1.00		mg/L			04/17/24 09:29	1

Lab Sample ID: LCS 310-419158/4
Matrix: Water
Analysis Batch: 419158

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.04		mg/L		100	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 310-419158/4
Matrix: Water
Analysis Batch: 419158

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	2.149		mg/L		107	90 - 110
Sulfate	10.0	10.47		mg/L		105	90 - 110

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 310-418777/1-A
Matrix: Water
Analysis Batch: 419007

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418777

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		04/15/24 15:46	04/17/24 09:52	1
Boron	<0.200		0.200		mg/L		04/15/24 15:46	04/17/24 09:52	1
Calcium	<1.00		1.00		mg/L		04/15/24 15:46	04/17/24 09:52	1
Iron	<0.500		0.500		mg/L		04/15/24 15:46	04/17/24 09:52	1
Lithium	<0.0500		0.0500		mg/L		04/15/24 15:46	04/17/24 09:52	1
Magnesium	<1.00		1.00		mg/L		04/15/24 15:46	04/17/24 09:52	1
Molybdenum	<0.0500		0.0500		mg/L		04/15/24 15:46	04/17/24 09:52	1

Lab Sample ID: LCS 310-418777/2-A
Matrix: Water
Analysis Batch: 419007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	1.00	1.003		mg/L		100	80 - 120
Boron	2.00	1.926		mg/L		96	80 - 120
Calcium	20.0	18.93		mg/L		95	80 - 120
Iron	2.00	2.009		mg/L		100	80 - 120
Lithium	2.00	1.994		mg/L		100	80 - 120
Magnesium	20.0	19.59		mg/L		98	80 - 120
Molybdenum	2.00	1.976		mg/L		99	80 - 120

Lab Sample ID: MB 310-418887/1-A
Matrix: Water
Analysis Batch: 419098

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		04/17/24 09:00	04/17/24 17:41	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 17:41	1
Calcium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 17:41	1
Iron	<0.500		0.500		mg/L		04/17/24 09:00	04/17/24 17:41	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 17:41	1
Magnesium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 17:41	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 17:41	1

Lab Sample ID: LCS 310-418887/2-A
Matrix: Water
Analysis Batch: 419098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	1.00	0.9780		mg/L		98	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 310-418887/2-A
Matrix: Water
Analysis Batch: 419098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2.00	1.898		mg/L		95	80 - 120
Calcium	20.0	18.76		mg/L		94	80 - 120
Iron	2.00	2.089		mg/L		104	80 - 120
Lithium	2.00	1.957		mg/L		98	80 - 120
Magnesium	20.0	19.17		mg/L		96	80 - 120
Molybdenum	2.00	1.962		mg/L		98	80 - 120

Lab Sample ID: 310-278836-6 DU
Matrix: Water
Analysis Batch: 419098

Client Sample ID: S1 Underliner Open
Prep Type: Total/NA
Prep Batch: 418887

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Barium	0.696		0.6877		mg/L		1	20
Boron	3.01		2.935		mg/L		3	20
Calcium	86.8		85.56		mg/L		1	20
Iron	<0.500	^+	<0.500	^+	mg/L		NC	20
Lithium	0.0679		0.06641		mg/L		2	20
Magnesium	42.6		41.92		mg/L		2	20
Molybdenum	<0.0500		<0.0500		mg/L		NC	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 310-418900/90
Matrix: Water
Analysis Batch: 418900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.200		0.200		mg/L			04/16/24 17:38	1

Lab Sample ID: LCS 310-418900/91
Matrix: Water
Analysis Batch: 418900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	8.55	8.540		mg/L		100	90 - 110

Lab Sample ID: 310-278836-1 MS
Matrix: Water
Analysis Batch: 418900

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	<0.200	F1	1.00	0.8415	F1	mg/L		84	90 - 110

Lab Sample ID: 310-278836-1 MSD
Matrix: Water
Analysis Batch: 418900

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia as N	<0.200	F1	1.00	0.8190	F1	mg/L		82	90 - 110	3	10

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: MB 310-419084/1-A
Matrix: Water
Analysis Batch: 419264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419084

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.500		0.500		mg/L		04/18/24 08:35	04/19/24 09:05	1

Lab Sample ID: LCS 310-419084/2-A
Matrix: Water
Analysis Batch: 419264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	4.00	4.107		mg/L		103	90 - 110

Lab Sample ID: MB 310-419538/1-A
Matrix: Water
Analysis Batch: 419635

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419538

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.500		0.500		mg/L		04/23/24 08:34	04/23/24 20:35	1

Lab Sample ID: LCS 310-419538/2-A
Matrix: Water
Analysis Batch: 419635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419538

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	4.00	3.933		mg/L		98	90 - 110

Lab Sample ID: MB 310-419579/1-A
Matrix: Water
Analysis Batch: 419635

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419579

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.500		0.500		mg/L		04/23/24 11:30	04/23/24 22:13	1

Lab Sample ID: LCS 310-419579/2-A
Matrix: Water
Analysis Batch: 419635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419579

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	4.00	4.164		mg/L		104	90 - 110

Method: 5220D LL - COD

Lab Sample ID: MB 310-419167/32
Matrix: Water
Analysis Batch: 419167

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			04/18/24 14:24	1

Method: 5220D LL - COD (Continued)

Lab Sample ID: LCS 310-419167/33
Matrix: Water
Analysis Batch: 419167

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	126.4		mg/L		101	85 - 115

Lab Sample ID: MB 310-419553/32
Matrix: Water
Analysis Batch: 419553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			04/23/24 09:39	1

Lab Sample ID: MB 310-419553/5
Matrix: Water
Analysis Batch: 419553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			04/23/24 09:39	1

Lab Sample ID: LCS 310-419553/3
Matrix: Water
Analysis Batch: 419553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	123.6		mg/L		99	85 - 115

Lab Sample ID: LCS 310-419553/33
Matrix: Water
Analysis Batch: 419553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	119.2		mg/L		95	85 - 115

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-418795/1
Matrix: Water
Analysis Batch: 418795

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			04/15/24 18:54	1

Lab Sample ID: LCS 310-418795/2
Matrix: Water
Analysis Batch: 418795

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	956.0		mg/L		96	90 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 310-418901/1
Matrix: Water
Analysis Batch: 418901

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			04/16/24 17:30	1

Lab Sample ID: LCS 310-418901/2
Matrix: Water
Analysis Batch: 418901

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	968.0		mg/L		97	90 - 110

HPLC/IC

Analysis Batch: 418738

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	9056A	
310-278836-2	MW-2	Total/NA	Water	9056A	
310-278836-2	MW-2	Total/NA	Water	9056A	
310-278836-3	MW-3	Total/NA	Water	9056A	
310-278836-3	MW-3	Total/NA	Water	9056A	
310-278836-4	Dup-01	Total/NA	Water	9056A	
310-278836-4	Dup-01	Total/NA	Water	9056A	
310-278836-5	EB-01	Total/NA	Water	9056A	
310-278836-6	S1 Underliner Open	Total/NA	Water	9056A	
310-278836-6	S1 Underliner Open	Total/NA	Water	9056A	
310-278836-7	S1 Leachate Open	Total/NA	Water	9056A	
310-278836-7	S1 Leachate Open	Total/NA	Water	9056A	
310-278836-8	S2 Leachate Open	Total/NA	Water	9056A	
310-278836-8	S2 Leachate Open	Total/NA	Water	9056A	
310-278836-8	S2 Leachate Open	Total/NA	Water	9056A	
310-278836-9	Combined Leachate	Total/NA	Water	9056A	
310-278836-9	Combined Leachate	Total/NA	Water	9056A	
310-278836-9	Combined Leachate	Total/NA	Water	9056A	
310-278909-1	S1 Underliner Closed	Total/NA	Water	9056A	
310-278909-2	S2 Underliner Closed	Total/NA	Water	9056A	
310-278909-2	S2 Underliner Closed	Total/NA	Water	9056A	
MB 310-418738/3	Method Blank	Total/NA	Water	9056A	
LCS 310-418738/4	Lab Control Sample	Total/NA	Water	9056A	
310-278836-5 MS	EB-01	Total/NA	Water	9056A	
310-278836-5 MSD	EB-01	Total/NA	Water	9056A	

Analysis Batch: 419158

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-2	S2 Underliner Closed	Total/NA	Water	9056A	
MB 310-419158/3	Method Blank	Total/NA	Water	9056A	
LCS 310-419158/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 418777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-1	S1 Underliner Closed	Total/NA	Water	3005A	
310-278909-2	S2 Underliner Closed	Total/NA	Water	3005A	
MB 310-418777/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418777/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 418887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	3005A	
310-278836-2	MW-2	Total/NA	Water	3005A	
310-278836-3	MW-3	Total/NA	Water	3005A	
310-278836-4	Dup-01	Total/NA	Water	3005A	
310-278836-5	EB-01	Total/NA	Water	3005A	
310-278836-6	S1 Underliner Open	Total/NA	Water	3005A	
310-278836-7	S1 Leachate Open	Total/NA	Water	3005A	
310-278836-8	S2 Leachate Open	Total/NA	Water	3005A	

Metals (Continued)

Prep Batch: 418887 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-9	Combined Leachate	Total/NA	Water	3005A	
MB 310-418887/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418887/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-278836-6 DU	S1 Underliner Open	Total/NA	Water	3005A	

Analysis Batch: 419007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-1	S1 Underliner Closed	Total/NA	Water	6010D	418777
310-278909-2	S2 Underliner Closed	Total/NA	Water	6010D	418777
MB 310-418777/1-A	Method Blank	Total/NA	Water	6010D	418777
LCS 310-418777/2-A	Lab Control Sample	Total/NA	Water	6010D	418777

Analysis Batch: 419098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	6010D	418887
310-278836-2	MW-2	Total/NA	Water	6010D	418887
310-278836-3	MW-3	Total/NA	Water	6010D	418887
310-278836-4	Dup-01	Total/NA	Water	6010D	418887
310-278836-5	EB-01	Total/NA	Water	6010D	418887
310-278836-6	S1 Underliner Open	Total/NA	Water	6010D	418887
310-278836-7	S1 Leachate Open	Total/NA	Water	6010D	418887
310-278836-8	S2 Leachate Open	Total/NA	Water	6010D	418887
310-278836-9	Combined Leachate	Total/NA	Water	6010D	418887
MB 310-418887/1-A	Method Blank	Total/NA	Water	6010D	418887
LCS 310-418887/2-A	Lab Control Sample	Total/NA	Water	6010D	418887
310-278836-6 DU	S1 Underliner Open	Total/NA	Water	6010D	418887

Analysis Batch: 419305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-7	S1 Leachate Open	Total/NA	Water	6010D	418887
310-278836-8	S2 Leachate Open	Total/NA	Water	6010D	418887
310-278836-9	Combined Leachate	Total/NA	Water	6010D	418887

General Chemistry

Analysis Batch: 418795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	SM 2540C	
310-278836-2	MW-2	Total/NA	Water	SM 2540C	
310-278836-3	MW-3	Total/NA	Water	SM 2540C	
310-278836-4	Dup-01	Total/NA	Water	SM 2540C	
310-278836-5	EB-01	Total/NA	Water	SM 2540C	
310-278836-6	S1 Underliner Open	Total/NA	Water	SM 2540C	
310-278836-7	S1 Leachate Open	Total/NA	Water	SM 2540C	
310-278836-8	S2 Leachate Open	Total/NA	Water	SM 2540C	
310-278836-9	Combined Leachate	Total/NA	Water	SM 2540C	
MB 310-418795/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-418795/2	Lab Control Sample	Total/NA	Water	SM 2540C	

QC Association Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

General Chemistry

Analysis Batch: 418900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	350.1	
310-278836-2	MW-2	Total/NA	Water	350.1	
310-278836-3	MW-3	Total/NA	Water	350.1	
310-278836-4	Dup-01	Total/NA	Water	350.1	
310-278836-5	EB-01	Total/NA	Water	350.1	
MB 310-418900/90	Method Blank	Total/NA	Water	350.1	
LCS 310-418900/91	Lab Control Sample	Total/NA	Water	350.1	
310-278836-1 MS	MW-1	Total/NA	Water	350.1	
310-278836-1 MSD	MW-1	Total/NA	Water	350.1	

Analysis Batch: 418901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-1	S1 Underliner Closed	Total/NA	Water	SM 2540C	
310-278909-2	S2 Underliner Closed	Total/NA	Water	SM 2540C	
MB 310-418901/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-418901/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Prep Batch: 419084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-6	S1 Underliner Open	Total/NA	Water	350.1	
310-278836-7	S1 Leachate Open	Total/NA	Water	350.1	
310-278836-8	S2 Leachate Open	Total/NA	Water	350.1	
MB 310-419084/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-419084/2-A	Lab Control Sample	Total/NA	Water	350.1	

Analysis Batch: 419167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-1	MW-1	Total/NA	Water	5220D LL	
310-278836-2	MW-2	Total/NA	Water	5220D LL	
310-278836-3	MW-3	Total/NA	Water	5220D LL	
310-278836-4	Dup-01	Total/NA	Water	5220D LL	
310-278836-5	EB-01	Total/NA	Water	5220D LL	
310-278836-6	S1 Underliner Open	Total/NA	Water	5220D LL	
310-278836-7	S1 Leachate Open	Total/NA	Water	5220D LL	
310-278836-8	S2 Leachate Open	Total/NA	Water	5220D LL	
310-278836-9	Combined Leachate	Total/NA	Water	5220D LL	
MB 310-419167/32	Method Blank	Total/NA	Water	5220D LL	
LCS 310-419167/33	Lab Control Sample	Total/NA	Water	5220D LL	

Analysis Batch: 419264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-6	S1 Underliner Open	Total/NA	Water	350.1	419084
310-278836-7	S1 Leachate Open	Total/NA	Water	350.1	419084
310-278836-8	S2 Leachate Open	Total/NA	Water	350.1	419084
MB 310-419084/1-A	Method Blank	Total/NA	Water	350.1	419084
LCS 310-419084/2-A	Lab Control Sample	Total/NA	Water	350.1	419084

Prep Batch: 419538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-1	S1 Underliner Closed	Total/NA	Water	350.1	
310-278909-2	S2 Underliner Closed	Total/NA	Water	350.1	

General Chemistry (Continued)

Prep Batch: 419538 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-419538/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-419538/2-A	Lab Control Sample	Total/NA	Water	350.1	

Analysis Batch: 419553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278909-1	S1 Underliner Closed	Total/NA	Water	5220D LL	
310-278909-2	S2 Underliner Closed	Total/NA	Water	5220D LL	
MB 310-419553/32	Method Blank	Total/NA	Water	5220D LL	
MB 310-419553/5	Method Blank	Total/NA	Water	5220D LL	
LCS 310-419553/3	Lab Control Sample	Total/NA	Water	5220D LL	
LCS 310-419553/33	Lab Control Sample	Total/NA	Water	5220D LL	

Prep Batch: 419579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-9	Combined Leachate	Total/NA	Water	350.1	
MB 310-419579/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-419579/2-A	Lab Control Sample	Total/NA	Water	350.1	

Analysis Batch: 419635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278836-9	Combined Leachate	Total/NA	Water	350.1	419579
310-278909-1	S1 Underliner Closed	Total/NA	Water	350.1	419538
310-278909-2	S2 Underliner Closed	Total/NA	Water	350.1	419538
MB 310-419538/1-A	Method Blank	Total/NA	Water	350.1	419538
MB 310-419579/1-A	Method Blank	Total/NA	Water	350.1	419579
LCS 310-419538/2-A	Lab Control Sample	Total/NA	Water	350.1	419538
LCS 310-419579/2-A	Lab Control Sample	Total/NA	Water	350.1	419579

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-1

Lab Sample ID: 310-278836-1

Date Collected: 04/11/24 12:20

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 15:38
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:07
Total/NA	Analysis	350.1		1	418900	ZJX4	EET CF	04/16/24 17:40
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: MW-2

Lab Sample ID: 310-278836-2

Date Collected: 04/11/24 13:33

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 15:51
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 19:25
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:09
Total/NA	Analysis	350.1		1	418900	ZJX4	EET CF	04/16/24 17:42
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: MW-3

Lab Sample ID: 310-278836-3

Date Collected: 04/11/24 10:37

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 13:07
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 13:20
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:11
Total/NA	Analysis	350.1		1	418900	ZJX4	EET CF	04/16/24 17:43
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: Dup-01

Lab Sample ID: 310-278836-4

Date Collected: 04/11/24 00:00

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 12:42
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 12:55
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:13
Total/NA	Analysis	350.1		1	418900	ZJX4	EET CF	04/16/24 17:43

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Dup-01

Lab Sample ID: 310-278836-4

Date Collected: 04/11/24 00:00

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: EB-01

Lab Sample ID: 310-278836-5

Date Collected: 04/11/24 13:55

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 16:03
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:15
Total/NA	Analysis	350.1		1	418900	ZJX4	EET CF	04/16/24 17:45
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: S1 Underliner Open

Lab Sample ID: 310-278836-6

Date Collected: 04/11/24 10:40

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 13:33
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 14:10
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:17
Total/NA	Prep	350.1			419084	MQ8M	EET CF	04/18/24 08:35
Total/NA	Analysis	350.1		1	419264	ENB7	EET CF	04/19/24 09:15
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: S1 Leachate Open

Lab Sample ID: 310-278836-7

Date Collected: 04/11/24 11:00

Matrix: Water

Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 14:23
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 14:35
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:21
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419305	ZRI4	EET CF	04/19/24 10:59
Total/NA	Prep	350.1			419084	MQ8M	EET CF	04/18/24 08:35
Total/NA	Analysis	350.1		1	419264	ENB7	EET CF	04/19/24 09:17
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Leachate Open

Lab Sample ID: 310-278836-8
Matrix: Water
Date Collected: 04/11/24 11:05
Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 14:48
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 15:00
Total/NA	Analysis	9056A		20	418738	QTZ5	EET CF	04/13/24 13:15
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:27
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419305	ZRI4	EET CF	04/19/24 11:01
Total/NA	Prep	350.1			419084	MQ8M	EET CF	04/18/24 08:35
Total/NA	Analysis	350.1		1	419264	ENB7	EET CF	04/19/24 09:17
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: Combined Leachate

Lab Sample ID: 310-278836-9
Matrix: Water
Date Collected: 04/11/24 11:10
Date Received: 04/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/12/24 15:13
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/12/24 15:26
Total/NA	Analysis	9056A		20	418738	QTZ5	EET CF	04/13/24 13:28
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419098	ZRI4	EET CF	04/17/24 18:29
Total/NA	Prep	3005A			418887	KM3E	EET CF	04/17/24 09:00
Total/NA	Analysis	6010D		1	419305	ZRI4	EET CF	04/19/24 11:03
Total/NA	Prep	350.1			419579	MQ8M	EET CF	04/23/24 11:30
Total/NA	Analysis	350.1		1	419635	ZJX4	EET CF	04/23/24 22:23
Total/NA	Analysis	5220D LL		1	419167	D7CP	EET CF	04/18/24 14:24
Total/NA	Analysis	SM 2540C		1	418795	D7CP	EET CF	04/15/24 18:54

Client Sample ID: S1 Underliner Closed

Lab Sample ID: 310-278909-1
Matrix: Water
Date Collected: 04/12/24 11:30
Date Received: 04/13/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/13/24 13:40
Total/NA	Prep	3005A			418777	QTZ5	EET CF	04/15/24 15:46
Total/NA	Analysis	6010D		1	419007	ZRI4	EET CF	04/17/24 10:46
Total/NA	Prep	350.1			419538	MQ8M	EET CF	04/23/24 08:34
Total/NA	Analysis	350.1		1	419635	ZJX4	EET CF	04/23/24 20:42
Total/NA	Analysis	5220D LL		5	419553	ENB7	EET CF	04/23/24 09:39
Total/NA	Analysis	SM 2540C		1	418901	D7CP	EET CF	04/16/24 17:30

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Underliner Closed

Date Collected: 04/12/24 11:24
Date Received: 04/13/24 09:00

Lab Sample ID: 310-278909-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		50	419158	QTZ5	EET CF	04/17/24 10:26
Total/NA	Analysis	9056A		1	418738	QTZ5	EET CF	04/13/24 13:53
Total/NA	Analysis	9056A		5	418738	QTZ5	EET CF	04/13/24 14:09
Total/NA	Prep	3005A			418777	QTZ5	EET CF	04/15/24 15:47
Total/NA	Analysis	6010D		1	419007	ZRI4	EET CF	04/17/24 10:48
Total/NA	Prep	350.1			419538	MQ8M	EET CF	04/23/24 08:34
Total/NA	Analysis	350.1		1	419635	ZJX4	EET CF	04/23/24 20:44
Total/NA	Analysis	5220D LL		5	419553	ENB7	EET CF	04/23/24 09:39
Total/NA	Analysis	SM 2540C		1	418901	D7CP	EET CF	04/16/24 17:30

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: John Deere & Co
Job ID: 310-278836-1
Project/Site: John Deere Dubuque Landfill

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	05-27-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
350.1		Water	Ammonia as N
350.1	350.1	Water	Ammonia as N
SM 2540C		Water	Total Dissolved Solids

Method Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
350.1	Nitrogen, Ammonia	EPA	EET CF
5220D LL	COD	SM	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
350.1	Distillation, Ammonia	EPA	EET CF

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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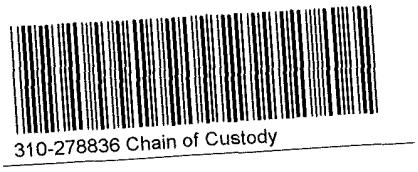

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC

City/State: CITY | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4-12-24 | TIME 930 | Received By: MU

Delivery Type: ☐ UPS ☑ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☑ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☑ Yes ☐ No *If yes:* Cooler # 1 of 2

Cooler Custody Seals Present? ☑ Yes ☐ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☑ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☑ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: X | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 5.6 | Corrected Temp (°C): 5.6

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding If no, proceed with login

Additional Comments

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC

City/State: CITY | STATE: WI | Project:

Receipt Information

Date/Time Received: DATE: 4-12-24 | TIME: 930 | Received By: MU

Delivery Type: ☐ UPS ☑ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:

Condition of Cooler/Containers

Sample(s) received in Cooler? ☑ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☑ Yes ☐ No *If yes:* Cooler # 2 of 2

Cooler Custody Seals Present? ☑ Yes ☐ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☑ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: ☐ NONE

Thermometer ID: X | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 4.9 | Corrected Temp (°C): 4.9

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

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Client Information	Sampler: Wesley Braga	Lab PM: Calhoun, Conner M	Carrier Tracking No(s):	COC No: 310-91979-20055.1
Client Contact: Wesley Braga	Phone: 608-234-7374	E-Mail: Conner.Calhoun@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: TRC Companies	PWSID:			Job #:
Address: 999 Fourier Drive, Ste 101	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53717	Compliance Project: Δ Yes Δ No			
Phone:	John Deere PO #: 4513542286			
Email: Wbraga@TRCcompanies.com	WO #:			
Project Name: John Deere Dubuque Landfill	Eurofins Project #: 31002706			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ammonia - 350.1	COD - 5220D_LL	9056A_ORGFM_28D - Chloride, Fluoride, and sulfate	9056_ORGFM_48H - Nitrate	6010C - Total Ba, B, Ca, Fe, Li, Mg, Mo	2540C_Calcd - Total Dissolved Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	S	N	N	D	N		
MW-1	4/11/24	1220	G	Water	N		X	X	X	X	X	X	4	Nitrate- 48hour hold time
MW-2	4/11/24	1333	G	Water	N		X	X	X	X	X	X	4	
MW-3	4/11/24	1037	G	Water	N		X	X	X	X	X	X	4	
DUP-01	4/11/24	-	G	Water	N		X	X	X	X	X	X	4	
EB-01	4/11/24	1355	G	Water	N		X	X	X	X	X	X	4	
S1 Underliner open	4/11/24	1040	G	Water	N		X	X	X	X	X	X	4	
S1 Leachate open	4/11/24	1100	G	Water	N		X	X	X	X	X	X	4	
S2 Leachate open	4/11/24	1105	G	Water	N		X	X	X	X	X	X	4	
Combined leachate	4/11/24	1100	G	Water	N		X	X	X	X	X	X	4	
				Water										
				Water										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	4/11/2024 1530	TRC	[signature]	4-12-24 930	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

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310-278909 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC

City/State: CITY | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4-13-24 | TIME 900 | Received By: MU

Delivery Type: ☐ UPS ☒ FedEx SAT ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # _____ of _____
Cooler Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: X | Correction Factor (°C): 0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.9 | Corrected Temp (°C): 0.9

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

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Client Information	Sampler: Wesley Braga	Lab PM: Calhoun, Conner M	Carrier Tracking No(s):	COC No: 310-91979-20055 1
Client Contact: Wesley Braga	Phone: 608-234-7374	E-Mail: Conner.Calhoun@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Companies	PWSID:			Job #:
Address: 999 Fourier Drive, Ste 101	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53717	Compliance Project: Δ Yes Δ No			
Phone: 608-234-7374	John Deere PO #: 4513542286			
Email: wbraga@trccompanies.com	WO #:			
Project Name: John Deere Dubuque Landfill	Eurofins Project #: 31002706			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ammonia- 350.1	COD- 5220D_LL	9056A_ORGFM_28D- Chloride, Fluoride, and sulfate	9056_ORGFM_48H- Nitrate	6010C - Total Ba, B, Ca, Fe, Li, Mg, Mo	2540C_Calcd - Total Dissolved Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	S	N	N	D	N		
S1 Underliner Closed	4/12/24	1130	G	Water	N		X	X	X	X	X	X	4	Nitrate- 48hour hold time
S2 Underliner Closed	4/12/24	1124	G	Water	N		X	X	X	X	X	X	4	
				Water										
				Water										
				Water										
				Water										
				Water										
				Water										
				Water										
				Water										
				Water										
				Water										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4/12/24 1545		ML	4-13-24 900	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

Login Sample Receipt Checklist

Client: John Deere & Co

Job Number: 310-278836-1

Login Number: 278836
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Analytical Report
October 2024

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Austin Shoemaker
John Deere & Co
18600 S John Deere Road
PO BOX 538
Dubuque, Iowa 52001

Generated 11/18/2024 4:49:27 PM Revision 1

JOB DESCRIPTION

John Deere Dubuque Landfill (TRC)

JOB NUMBER

310-293885-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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Authorization

Generated
11/18/2024 4:49:27 PM
Revision 1

Authorized for release by
Conner Calhoun, Client Service Manager
Conner.Calhoun@et.eurofinsus.com
(319)277-2401

Table of Contents

Job Narrative
310-293885-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/29/2024 8:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.9°C and 5.2°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 5220D_LL: The following samples were analyzed at a dilution due to the chloride pre-screening results: MW-3 (310-293885-7) and Dup-01 (310-293885-9). Elevated reporting limits are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-293885-2 — Eurofins Cedar Falls

Job Narrative
310-293885-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/29/2024 8:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.9°C and 5.2°C.

HPLC/IC
Method 9056A_ORGFM_48H: The following sample(s) was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: Dup-01 (310-293885-9).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-293962-1 — Eurofins Cedar Falls

Job Narrative
310-293962-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/30/2024 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.1°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-293962-2 — Eurofins Cedar Falls

Job Narrative
310-293962-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/30/2024 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.1°C.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-293885-1	S1 Leachate Open	Water	10/28/24 11:30	10/29/24 08:50
310-293885-2	S2 Leachate Open	Water	10/28/24 11:35	10/29/24 08:50
310-293885-3	S1 Underliner Open	Water	10/28/24 11:20	10/29/24 08:50
310-293885-4	Combined Leachate	Water	10/28/24 11:45	10/29/24 08:50
310-293885-5	MW-1	Water	10/28/24 14:57	10/29/24 08:50
310-293885-6	MW-2	Water	10/28/24 13:24	10/29/24 08:50
310-293885-7	MW-3	Water	10/28/24 11:33	10/29/24 08:50
310-293885-8	EB-01	Water	10/28/24 14:35	10/29/24 08:50
310-293885-9	Dup-01	Water	10/28/24 00:00	10/29/24 08:50
310-293962-1	S1 underliner Closed	Water	10/29/24 11:05	10/30/24 09:00
310-293962-2	S2 underliner Closed	Water	10/29/24 11:10	10/30/24 09:00

Detection Summary

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Leachate Open — Lab Sample ID: 310-293885-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	79.8		1.00		mg/L	1		9056A	Total/NA
Fluoride	0.562		0.200		mg/L	1		9056A	Total/NA
Sulfate	43.5		1.00		mg/L	1		9056A	Total/NA
Barium	0.880		0.0100		mg/L	1		6010D	Total/NA
Boron	8.90		0.200		mg/L	1		6010D	Total/NA
Calcium	133		1.00		mg/L	1		6010D	Total/NA
Iron	9.01		0.500		mg/L	1		6010D	Total/NA
Lithium	0.198		0.0500		mg/L	1		6010D	Total/NA
Magnesium	41.3		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	3.67		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	31.8		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	938		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S2 Leachate Open — Lab Sample ID: 310-293885-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	107		20.0		mg/L	20		9056A	Total/NA
Nitrate as N	0.670		0.200		mg/L	1		9056A	Total/NA
Fluoride	1.02		0.200		mg/L	1		9056A	Total/NA
Sulfate	1210		20.0		mg/L	20		9056A	Total/NA
Barium	0.0299		0.0100		mg/L	1		6010D	Total/NA
Boron	22.5		0.200		mg/L	1		6010D	Total/NA
Calcium	181		1.00		mg/L	1		6010D	Total/NA
Iron	1.20		0.500		mg/L	1		6010D	Total/NA
Lithium	1.12		0.0500		mg/L	1		6010D	Total/NA
Magnesium	143		1.00		mg/L	1		6010D	Total/NA
Molybdenum	0.0547		0.0500		mg/L	1		6010D	Total/NA
Ammonia as N	8.40		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	71.9		10.0		mg/L	2		5220D LL	Total/NA
Total Dissolved Solids	2330		250		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S1 Underliner Open — Lab Sample ID: 310-293885-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	60.2		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	2.54		0.200		mg/L	1		9056A	Total/NA
Fluoride	0.456		0.200		mg/L	1		9056A	Total/NA
Sulfate	34.1		1.00		mg/L	1		9056A	Total/NA
Barium	0.642		0.0100		mg/L	1		6010D	Total/NA
Boron	3.72		0.200		mg/L	1		6010D	Total/NA
Calcium	92.2		1.00		mg/L	1		6010D	Total/NA
Lithium	0.0743		0.0500		mg/L	1		6010D	Total/NA
Magnesium	38.0		1.00		mg/L	1		6010D	Total/NA
Chemical Oxygen Demand	18.8		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	694		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: Combined Leachate — Lab Sample ID: 310-293885-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	92.4		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	0.894		0.200		mg/L	1		9056A	Total/NA
Fluoride	1.02		0.200		mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Combined Leachate (Continued) — Lab Sample ID: 310-293885-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	616		20.0		mg/L	20		9056A	Total/NA
Barium	0.317		0.0100		mg/L	1		6010D	Total/NA
Boron	15.7		0.200		mg/L	1		6010D	Total/NA
Calcium	158		1.00		mg/L	1		6010D	Total/NA
Iron	4.37		0.500		mg/L	1		6010D	Total/NA
Lithium	0.651		0.0500		mg/L	1		6010D	Total/NA
Magnesium	93.3		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	5.34		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	49.9		10.0		mg/L	2		5220D LL	Total/NA
Total Dissolved Solids	1510		250		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-1 — Lab Sample ID: 310-293885-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	4.82		1.00		mg/L	1		9056A	Total/NA
Sulfate	23.7		1.00		mg/L	1		9056A	Total/NA
Barium	0.0853		0.0100		mg/L	1		6010D	Total/NA
Calcium	68.8		1.00		mg/L	1		6010D	Total/NA
Magnesium	37.9		1.00		mg/L	1		6010D	Total/NA
Chemical Oxygen Demand	12.3		10.0		mg/L	2		5220D LL	Total/NA
Total Dissolved Solids	340		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2 — Lab Sample ID: 310-293885-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.58		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	1.52		0.200		mg/L	1		9056A	Total/NA
Sulfate	19.9		1.00		mg/L	1		9056A	Total/NA
Barium	0.0857		0.0100		mg/L	1		6010D	Total/NA
Calcium	101		1.00		mg/L	1		6010D	Total/NA
Magnesium	42.1		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	424		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 310-293885-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	112		5.00		mg/L	5		9056A	Total/NA
Nitrate as N	0.782		0.200		mg/L	1		9056A	Total/NA
Sulfate	119		5.00		mg/L	5		9056A	Total/NA
Barium	0.0628		0.0100		mg/L	1		6010D	Total/NA
Boron	2.35		0.200		mg/L	1		6010D	Total/NA
Calcium	129		1.00		mg/L	1		6010D	Total/NA
Magnesium	59.2		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	810		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB-01 — Lab Sample ID: 310-293885-8

No Detections.

Client Sample ID: Dup-01 — Lab Sample ID: 310-293885-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.50		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	1.53	H	0.200		mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Dup-01 (Continued) — Lab Sample ID: 310-293885-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	19.6		1.00		mg/L	1		9056A	Total/NA
Barium	0.0867		0.0100		mg/L	1		6010D	Total/NA
Calcium	100		1.00		mg/L	1		6010D	Total/NA
Magnesium	43.2		1.00		mg/L	1		6010D	Total/NA
Total Dissolved Solids	408		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S1 underliner Closed — Lab Sample ID: 310-293962-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	74.9		1.00		mg/L	1		9056A	Total/NA
Nitrate as N	0.967		0.200		mg/L	1		9056A	Total/NA
Fluoride	0.640		0.200		mg/L	1		9056A	Total/NA
Sulfate	47.5		1.00		mg/L	1		9056A	Total/NA
Barium	0.677		0.0100		mg/L	1		6010D	Total/NA
Boron	8.10		0.200		mg/L	1		6010D	Total/NA
Calcium	123		1.00		mg/L	1		6010D	Total/NA
Iron	6.42		0.500		mg/L	1		6010D	Total/NA
Lithium	0.192		0.0500		mg/L	1		6010D	Total/NA
Magnesium	41.9		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	2.02		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	27.4		5.00		mg/L	1		5220D LL	Total/NA
Total Dissolved Solids	880		50.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: S2 underliner Closed — Lab Sample ID: 310-293962-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	376		20.0		mg/L	20		9056A	Total/NA
Nitrate as N	1.24		0.200		mg/L	1		9056A	Total/NA
Fluoride	1.41		0.200		mg/L	1		9056A	Total/NA
Sulfate	1380		20.0		mg/L	20		9056A	Total/NA
Barium	0.0359		0.0100		mg/L	1		6010D	Total/NA
Boron	22.7		0.200		mg/L	1		6010D	Total/NA
Calcium	190		1.00		mg/L	1		6010D	Total/NA
Iron	3.06		0.500		mg/L	1		6010D	Total/NA
Lithium	1.13		0.0500		mg/L	1		6010D	Total/NA
Magnesium	149		1.00		mg/L	1		6010D	Total/NA
Ammonia as N	8.06		0.500		mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	69.4		10.0		mg/L	2		5220D LL	Total/NA
Total Dissolved Solids	2250		250		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Leachate Open

Lab Sample ID: 310-293885-1

Date Collected: 10/28/24 11:30
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**79.8**		1.00		mg/L			10/29/24 23:22	1
Nitrate as N	<0.200		0.200		mg/L			10/29/24 23:22	1
Fluoride	**0.562**		0.200		mg/L			10/29/24 23:22	1
Sulfate	**43.5**		1.00		mg/L			10/29/24 23:22	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.880**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:33	1
Boron	**8.90**		0.200		mg/L		10/31/24 09:30	11/08/24 11:33	1
Calcium	**133**		1.00		mg/L		10/31/24 09:30	11/08/24 11:33	1
Iron	**9.01**		0.500		mg/L		10/31/24 09:30	11/08/24 11:33	1
Lithium	**0.198**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:33	1
Magnesium	**41.3**		1.00		mg/L		10/31/24 09:30	11/08/24 11:33	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**3.67**		0.500		mg/L		11/05/24 07:47	11/05/24 19:19	1
Chemical Oxygen Demand (SM 5220D LL)	**31.8**		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 21:57	1
Total Dissolved Solids (SM 2540C)	**938**		50.0		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S2 Leachate Open

Date Collected: 10/28/24 11:35
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	107		20.0		mg/L			10/30/24 00:09	20
Nitrate as N	0.670		0.200		mg/L			10/29/24 23:53	1
Fluoride	1.02		0.200		mg/L			10/29/24 23:53	1
Sulfate	1210		20.0		mg/L			10/30/24 00:09	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0299		0.0100		mg/L		10/31/24 09:30	11/08/24 11:35	1
Boron	22.5		0.200		mg/L		10/31/24 09:30	11/08/24 11:35	1
Calcium	181		1.00		mg/L		10/31/24 09:30	11/08/24 11:35	1
Iron	1.20		0.500		mg/L		10/31/24 09:30	11/08/24 11:35	1
Lithium	1.12		0.0500		mg/L		10/31/24 09:30	11/08/24 11:35	1
Magnesium	143		1.00		mg/L		10/31/24 09:30	11/08/24 11:35	1
Molybdenum	0.0547		0.0500		mg/L		10/31/24 09:30	11/08/24 11:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.40		0.500		mg/L		11/05/24 07:47	11/05/24 19:21	1
Chemical Oxygen Demand (SM 5220D LL)	71.9		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0220		0.0220		mg/L		11/01/24 09:05	11/01/24 21:58	1
Total Dissolved Solids (SM 2540C)	2330		250		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Underliner Open

Date Collected: 10/28/24 11:20
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**60.2**		1.00		mg/L			10/30/24 00:24	1
Nitrate as N	**2.54**		0.200		mg/L			10/30/24 00:24	1
Fluoride	**0.456**		0.200		mg/L			10/30/24 00:24	1
Sulfate	**34.1**		1.00		mg/L			10/30/24 00:24	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.642**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:37	1
Boron	**3.72**		0.200		mg/L		10/31/24 09:30	11/08/24 11:37	1
Calcium	**92.2**		1.00		mg/L		10/31/24 09:30	11/08/24 11:37	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:37	1
Lithium	**0.0743**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:37	1
Magnesium	**38.0**		1.00		mg/L		10/31/24 09:30	11/08/24 11:37	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		11/05/24 07:47	11/05/24 19:21	1
Chemical Oxygen Demand (SM 5220D LL)	**18.8**		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0212		0.0212		mg/L		11/01/24 09:05	11/01/24 21:59	1
Total Dissolved Solids (SM 2540C)	**694**		50.0		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Client Sample ID: Combined Leachate
Lab Sample ID: 310-293885-4
Date Collected: 10/28/24 11:45
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**92.4**		1.00		mg/L			10/30/24 07:57	1
Nitrate as N	**0.894**		0.200		mg/L			10/30/24 07:57	1
Fluoride	**1.02**		0.200		mg/L			10/30/24 07:57	1
Sulfate	**616**		20.0		mg/L			10/30/24 08:12	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.317**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:39	1
Boron	**15.7**		0.200		mg/L		10/31/24 09:30	11/08/24 11:39	1
Calcium	**158**		1.00		mg/L		10/31/24 09:30	11/08/24 11:39	1
Iron	**4.37**		0.500		mg/L		10/31/24 09:30	11/08/24 11:39	1
Lithium	**0.651**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:39	1
Magnesium	**93.3**		1.00		mg/L		10/31/24 09:30	11/08/24 11:39	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**5.34**		0.500		mg/L		11/05/24 11:57	11/06/24 02:22	1
Chemical Oxygen Demand (SM 5220D LL)	**49.9**		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0208		0.0208		mg/L		11/01/24 09:05	11/01/24 21:59	1
Total Dissolved Solids (SM 2540C)	**1510**		250		mg/L			11/01/24 16:00	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-1

Date Collected: 10/28/24 14:57
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.82**		1.00		mg/L			10/30/24 08:28	1
Nitrate as N	<0.200		0.200		mg/L			10/30/24 08:28	1
Fluoride	<0.200		0.200		mg/L			10/30/24 08:28	1
Sulfate	**23.7**		1.00		mg/L			10/30/24 08:28	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0853**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:41	1
Boron	<0.200		0.200		mg/L		10/31/24 09:30	11/08/24 11:41	1
Calcium	**68.8**		1.00		mg/L		10/31/24 09:30	11/08/24 11:41	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:41	1
Lithium	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:41	1
Magnesium	**37.9**		1.00		mg/L		10/31/24 09:30	11/08/24 11:41	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:45	1
Chemical Oxygen Demand (SM 5220D LL)	**12.3**		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:00	1
Total Dissolved Solids (SM 2540C)	**340**		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-2

Date Collected: 10/28/24 13:24
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-6

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**7.58**		1.00		mg/L			10/30/24 08:43	1
Nitrate as N	**1.52**		0.200		mg/L			10/30/24 08:43	1
Fluoride	<0.200		0.200		mg/L			10/30/24 08:43	1
Sulfate	**19.9**		1.00		mg/L			10/30/24 08:43	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0857**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:43	1
Boron	<0.200		0.200		mg/L		10/31/24 09:30	11/08/24 11:43	1
Calcium	**101**		1.00		mg/L		10/31/24 09:30	11/08/24 11:43	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:43	1
Lithium	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:43	1
Magnesium	**42.1**		1.00		mg/L		10/31/24 09:30	11/08/24 11:43	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:48	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0216		0.0216		mg/L		11/01/24 09:05	11/01/24 22:01	1
Total Dissolved Solids (SM 2540C)	**424**		50.0		mg/L			11/01/24 17:05	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-3

Date Collected: 10/28/24 11:33
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**112**		5.00		mg/L			10/30/24 09:46	5
Nitrate as N	**0.782**		0.200		mg/L			10/30/24 09:30	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:30	1
Sulfate	**119**		5.00		mg/L			10/30/24 09:46	5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0628**		0.0100		mg/L		11/01/24 09:30	11/10/24 16:58	1
Boron	**2.35**		0.200		mg/L		11/01/24 09:30	11/10/24 16:58	1
Calcium	**129**		1.00		mg/L		11/01/24 09:30	11/10/24 16:58	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 16:58	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:58	1
Magnesium	**59.2**		1.00		mg/L		11/01/24 09:30	11/10/24 16:58	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:52	1
Chemical Oxygen Demand (SM 5220D LL)	<10.0		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:01	1
Total Dissolved Solids (SM 2540C)	**810**		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Client Sample ID: EB-01
Lab Sample ID: 310-293885-8

Date Collected: 10/28/24 14:35
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/30/24 09:30	1
Nitrate as N	<0.200		0.200		mg/L			10/30/24 09:30	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:30	1
Sulfate	<1.00		1.00		mg/L			10/30/24 09:30	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		11/01/24 09:30	11/10/24 17:12	1
Boron	<0.200		0.200		mg/L		11/01/24 09:30	11/10/24 17:12	1
Calcium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 17:12	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 17:12	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:12	1
Magnesium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 17:12	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:53	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: Dup-01

Date Collected: 10/28/24 00:00
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-9

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**7.50**		1.00		mg/L			10/30/24 09:46	1
Nitrate as N	**1.53**	**H**	0.200		mg/L			10/30/24 09:46	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:46	1
Sulfate	**19.6**		1.00		mg/L			10/30/24 09:46	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0867**		0.0100		mg/L		11/01/24 09:30	11/10/24 17:14	1
Boron	<0.200		0.200		mg/L		11/01/24 09:30	11/10/24 17:14	1
Calcium	**100**		1.00		mg/L		11/01/24 09:30	11/10/24 17:14	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 17:14	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:14	1
Magnesium	**43.2**		1.00		mg/L		11/01/24 09:30	11/10/24 17:14	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:54	1
Chemical Oxygen Demand (SM 5220D LL)	<10.0		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	**408**		50.0		mg/L			11/01/24 17:05	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 underliner Closed

Date Collected: 10/29/24 11:05
Date Received: 10/30/24 09:00

Lab Sample ID: 310-293962-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**74.9**		1.00		mg/L			10/30/24 14:26	1
Nitrate as N	**0.967**		0.200		mg/L			10/30/24 14:26	1
Fluoride	**0.640**		0.200		mg/L			10/30/24 14:26	1
Sulfate	**47.5**		1.00		mg/L			10/30/24 14:26	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.677**		0.0100		mg/L		11/01/24 09:30	11/10/24 17:16	1
Boron	**8.10**		0.200		mg/L		11/01/24 09:30	11/10/24 17:16	1
Calcium	**123**		1.00		mg/L		11/01/24 09:30	11/10/24 17:16	1
Iron	**6.42**		0.500		mg/L		11/01/24 09:30	11/10/24 17:16	1
Lithium	**0.192**		0.0500		mg/L		11/01/24 09:30	11/10/24 17:16	1
Magnesium	**41.9**		1.00		mg/L		11/01/24 09:30	11/10/24 17:16	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**2.02**		0.500		mg/L		11/05/24 07:47	11/05/24 20:22	1
Chemical Oxygen Demand (SM 5220D LL)	**27.4**		5.00		mg/L			11/07/24 10:17	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	**880**		50.0		mg/L			11/02/24 13:46	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S2 underliner Closed

Date Collected: 10/29/24 11:10
Date Received: 10/30/24 09:00

Lab Sample ID: 310-293962-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	376		20.0		mg/L			10/30/24 14:11	20
Nitrate as N	1.24		0.200		mg/L			10/30/24 13:55	1
Fluoride	1.41		0.200		mg/L			10/30/24 13:55	1
Sulfate	1380		20.0		mg/L			10/30/24 14:11	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0359		0.0100		mg/L		11/01/24 09:30	11/10/24 17:18	1
Boron	22.7		0.200		mg/L		11/01/24 09:30	11/10/24 17:18	1
Calcium	190		1.00		mg/L		11/01/24 09:30	11/10/24 17:18	1
Iron	3.06		0.500		mg/L		11/01/24 09:30	11/10/24 17:18	1
Lithium	1.13		0.0500		mg/L		11/01/24 09:30	11/10/24 17:18	1
Magnesium	149		1.00		mg/L		11/01/24 09:30	11/10/24 17:18	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.06		0.500		mg/L		11/05/24 07:47	11/05/24 19:18	1
Chemical Oxygen Demand (SM 5220D LL)	69.4		10.0		mg/L			11/07/24 10:17	2
Phenols, Total (SW846 9066)	<0.0212		0.0212		mg/L		11/01/24 09:05	11/01/24 22:03	1
Total Dissolved Solids (SM 2540C)	2250		250		mg/L			11/02/24 13:46	1

Definitions/Glossary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-438483/3
Matrix: Water
Analysis Batch: 438483

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/29/24 21:02	1
Nitrate as N	<0.200		0.200		mg/L			10/29/24 21:02	1
Fluoride	<0.200		0.200		mg/L			10/29/24 21:02	1
Sulfate	<1.00		1.00		mg/L			10/29/24 21:02	1

Lab Sample ID: LCS 310-438483/4
Matrix: Water
Analysis Batch: 438483

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.171		mg/L		92	90 - 110
Nitrate as N	2.00	2.051		mg/L		103	90 - 110
Fluoride	2.00	1.942		mg/L		97	90 - 110
Sulfate	10.0	9.871		mg/L		99	90 - 110

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 310-438107/1-A
Matrix: Water
Analysis Batch: 439150

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438107

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		10/31/24 09:30	11/08/24 10:19	1
Boron	<0.200		0.200		mg/L		10/31/24 09:30	11/08/24 10:19	1
Calcium	<1.00		1.00		mg/L		10/31/24 09:30	11/08/24 10:19	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 10:19	1
Lithium	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 10:19	1
Magnesium	<1.00		1.00		mg/L		10/31/24 09:30	11/08/24 10:19	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 10:19	1

Lab Sample ID: LCS 310-438107/2-A
Matrix: Water
Analysis Batch: 439150

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438107

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	1.00	0.9845		mg/L		98	80 - 120
Boron	2.00	1.989		mg/L		99	80 - 120
Calcium	20.0	19.46		mg/L		97	80 - 120
Iron	2.00	2.003		mg/L		100	80 - 120
Lithium	2.00	1.942		mg/L		97	80 - 120
Magnesium	20.0	19.10		mg/L		95	80 - 120
Molybdenum	2.00	2.016		mg/L		101	80 - 120

Lab Sample ID: MB 310-438269/1-A
Matrix: Water
Analysis Batch: 439249

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438269

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		11/01/24 09:30	11/10/24 16:54	1
Boron	<0.200		0.200		mg/L		11/01/24 09:30	11/10/24 16:54	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: MB 310-438269/1-A
Matrix: Water
Analysis Batch: 439249

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438269

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 16:54	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 16:54	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:54	1
Magnesium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 16:54	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:54	1

Lab Sample ID: LCS 310-438269/2-A
Matrix: Water
Analysis Batch: 439249

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438269

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	1.00	0.9543		mg/L		95	80 - 120
Boron	2.00	1.907		mg/L		95	80 - 120
Calcium	20.0	18.47		mg/L		92	80 - 120
Iron	2.00	1.925		mg/L		96	80 - 120
Lithium	2.00	1.850		mg/L		92	80 - 120
Magnesium	20.0	18.79		mg/L		94	80 - 120
Molybdenum	2.00	1.906		mg/L		95	80 - 120

Lab Sample ID: 310-293885-7 MS
Matrix: Water
Analysis Batch: 439249

Client Sample ID: MW-3
Prep Type: Total/NA
Prep Batch: 438269

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	0.0628		1.00	1.021		mg/L		96	75 - 125
Boron	2.35		2.00	4.317		mg/L		99	75 - 125
Calcium	129		20.0	148.2	4	mg/L		93	75 - 125
Iron	<0.500		2.00	2.203		mg/L		97	75 - 125
Lithium	<0.0500		2.00	1.916		mg/L		94	75 - 125
Magnesium	59.2		20.0	78.57		mg/L		97	75 - 125
Molybdenum	<0.0500		2.00	1.901		mg/L		95	75 - 125

Lab Sample ID: 310-293885-7 MSD
Matrix: Water
Analysis Batch: 439249

Client Sample ID: MW-3
Prep Type: Total/NA
Prep Batch: 438269

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	0.0628		1.00	1.075		mg/L		101	75 - 125	5	20
Boron	2.35		2.00	4.507		mg/L		108	75 - 125	4	20
Calcium	129		20.0	153.3	4	mg/L		119	75 - 125	3	20
Iron	<0.500		2.00	2.331		mg/L		103	75 - 125	6	20
Lithium	<0.0500		2.00	2.018		mg/L		99	75 - 125	5	20
Magnesium	59.2		20.0	81.52		mg/L		111	75 - 125	4	20
Molybdenum	<0.0500		2.00	1.999		mg/L		100	75 - 125	5	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 310-438137/175
Matrix: Water
Analysis Batch: 438137

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.200		0.200		mg/L			10/30/24 22:28	1

Lab Sample ID: MB 310-438137/219
Matrix: Water
Analysis Batch: 438137

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.200		0.200		mg/L			10/31/24 00:47	1

Lab Sample ID: LCS 310-438137/176
Matrix: Water
Analysis Batch: 438137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	8.55	8.616		mg/L		101	90 - 110

Lab Sample ID: LCS 310-438137/220
Matrix: Water
Analysis Batch: 438137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	8.55	8.639		mg/L		101	90 - 110

Lab Sample ID: 310-293885-6 MS
Matrix: Water
Analysis Batch: 438137

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	<0.200		1.00	0.9764		mg/L		98	90 - 110

Lab Sample ID: 310-293885-6 MSD
Matrix: Water
Analysis Batch: 438137

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia as N	<0.200		1.00	0.9573		mg/L		96	90 - 110	2	13

Lab Sample ID: MB 310-438656/1-A
Matrix: Water
Analysis Batch: 438779

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.500		0.500		mg/L		11/05/24 07:47	11/05/24 19:09	1

Lab Sample ID: LCS 310-438656/2-A
Matrix: Water
Analysis Batch: 438779

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	4.00	3.809		mg/L		95	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 310-438716/1-A
Matrix: Water
Analysis Batch: 438784

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438716

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N	<0.500		0.500		mg/L		11/05/24 11:57	11/06/24 02:15	1

Lab Sample ID: LCS 310-438716/2-A
Matrix: Water
Analysis Batch: 438784

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438716

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia as N	4.00	4.184		mg/L		105	90 - 110

Method: 5220D LL - COD

Lab Sample ID: MB 310-438691/32
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			11/05/24 10:34	1

Lab Sample ID: MB 310-438691/60
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			11/05/24 10:34	1

Lab Sample ID: MB 310-438691/90
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			11/05/24 10:34	1

Lab Sample ID: LCS 310-438691/33
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	130.5		mg/L		104	85 - 110

Lab Sample ID: LCS 310-438691/63
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	130.8		mg/L		104	85 - 110

Method: 5220D LL - COD (Continued)

Lab Sample ID: 310-293885-9 MS
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Dup-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	<10.0		100	125.3		mg/L		125	83 - 146

Lab Sample ID: 310-293885-9 MSD
Matrix: Water
Analysis Batch: 438691

Client Sample ID: Dup-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	<10.0		100	127.3		mg/L		127	83 - 146	2	18

Lab Sample ID: MB 310-438975/32
Matrix: Water
Analysis Batch: 438975

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			11/07/24 10:17	1

Lab Sample ID: MB 310-438975/5
Matrix: Water
Analysis Batch: 438975

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	<5.00		5.00		mg/L			11/07/24 10:17	1

Lab Sample ID: LCS 310-438975/3
Matrix: Water
Analysis Batch: 438975

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	130.8		mg/L		104	85 - 110

Lab Sample ID: LCS 310-438975/91
Matrix: Water
Analysis Batch: 438975

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	125	131.8		mg/L		105	85 - 110

Method: 9066 - Phenolics, Total Recoverable

Lab Sample ID: MB 310-438340/1-A
Matrix: Water
Analysis Batch: 438471

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438340

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenols, Total	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 21:56	1

Method: 9066 - Phenolics, Total Recoverable (Continued)

Lab Sample ID: LCS 310-438340/25-A
Matrix: Water
Analysis Batch: 438471

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438340

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenols, Total			0.100	0.09528		mg/L		95	90 - 110		

Lab Sample ID: 310-293885-1 MS
Matrix: Water
Analysis Batch: 438471

Client Sample ID: S1 Leachate Open
Prep Type: Total/NA
Prep Batch: 438340

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenols, Total	<0.0200		0.100	0.09408		mg/L		94	76 - 119		

Lab Sample ID: 310-293885-1 MSD
Matrix: Water
Analysis Batch: 438471

Client Sample ID: S1 Leachate Open
Prep Type: Total/NA
Prep Batch: 438340

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Phenols, Total	<0.0200		0.100	0.09807		mg/L		98	76 - 119	4	16

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-438285/1
Matrix: Water
Analysis Batch: 438285

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			10/31/24 17:16	1

Lab Sample ID: LCS 310-438285/2
Matrix: Water
Analysis Batch: 438285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	988.0		mg/L		99	88 - 110		

Lab Sample ID: 310-293885-2 DU
Matrix: Water
Analysis Batch: 438285

Client Sample ID: S2 Leachate Open
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	2330			2370		mg/L				2	16

Lab Sample ID: MB 310-438459/1
Matrix: Water
Analysis Batch: 438459

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			11/01/24 16:00	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 310-438459/2
Matrix: Water
Analysis Batch: 438459

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	980.0		mg/L		98	88 - 110

Lab Sample ID: MB 310-438461/1
Matrix: Water
Analysis Batch: 438461

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			11/01/24 17:05	1

Lab Sample ID: LCS 310-438461/2
Matrix: Water
Analysis Batch: 438461

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	980.0		mg/L		98	88 - 110

Lab Sample ID: MB 310-438481/1
Matrix: Water
Analysis Batch: 438481

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			11/02/24 13:46	1

Lab Sample ID: LCS 310-438481/2
Matrix: Water
Analysis Batch: 438481

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	970.0		mg/L		97	88 - 110

QC Association Summary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

HPLC/IC

Analysis Batch: 438483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	9056A	
310-293885-2	S2 Leachate Open	Total/NA	Water	9056A	
310-293885-2	S2 Leachate Open	Total/NA	Water	9056A	
310-293885-3	S1 Underliner Open	Total/NA	Water	9056A	
310-293885-4	Combined Leachate	Total/NA	Water	9056A	
310-293885-4	Combined Leachate	Total/NA	Water	9056A	
310-293885-5	MW-1	Total/NA	Water	9056A	
310-293885-6	MW-2	Total/NA	Water	9056A	
310-293885-7	MW-3	Total/NA	Water	9056A	
310-293885-7	MW-3	Total/NA	Water	9056A	
310-293885-8	EB-01	Total/NA	Water	9056A	
310-293885-9	Dup-01	Total/NA	Water	9056A	
310-293962-1	S1 underliner Closed	Total/NA	Water	9056A	
310-293962-2	S2 underliner Closed	Total/NA	Water	9056A	
310-293962-2	S2 underliner Closed	Total/NA	Water	9056A	
MB 310-438483/3	Method Blank	Total/NA	Water	9056A	
LCS 310-438483/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 438107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	3005A	
310-293885-2	S2 Leachate Open	Total/NA	Water	3005A	
310-293885-3	S1 Underliner Open	Total/NA	Water	3005A	
310-293885-4	Combined Leachate	Total/NA	Water	3005A	
310-293885-5	MW-1	Total/NA	Water	3005A	
310-293885-6	MW-2	Total/NA	Water	3005A	
MB 310-438107/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-438107/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 438269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-7	MW-3	Total/NA	Water	3005A	
310-293885-8	EB-01	Total/NA	Water	3005A	
310-293885-9	Dup-01	Total/NA	Water	3005A	
310-293962-1	S1 underliner Closed	Total/NA	Water	3005A	
310-293962-2	S2 underliner Closed	Total/NA	Water	3005A	
MB 310-438269/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-438269/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-293885-7 MS	MW-3	Total/NA	Water	3005A	
310-293885-7 MSD	MW-3	Total/NA	Water	3005A	

Analysis Batch: 439150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	6010D	438107
310-293885-2	S2 Leachate Open	Total/NA	Water	6010D	438107
310-293885-3	S1 Underliner Open	Total/NA	Water	6010D	438107
310-293885-4	Combined Leachate	Total/NA	Water	6010D	438107
310-293885-5	MW-1	Total/NA	Water	6010D	438107
310-293885-6	MW-2	Total/NA	Water	6010D	438107

Metals (Continued)

Analysis Batch: 439150 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-438107/1-A	Method Blank	Total/NA	Water	6010D	438107
LCS 310-438107/2-A	Lab Control Sample	Total/NA	Water	6010D	438107

Analysis Batch: 439201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	6010D	438107
310-293885-2	S2 Leachate Open	Total/NA	Water	6010D	438107
310-293885-3	S1 Underliner Open	Total/NA	Water	6010D	438107
310-293885-4	Combined Leachate	Total/NA	Water	6010D	438107
310-293885-5	MW-1	Total/NA	Water	6010D	438107
310-293885-6	MW-2	Total/NA	Water	6010D	438107
MB 310-438107/1-A	Method Blank	Total/NA	Water	6010D	438107
LCS 310-438107/2-A	Lab Control Sample	Total/NA	Water	6010D	438107

Analysis Batch: 439249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-7	MW-3	Total/NA	Water	6010D	438269
310-293885-8	EB-01	Total/NA	Water	6010D	438269
310-293885-9	Dup-01	Total/NA	Water	6010D	438269
310-293962-1	S1 underliner Closed	Total/NA	Water	6010D	438269
310-293962-2	S2 underliner Closed	Total/NA	Water	6010D	438269
MB 310-438269/1-A	Method Blank	Total/NA	Water	6010D	438269
LCS 310-438269/2-A	Lab Control Sample	Total/NA	Water	6010D	438269
310-293885-7 MS	MW-3	Total/NA	Water	6010D	438269
310-293885-7 MSD	MW-3	Total/NA	Water	6010D	438269

General Chemistry

Analysis Batch: 438137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-5	MW-1	Total/NA	Water	350.1	
310-293885-6	MW-2	Total/NA	Water	350.1	
310-293885-7	MW-3	Total/NA	Water	350.1	
310-293885-8	EB-01	Total/NA	Water	350.1	
310-293885-9	Dup-01	Total/NA	Water	350.1	
MB 310-438137/175	Method Blank	Total/NA	Water	350.1	
MB 310-438137/219	Method Blank	Total/NA	Water	350.1	
LCS 310-438137/176	Lab Control Sample	Total/NA	Water	350.1	
LCS 310-438137/220	Lab Control Sample	Total/NA	Water	350.1	
310-293885-6 MS	MW-2	Total/NA	Water	350.1	
310-293885-6 MSD	MW-2	Total/NA	Water	350.1	

Analysis Batch: 438285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	SM 2540C	
310-293885-2	S2 Leachate Open	Total/NA	Water	SM 2540C	
310-293885-3	S1 Underliner Open	Total/NA	Water	SM 2540C	
MB 310-438285/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-438285/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-293885-2 DU	S2 Leachate Open	Total/NA	Water	SM 2540C	

General Chemistry

Prep Batch: 438340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	Distill/Phenol	
310-293885-2	S2 Leachate Open	Total/NA	Water	Distill/Phenol	
310-293885-3	S1 Underliner Open	Total/NA	Water	Distill/Phenol	
310-293885-4	Combined Leachate	Total/NA	Water	Distill/Phenol	
310-293885-5	MW-1	Total/NA	Water	Distill/Phenol	
310-293885-6	MW-2	Total/NA	Water	Distill/Phenol	
310-293885-7	MW-3	Total/NA	Water	Distill/Phenol	
310-293885-8	EB-01	Total/NA	Water	Distill/Phenol	
310-293885-9	Dup-01	Total/NA	Water	Distill/Phenol	
310-293962-1	S1 underliner Closed	Total/NA	Water	Distill/Phenol	
310-293962-2	S2 underliner Closed	Total/NA	Water	Distill/Phenol	
MB 310-438340/1-A	Method Blank	Total/NA	Water	Distill/Phenol	
LCS 310-438340/25-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
310-293885-1 MS	S1 Leachate Open	Total/NA	Water	Distill/Phenol	
310-293885-1 MSD	S1 Leachate Open	Total/NA	Water	Distill/Phenol	

Analysis Batch: 438459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-4	Combined Leachate	Total/NA	Water	SM 2540C	
MB 310-438459/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-438459/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 438461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-5	MW-1	Total/NA	Water	SM 2540C	
310-293885-6	MW-2	Total/NA	Water	SM 2540C	
310-293885-7	MW-3	Total/NA	Water	SM 2540C	
310-293885-8	EB-01	Total/NA	Water	SM 2540C	
310-293885-9	Dup-01	Total/NA	Water	SM 2540C	
MB 310-438461/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-438461/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 438471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	9066	438340
310-293885-2	S2 Leachate Open	Total/NA	Water	9066	438340
310-293885-3	S1 Underliner Open	Total/NA	Water	9066	438340
310-293885-4	Combined Leachate	Total/NA	Water	9066	438340
310-293885-5	MW-1	Total/NA	Water	9066	438340
310-293885-6	MW-2	Total/NA	Water	9066	438340
310-293885-7	MW-3	Total/NA	Water	9066	438340
310-293885-8	EB-01	Total/NA	Water	9066	438340
310-293885-9	Dup-01	Total/NA	Water	9066	438340
310-293962-1	S1 underliner Closed	Total/NA	Water	9066	438340
310-293962-2	S2 underliner Closed	Total/NA	Water	9066	438340
MB 310-438340/1-A	Method Blank	Total/NA	Water	9066	438340
LCS 310-438340/25-A	Lab Control Sample	Total/NA	Water	9066	438340
310-293885-1 MS	S1 Leachate Open	Total/NA	Water	9066	438340
310-293885-1 MSD	S1 Leachate Open	Total/NA	Water	9066	438340

General Chemistry

Analysis Batch: 438481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293962-1	S1 underliner Closed	Total/NA	Water	SM 2540C	
310-293962-2	S2 underliner Closed	Total/NA	Water	SM 2540C	
MB 310-438481/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-438481/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Prep Batch: 438656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	350.1	
310-293885-2	S2 Leachate Open	Total/NA	Water	350.1	
310-293885-3	S1 Underliner Open	Total/NA	Water	350.1	
310-293962-1	S1 underliner Closed	Total/NA	Water	350.1	
310-293962-2	S2 underliner Closed	Total/NA	Water	350.1	
MB 310-438656/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-438656/2-A	Lab Control Sample	Total/NA	Water	350.1	

Analysis Batch: 438691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	5220D LL	
310-293885-2	S2 Leachate Open	Total/NA	Water	5220D LL	
310-293885-3	S1 Underliner Open	Total/NA	Water	5220D LL	
310-293885-4	Combined Leachate	Total/NA	Water	5220D LL	
310-293885-5	MW-1	Total/NA	Water	5220D LL	
310-293885-6	MW-2	Total/NA	Water	5220D LL	
310-293885-7	MW-3	Total/NA	Water	5220D LL	
310-293885-8	EB-01	Total/NA	Water	5220D LL	
310-293885-9	Dup-01	Total/NA	Water	5220D LL	
MB 310-438691/32	Method Blank	Total/NA	Water	5220D LL	
MB 310-438691/60	Method Blank	Total/NA	Water	5220D LL	
MB 310-438691/90	Method Blank	Total/NA	Water	5220D LL	
LCS 310-438691/33	Lab Control Sample	Total/NA	Water	5220D LL	
LCS 310-438691/63	Lab Control Sample	Total/NA	Water	5220D LL	
310-293885-9 MS	Dup-01	Total/NA	Water	5220D LL	
310-293885-9 MSD	Dup-01	Total/NA	Water	5220D LL	

Prep Batch: 438716

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-4	Combined Leachate	Total/NA	Water	350.1	
MB 310-438716/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-438716/2-A	Lab Control Sample	Total/NA	Water	350.1	

Analysis Batch: 438779

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-1	S1 Leachate Open	Total/NA	Water	350.1	438656
310-293885-2	S2 Leachate Open	Total/NA	Water	350.1	438656
310-293885-3	S1 Underliner Open	Total/NA	Water	350.1	438656
310-293962-1	S1 underliner Closed	Total/NA	Water	350.1	438656
310-293962-2	S2 underliner Closed	Total/NA	Water	350.1	438656
MB 310-438656/1-A	Method Blank	Total/NA	Water	350.1	438656
LCS 310-438656/2-A	Lab Control Sample	Total/NA	Water	350.1	438656

QC Association Summary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

General Chemistry

Analysis Batch: 438784

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293885-4	Combined Leachate	Total/NA	Water	350.1	438716
MB 310-438716/1-A	Method Blank	Total/NA	Water	350.1	438716
LCS 310-438716/2-A	Lab Control Sample	Total/NA	Water	350.1	438716

Analysis Batch: 438975

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-293962-1	S1 underliner Closed	Total/NA	Water	5220D LL	
310-293962-2	S2 underliner Closed	Total/NA	Water	5220D LL	
MB 310-438975/32	Method Blank	Total/NA	Water	5220D LL	
MB 310-438975/5	Method Blank	Total/NA	Water	5220D LL	
LCS 310-438975/3	Lab Control Sample	Total/NA	Water	5220D LL	
LCS 310-438975/91	Lab Control Sample	Total/NA	Water	5220D LL	

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Leachate Open

Lab Sample ID: 310-293885-1
Matrix: Water
Date Collected: 10/28/24 11:30
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/29/24 23:22
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:33
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:33
Total/NA	Prep	350.1			438656	MQ8M	EET CF	11/05/24 07:47
Total/NA	Analysis	350.1		1	438779	ZJX4	EET CF	11/05/24 19:19
Total/NA	Analysis	5220D LL		1	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 21:57
Total/NA	Analysis	SM 2540C		1	438285	XJ7V	EET CF	10/31/24 17:16

Client Sample ID: S2 Leachate Open

Lab Sample ID: 310-293885-2
Matrix: Water
Date Collected: 10/28/24 11:35
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/29/24 23:53
Total/NA	Analysis	9056A		20	438483	WZC8	EET CF	10/30/24 00:09
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:35
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:35
Total/NA	Prep	350.1			438656	MQ8M	EET CF	11/05/24 07:47
Total/NA	Analysis	350.1		1	438779	ZJX4	EET CF	11/05/24 19:21
Total/NA	Analysis	5220D LL		2	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 21:58
Total/NA	Analysis	SM 2540C		1	438285	XJ7V	EET CF	10/31/24 17:16

Client Sample ID: S1 Underliner Open

Lab Sample ID: 310-293885-3
Matrix: Water
Date Collected: 10/28/24 11:20
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 00:24
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:37
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:37
Total/NA	Prep	350.1			438656	MQ8M	EET CF	11/05/24 07:47
Total/NA	Analysis	350.1		1	438779	ZJX4	EET CF	11/05/24 19:21
Total/NA	Analysis	5220D LL		1	438691	HE7K	EET CF	11/05/24 10:34

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Underliner Open

Lab Sample ID: 310-293885-3
Matrix: Water
Date Collected: 10/28/24 11:20
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 21:59
Total/NA	Analysis	SM 2540C		1	438285	XJ7V	EET CF	10/31/24 17:16

Client Sample ID: Combined Leachate

Lab Sample ID: 310-293885-4
Matrix: Water
Date Collected: 10/28/24 11:45
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 07:57
Total/NA	Analysis	9056A		20	438483	WZC8	EET CF	10/30/24 08:12
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:39
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:39
Total/NA	Prep	350.1			438716	MQ8M	EET CF	11/05/24 11:57
Total/NA	Analysis	350.1		1	438784	ZJX4	EET CF	11/06/24 02:22
Total/NA	Analysis	5220D LL		2	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 21:59
Total/NA	Analysis	SM 2540C		1	438459	XJ7V	EET CF	11/01/24 16:00

Client Sample ID: MW-1

Lab Sample ID: 310-293885-5
Matrix: Water
Date Collected: 10/28/24 14:57
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 08:28
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:41
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:41
Total/NA	Analysis	350.1		1	438137	ZJX4	EET CF	10/31/24 00:45
Total/NA	Analysis	5220D LL		2	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:00
Total/NA	Analysis	SM 2540C		1	438461	XJ7V	EET CF	11/01/24 17:05

Client Sample ID: MW-2

Lab Sample ID: 310-293885-6
Matrix: Water
Date Collected: 10/28/24 13:24
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 08:43

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-2

Lab Sample ID: 310-293885-6

Date Collected: 10/28/24 13:24

Matrix: Water

Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439150	ZRI4	EET CF	11/08/24 11:43
Total/NA	Prep	3005A			438107	F5MW	EET CF	10/31/24 09:30
Total/NA	Analysis	6010D		1	439201	ZRI4	EET CF	11/08/24 11:43
Total/NA	Analysis	350.1		1	438137	ZJX4	EET CF	10/31/24 00:48
Total/NA	Analysis	5220D LL		1	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:01
Total/NA	Analysis	SM 2540C		1	438461	XJ7V	EET CF	11/01/24 17:05

Client Sample ID: MW-3

Lab Sample ID: 310-293885-7

Date Collected: 10/28/24 11:33

Matrix: Water

Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 09:30
Total/NA	Analysis	9056A		5	438483	WZC8	EET CF	10/30/24 09:46
Total/NA	Prep	3005A			438269	F5MW	EET CF	11/01/24 09:30
Total/NA	Analysis	6010D		1	439249	ZRI4	EET CF	11/10/24 16:58
Total/NA	Analysis	350.1		1	438137	ZJX4	EET CF	10/31/24 00:52
Total/NA	Analysis	5220D LL		2	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:01
Total/NA	Analysis	SM 2540C		1	438461	XJ7V	EET CF	11/01/24 17:05

Client Sample ID: EB-01

Lab Sample ID: 310-293885-8

Date Collected: 10/28/24 14:35

Matrix: Water

Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 09:30
Total/NA	Prep	3005A			438269	F5MW	EET CF	11/01/24 09:30
Total/NA	Analysis	6010D		1	439249	ZRI4	EET CF	11/10/24 17:12
Total/NA	Analysis	350.1		1	438137	ZJX4	EET CF	10/31/24 00:53
Total/NA	Analysis	5220D LL		1	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:02
Total/NA	Analysis	SM 2540C		1	438461	XJ7V	EET CF	11/01/24 17:05

Lab Chronicle

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: Dup-01

Lab Sample ID: 310-293885-9
Matrix: Water
Date Collected: 10/28/24 00:00
Date Received: 10/29/24 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 09:46
Total/NA	Prep	3005A			438269	F5MW	EET CF	11/01/24 09:30
Total/NA	Analysis	6010D		1	439249	ZRI4	EET CF	11/10/24 17:14
Total/NA	Analysis	350.1		1	438137	ZJX4	EET CF	10/31/24 00:54
Total/NA	Analysis	5220D LL		2	438691	HE7K	EET CF	11/05/24 10:34
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:02
Total/NA	Analysis	SM 2540C		1	438461	XJ7V	EET CF	11/01/24 17:05

Client Sample ID: S1 underliner Closed

Lab Sample ID: 310-293962-1
Matrix: Water
Date Collected: 10/29/24 11:05
Date Received: 10/30/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 14:26
Total/NA	Prep	3005A			438269	F5MW	EET CF	11/01/24 09:30
Total/NA	Analysis	6010D		1	439249	ZRI4	EET CF	11/10/24 17:16
Total/NA	Prep	350.1			438656	MQ8M	EET CF	11/05/24 07:47
Total/NA	Analysis	350.1		1	438779	ZJX4	EET CF	11/05/24 20:22
Total/NA	Analysis	5220D LL		1	438975	HE7K	EET CF	11/07/24 10:17
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:02
Total/NA	Analysis	SM 2540C		1	438481	XJ7V	EET CF	11/02/24 13:46

Client Sample ID: S2 underliner Closed

Lab Sample ID: 310-293962-2
Matrix: Water
Date Collected: 10/29/24 11:10
Date Received: 10/30/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	438483	WZC8	EET CF	10/30/24 13:55
Total/NA	Analysis	9056A		20	438483	WZC8	EET CF	10/30/24 14:11
Total/NA	Prep	3005A			438269	F5MW	EET CF	11/01/24 09:30
Total/NA	Analysis	6010D		1	439249	ZRI4	EET CF	11/10/24 17:18
Total/NA	Prep	350.1			438656	MQ8M	EET CF	11/05/24 07:47
Total/NA	Analysis	350.1		1	438779	ZJX4	EET CF	11/05/24 19:18
Total/NA	Analysis	5220D LL		2	438975	HE7K	EET CF	11/07/24 10:17
Total/NA	Prep	Distill/Phenol			438340	HE7K	EET CF	11/01/24 09:05
Total/NA	Analysis	9066		1	438471	ZJX4	EET CF	11/01/24 22:03
Total/NA	Analysis	SM 2540C		1	438481	XJ7V	EET CF	11/02/24 13:46

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Method Summary

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
350.1	Nitrogen, Ammonia	EPA	EET CF
5220D LL	COD	SM	EET CF
9066	Phenolics, Total Recoverable	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
350.1	Distillation, Ammonia	EPA	EET CF
Distill/Phenol	Distillation, Phenolics	None	EET CF

Protocol References:

EPA = US Environmental Protection Agency

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-293885 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC Environmental

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 10/29/24 | TIME 0850 | Received By: JJ

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 1 of 2
Cooler Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: L | Correction Factor (°C): +0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.9 | Corrected Temp (°C): 2.9

Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC Environmental

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 10/29/24 | TIME 0850 | Received By: JJ

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # 2 of 2

Cooler Custody Seals Present? ☐ Yes ☒ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: L | Correction Factor (°C): +0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 5.2 | Corrected Temp (°C): 5.2

Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g , bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Maddie Mulcahy	Lab PM: Calhoun, Conner M	Carrier Tracking No(s):	COC No: 310-86419-24126.2
Client Contact: Chris Frauen	Phone: 608-509-5097	E-Mail: Conner.Calhoun@et.eurofinsus.com	State of Origin: IA	Page: Page 1 of 1
Company: TRC Environmental Corporation	PWSID:			Job #:
Address: 999 Fourier Drive, Suite 101	Due Date Requested:			
City: Madison	TAT Requested (days): 10 day			
State, Zip: WI, 53717	Compliance Project: ∆ Yes ☒ No			
Phone: 563-589-6133(Tel)	PO #: 4512880175 00030			
Email: CFrauen@trccompanies.com	WO #:			
Project Name: JD DUB - TRC (Landfill)	Eurofins Project #: 31002706			
Site: JDWW - Dubuque	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 Ammonia and 5220D_LL COD	9056A_ORGFM_28D- Chloride, Fluoride, Sulfate	9056A_ORGFM_48H- Nitrate	8260B - Volatile Appendix 2 Sublist	Total 6010D Metals - Ba, B, Ca, Fe, Li, Mg, Mo	Total Filtered Metals - Ba, B, Ca, Fe, Li, Mg, Mo	9066 - Total Recoverable Phenolics	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	N	N	A	D	S	S		
S1 Leachate open	10/28/24	1130	G	Water			X	X	X		X		X		Nitrate- 48HR Hold time
S2 Leachate Open		1135		Water			X	X	X		X		X		
S1 underliner open		1120		Water			X	X	X		X		X		
combined Leachate		1145		Water			X	X	X		X		X		
MW-1		1457		Water			X	X	X		X		X		
MW-2		1324		Water			X	X	X		X		X		
MW-3		1133		Water			X	X	X		X		X		
EB-01		1435		Water			X	X	X		X		X		
DUP-01		—		Water			X	X	X		X		X		
Temp blank				Water											
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	1430 10/28/24				
2						
3				[signature]	10/29/24 0850	

Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks:

V... 01.16.2019

eurofins | Environment Testing America

310-293962 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: TRC

City/State: CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 10/30/24 TIME 900 Received By: PH

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☒ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☐ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.1 Corrected Temp (°C): 1.1

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g , bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Maddie Holicky	Lab PM: Calhoun, Conner M	Carrier Tracking No(s):	COC No: 310-86419-24126 2
Client Contact: Chris Frauen	Phone: 606-509-5097	E-Mail: Conner.Calhoun@et.eurofinsus.com	State of Origin: IA	Page: Page 2 of 2
Company: TRC Environmental Corporation	PWSID:			Job #:
Address: 999 Fourier Drive, Suite 101	Due Date Requested: 10 day			
City: Madison	TAT Requested (days): 6			
State, Zip: WI, 53717	Compliance Project: Δ Yes X No			
Phone: 563-589-6133(Tel)	PO #: 4512880175 00030			
Email: CFrauen@trccompanies.com	WO #:			
Project Name: JD DUB - TRC (Landfill)	Eurofins Project #: 31002706			
Site: JDWW Dubuque	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 Ammonia and 5220D_LL COD	9056A_ORGFM_28D- Chloride, Fluoride, Sulfate	9056A_ORGFM_48H- Nitrate	Appdix 2 Volatile Appendix 2 semivolat	Total 6010D Metals- Ba, B, Ca, Fe, Li, Mg, Mo	Field Filtered Dissolved Ba, B, Ca, Fe, Li, Mg, Mo	9066 - Total Recoverable Phenolics	2540C - Total dissolved solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	N	N	A	D	G	S	N		
S1 underliner closed	10/29/24	1105	G	Water			X	X	X		X		X	X		Nitrate- 48HR Hold time
S2 underliner closed	↓	1110	↓	Water			X	X	X		X		X	X		
Temp blank				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Maddie Holicky	10/29/24 1688				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/30/24 0900	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: John Deere & Co

Job Number: 310-293885-1
SDG Number:

Login Number: 293885
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

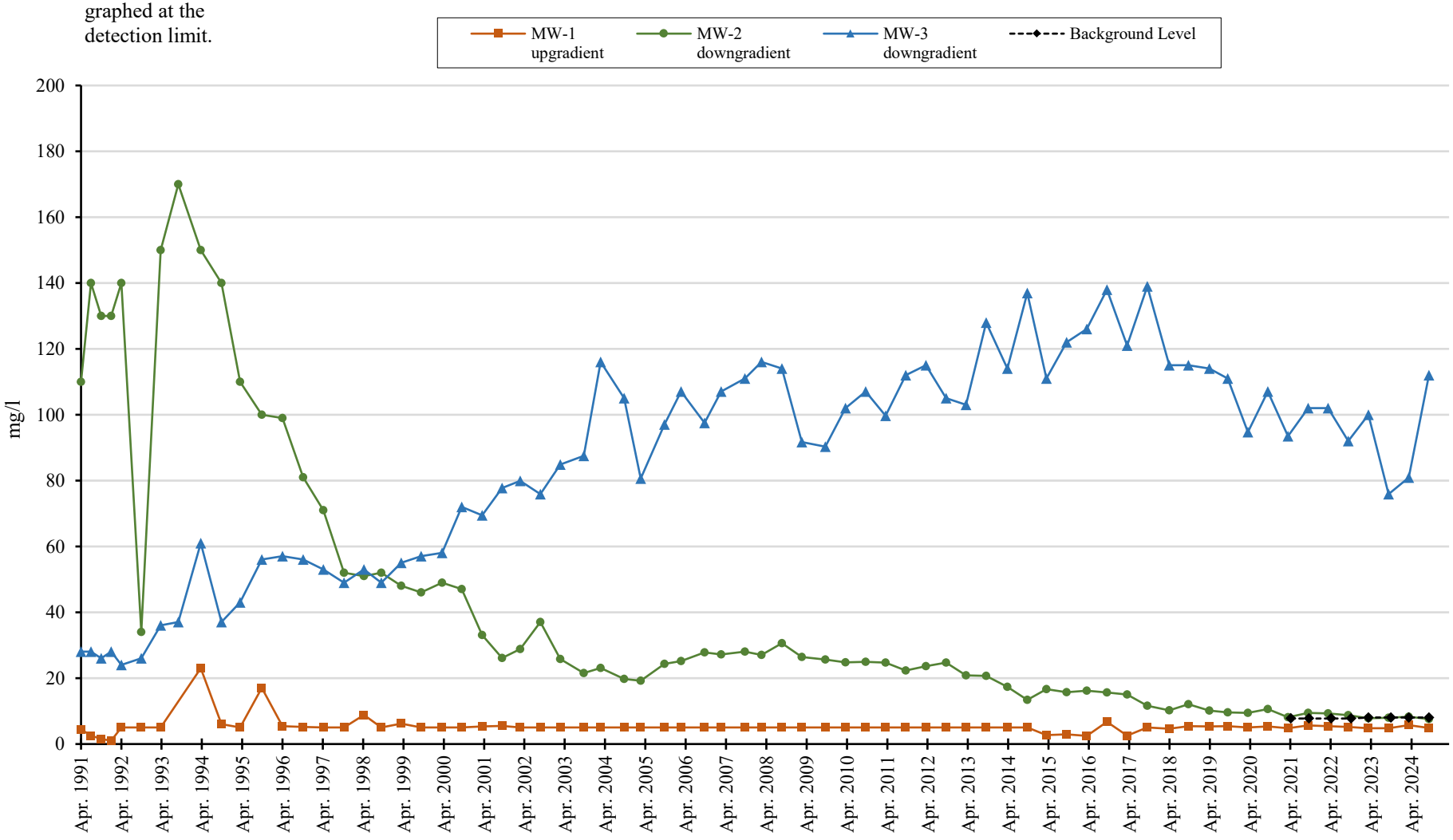
Appendix E: Groundwater Results Graphs

John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Chloride

Nondetect results are graphed at the detection limit.



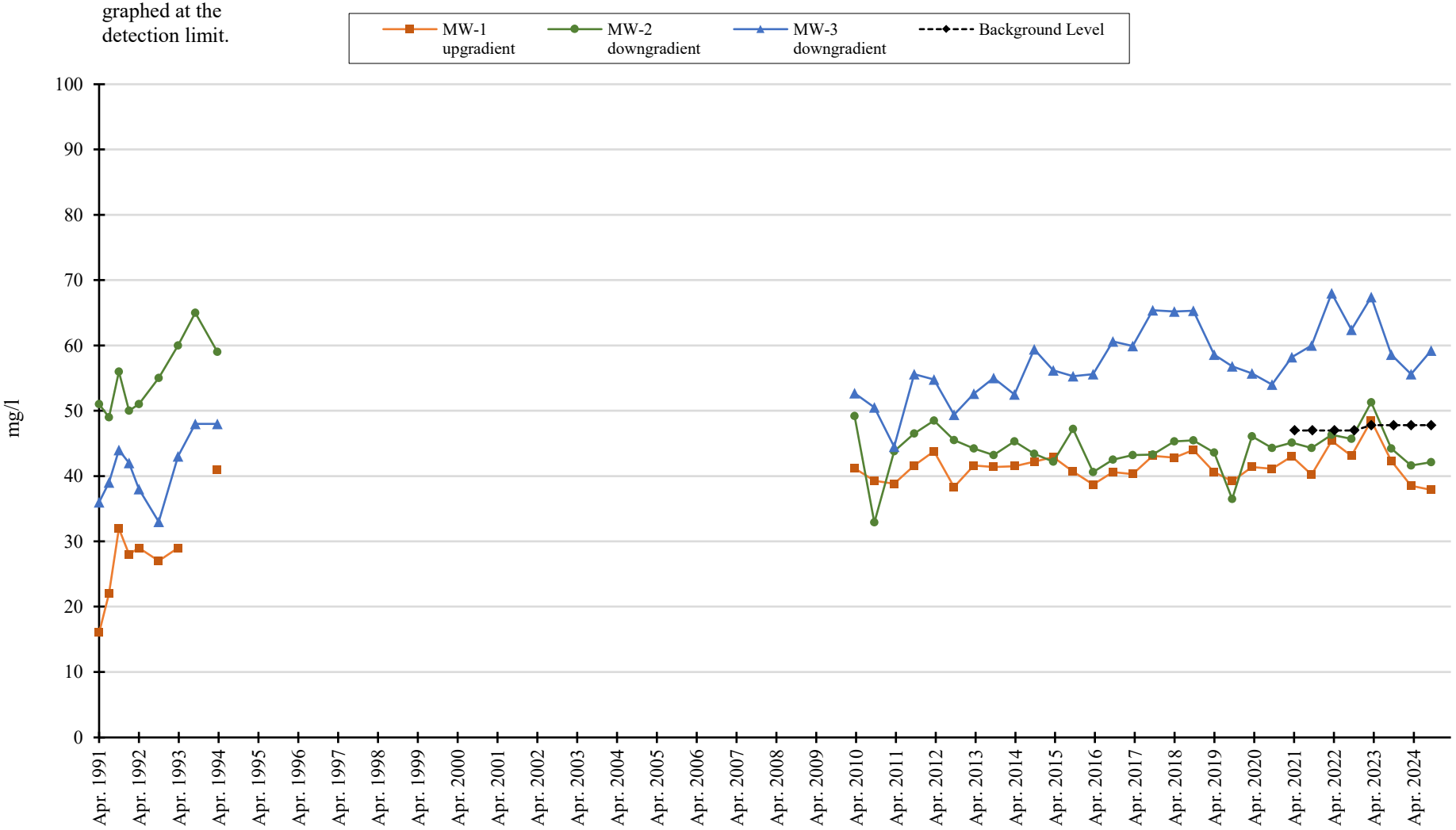
John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Magnesium (Dissolved and Total*)

* Starting in April 2019, the sample results are for <u>total</u> Mg.

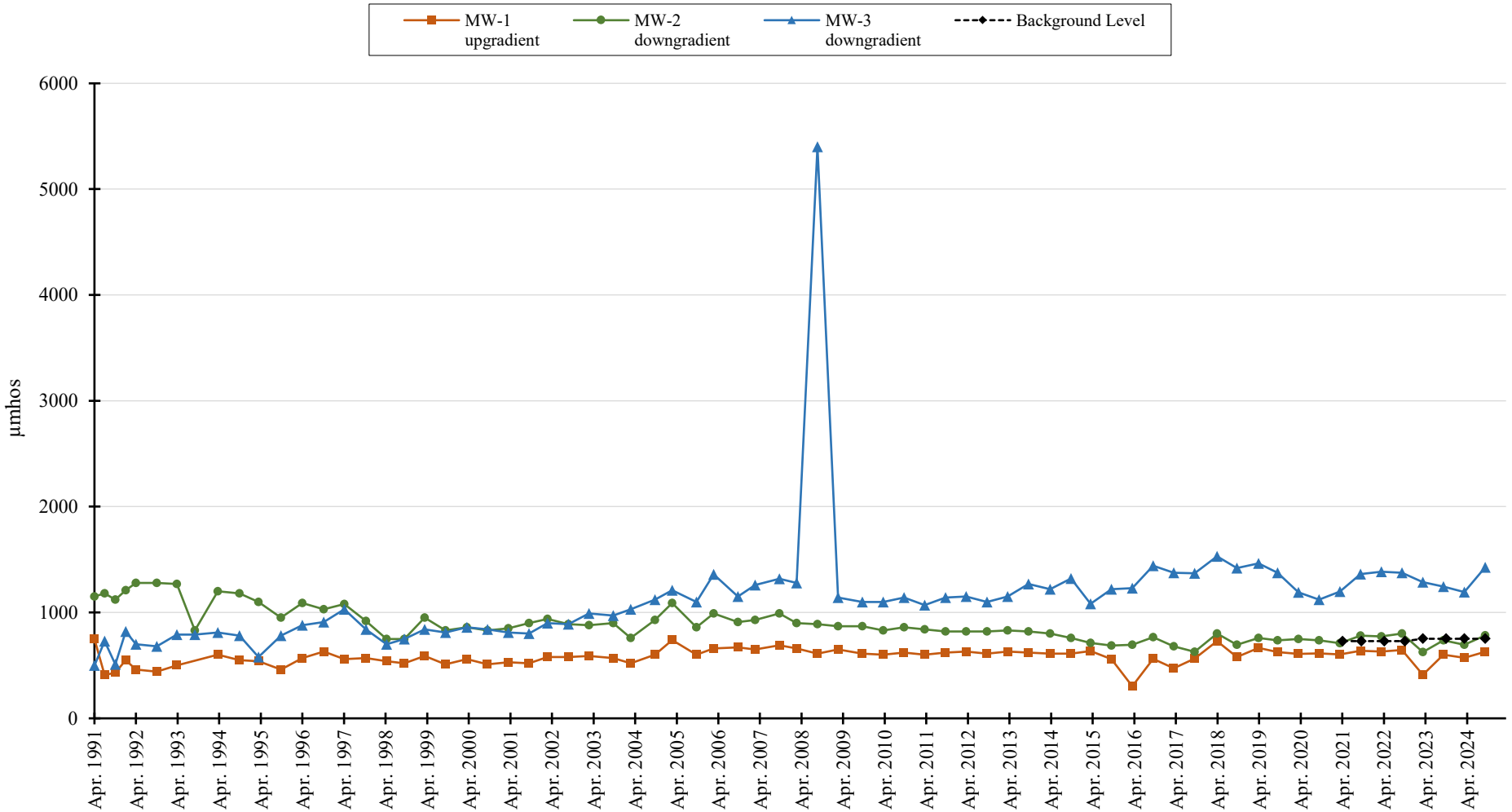
Nondetect results are graphed at the detection limit.



John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Specific Conductance

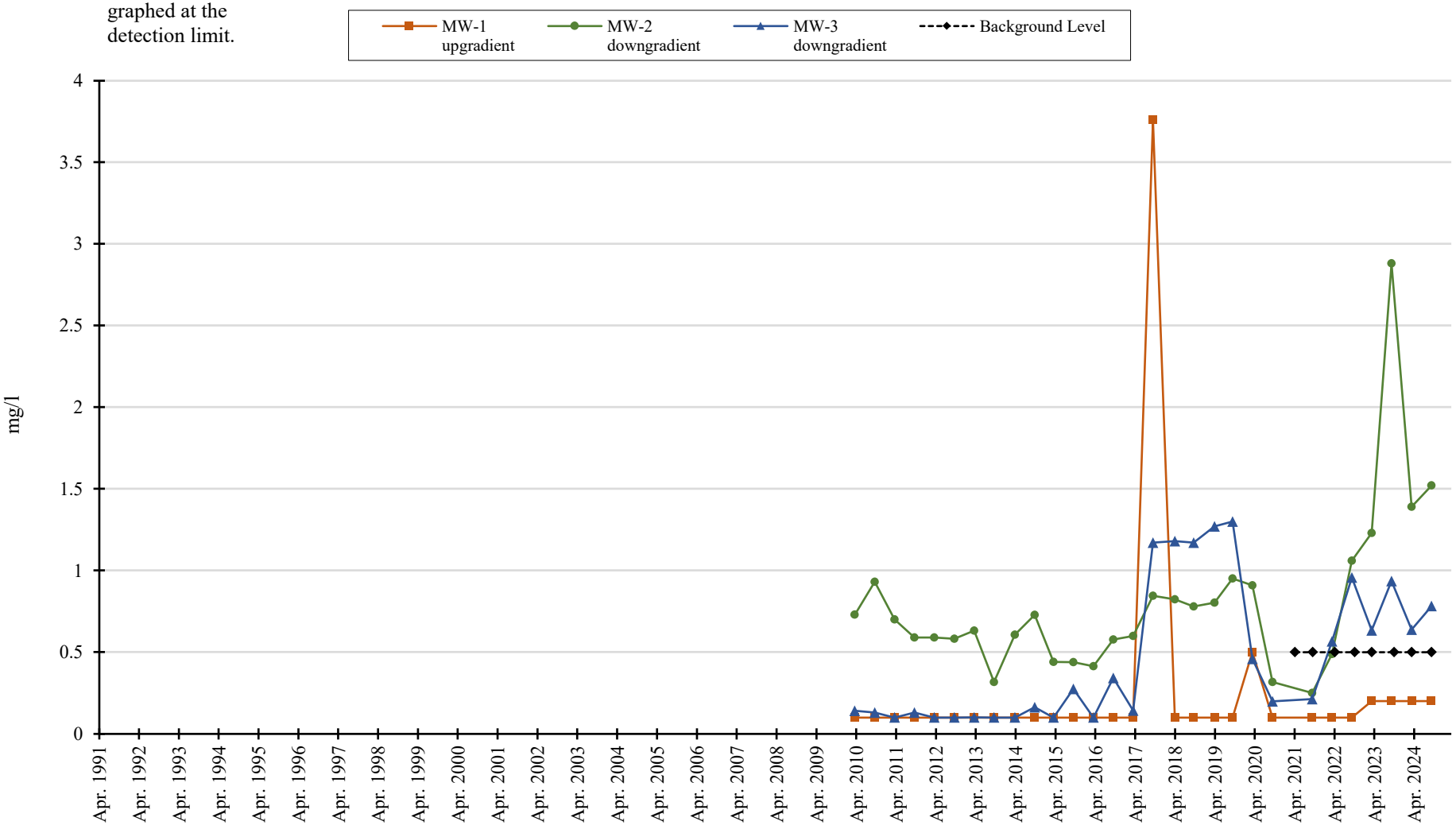


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Nitrates

Nondetect results are graphed at the detection limit.



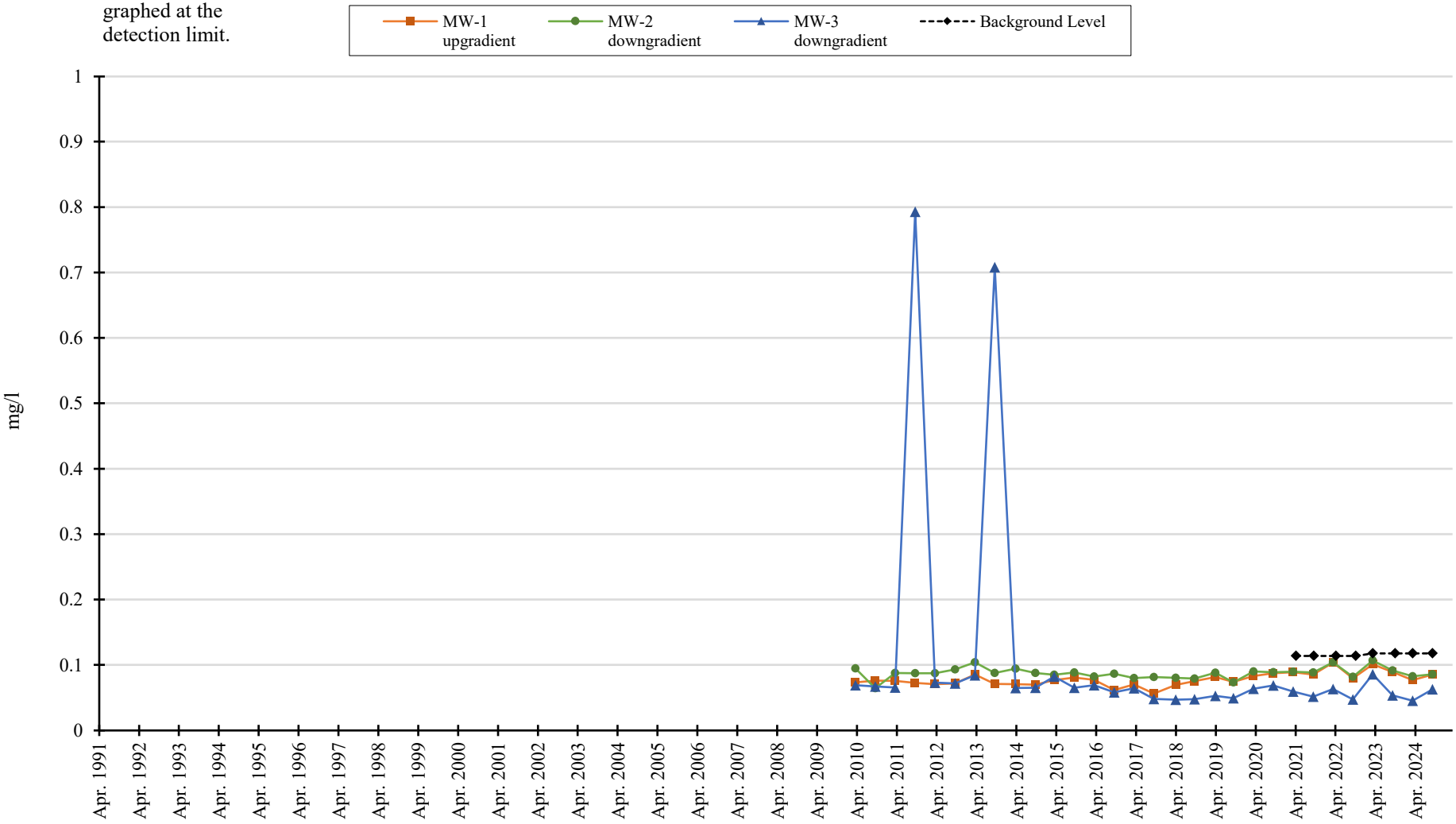
John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Barium (Dissolved and Total*)

* Starting in April 2019, the sample results are for <u>total</u> Ba.

Nondetect results are graphed at the detection limit.

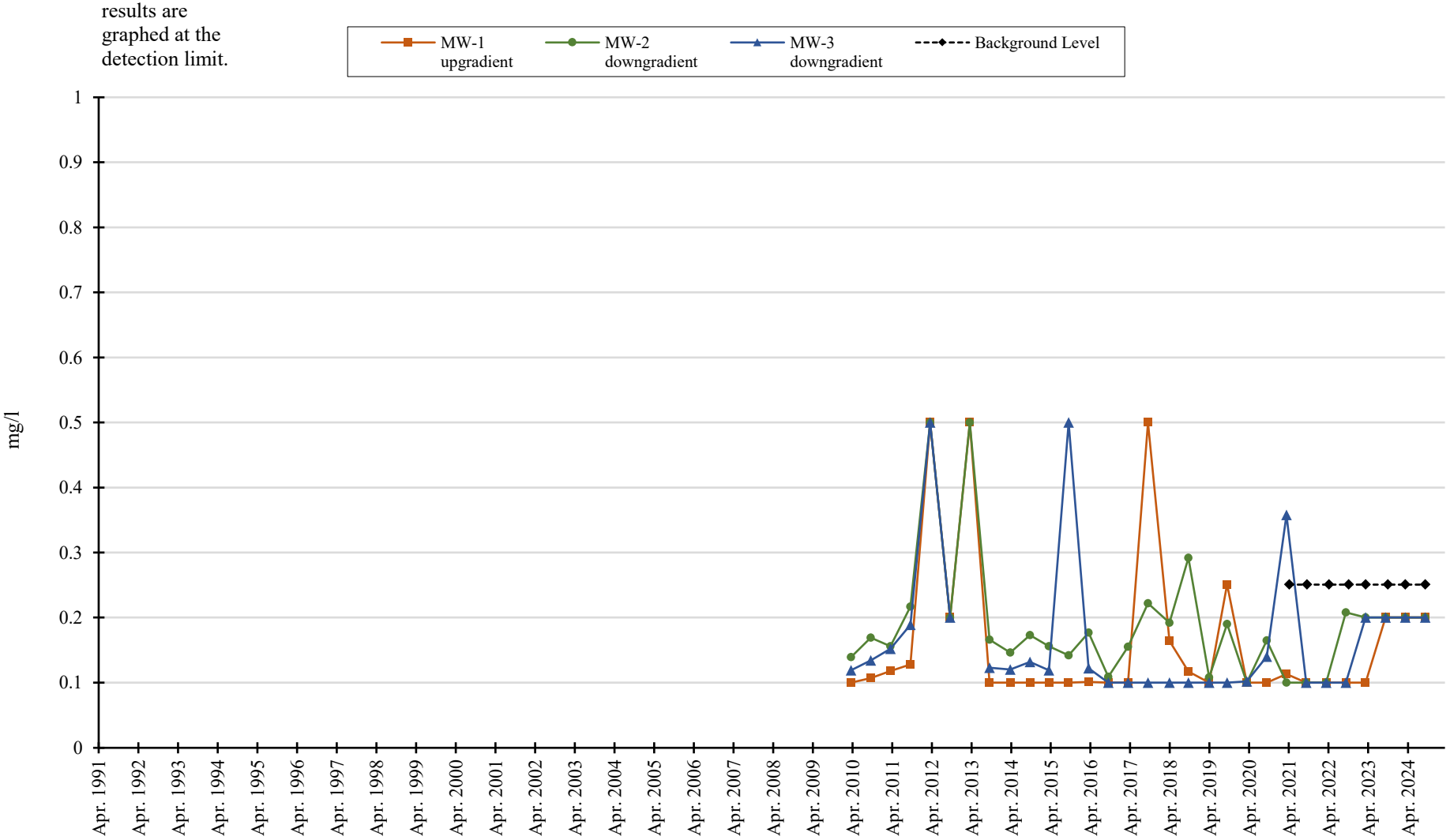


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Fluoride

Nondetect results are graphed at the detection limit.



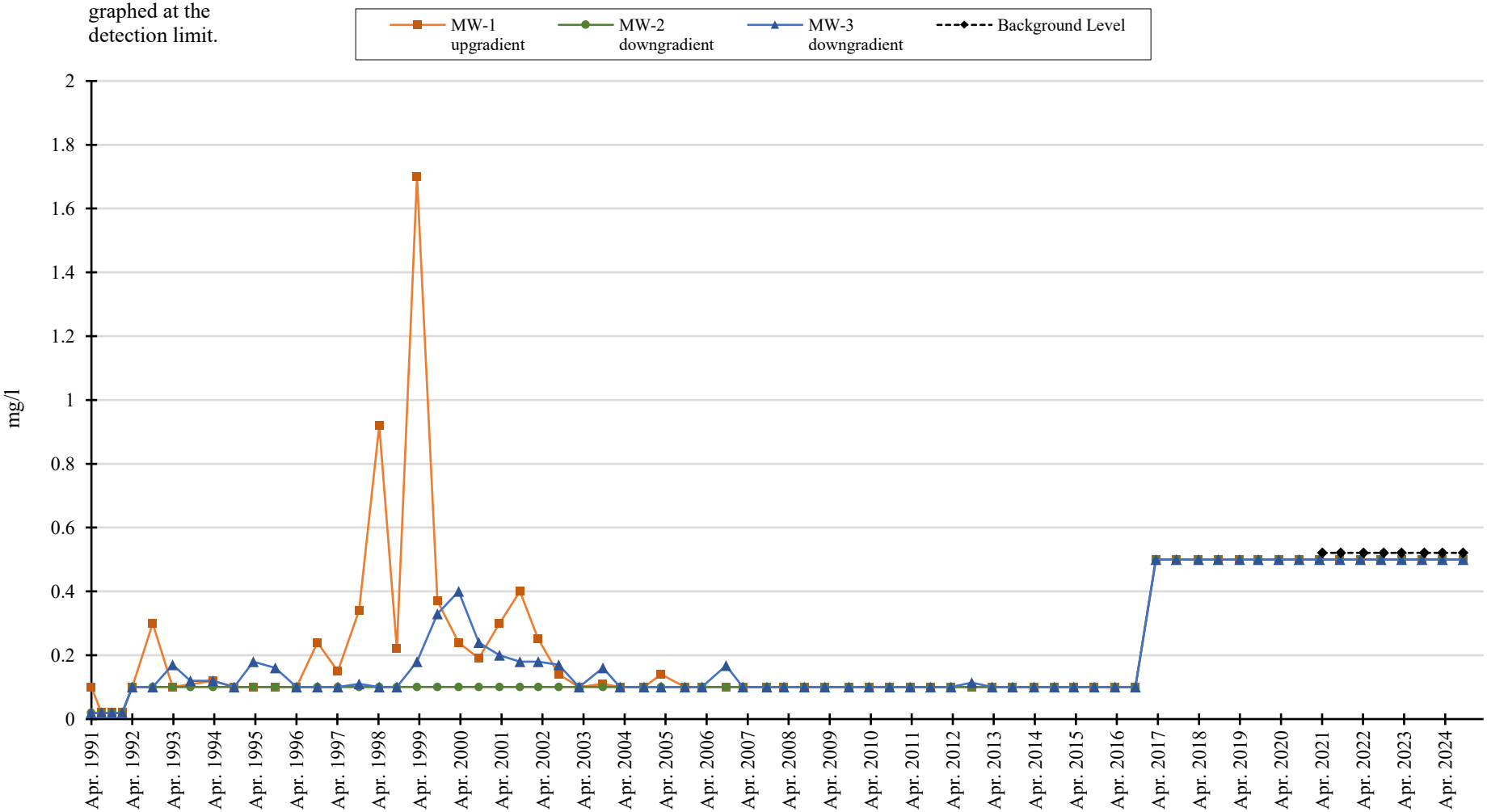
John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Iron (Dissolved and Total*)

* Starting in April 2019, the sample results are for total iron.

Nondetect results are graphed at the detection limit.

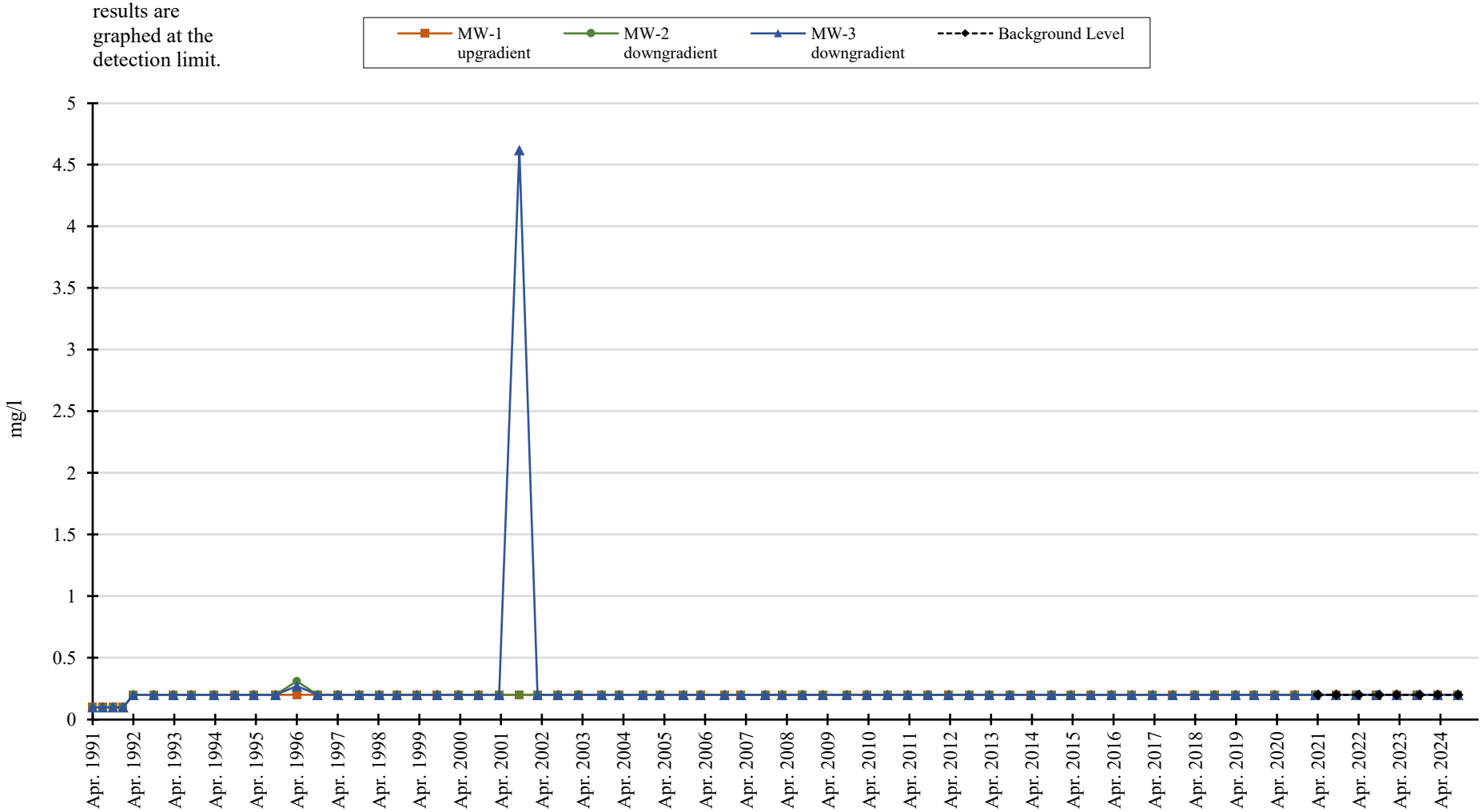


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Ammonia Nitrogen

Nondetect results are graphed at the detection limit.

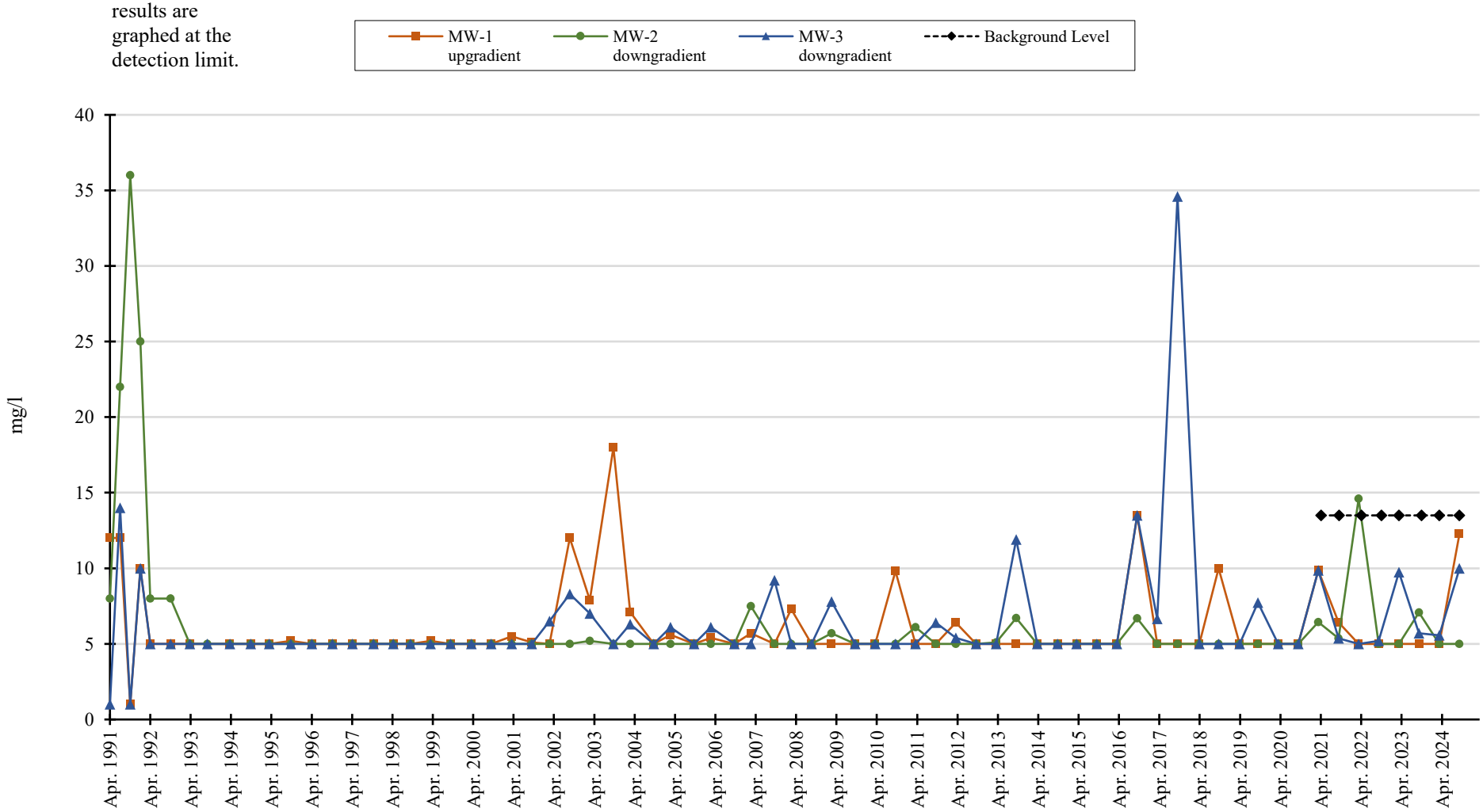


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Chemical Oxygen Demand

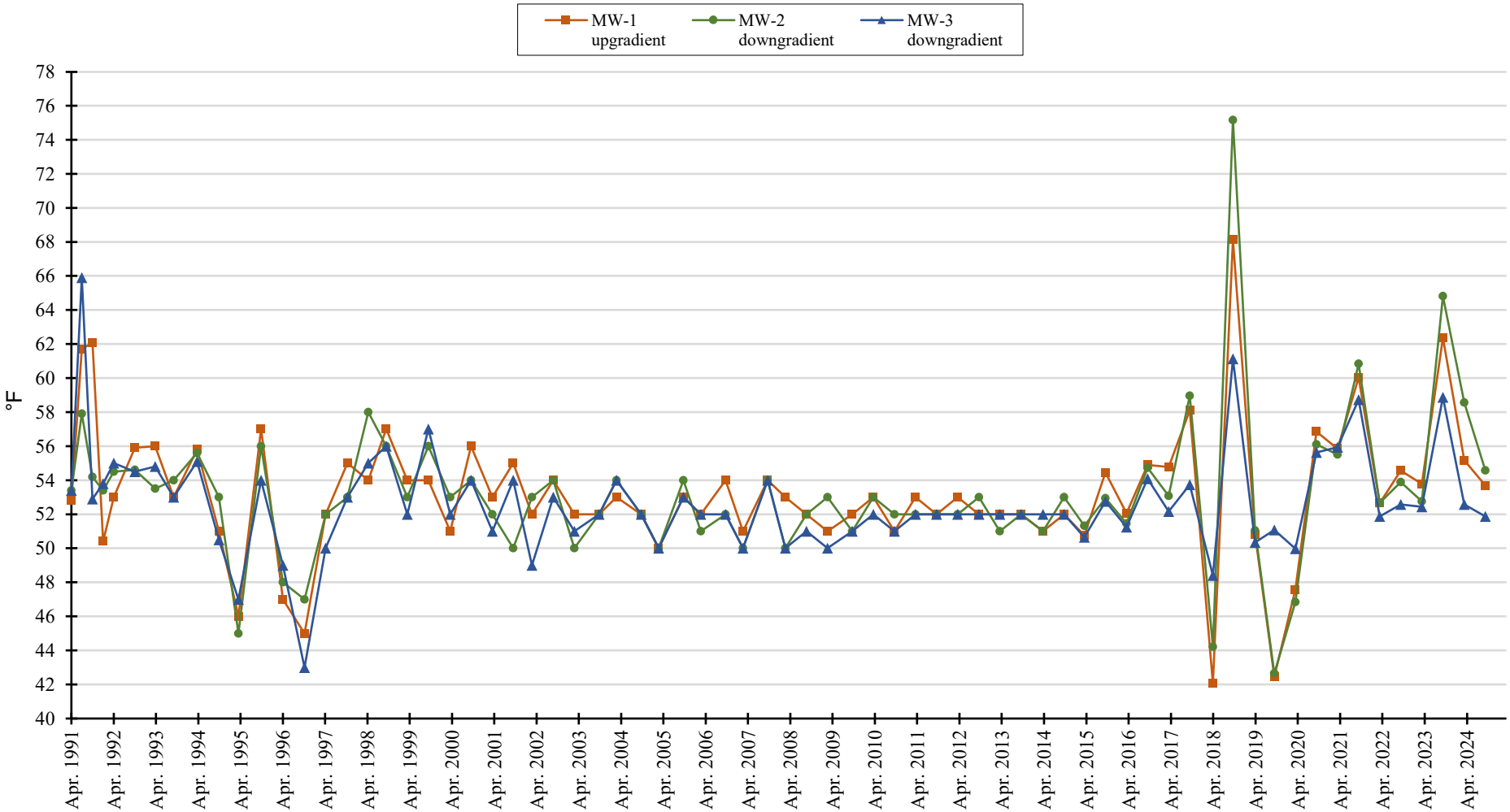
Nondetect results are graphed at the detection limit.



John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

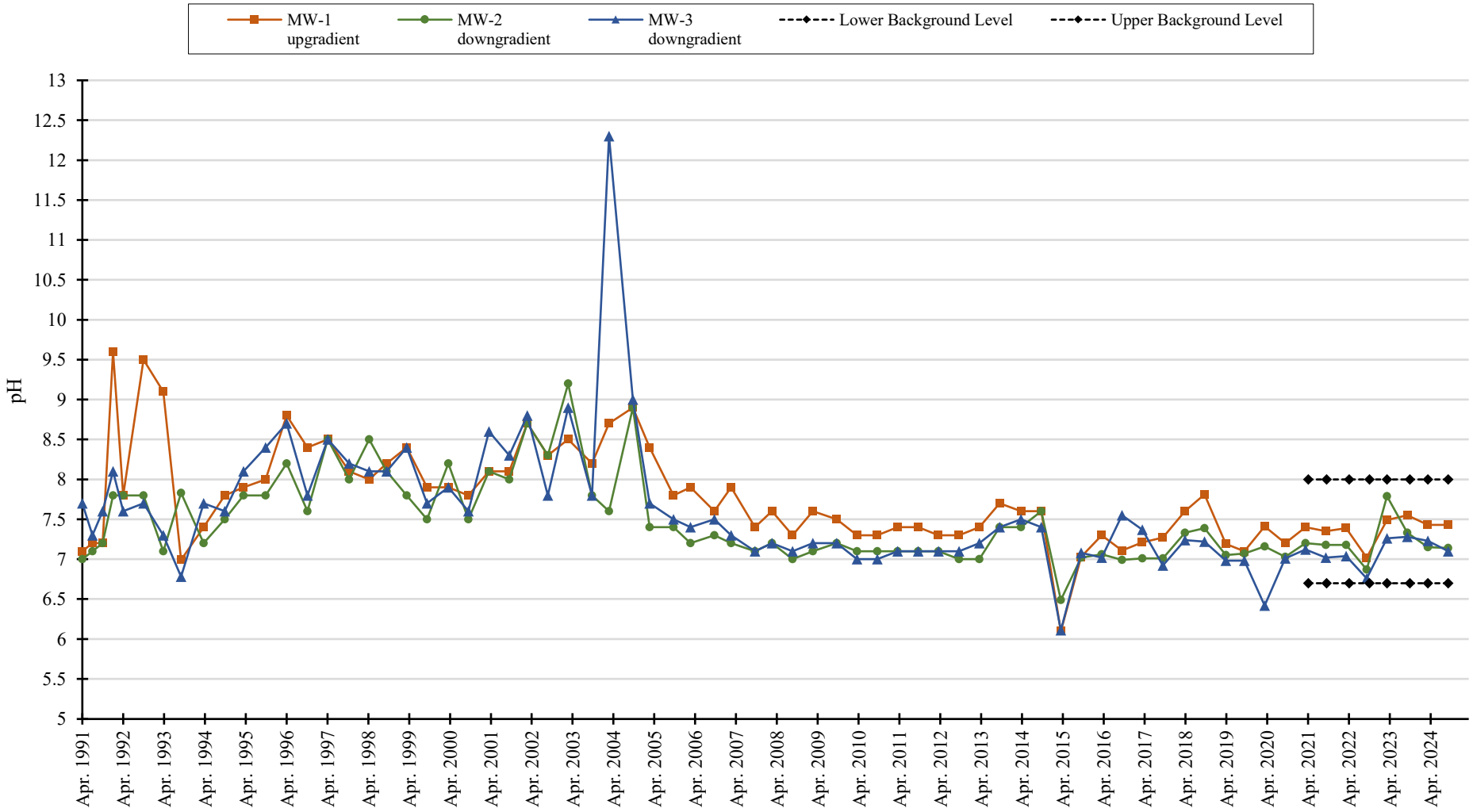
Temperature



John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

pH

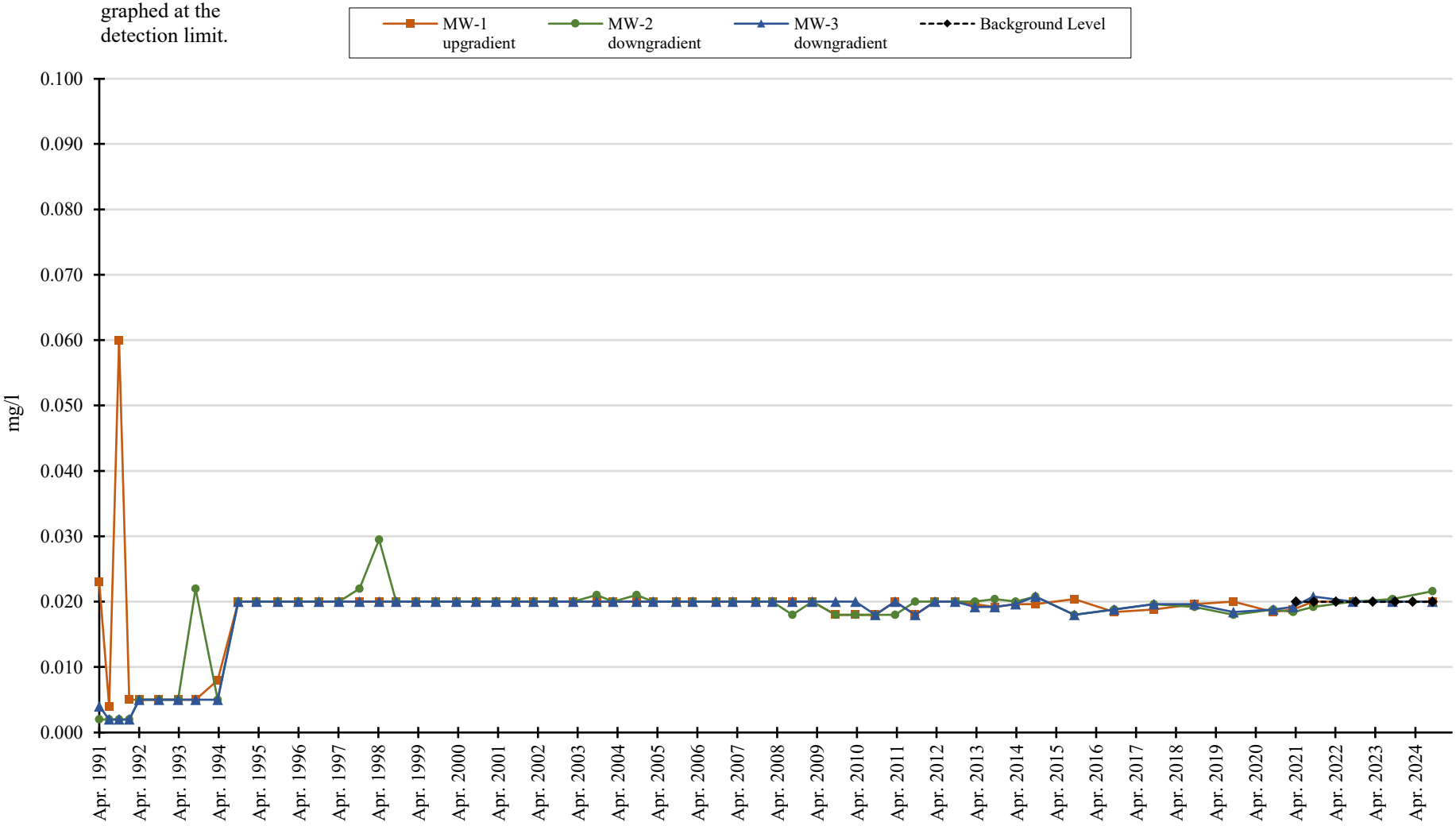


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Phenols

Nondetect results are graphed at the detection limit.

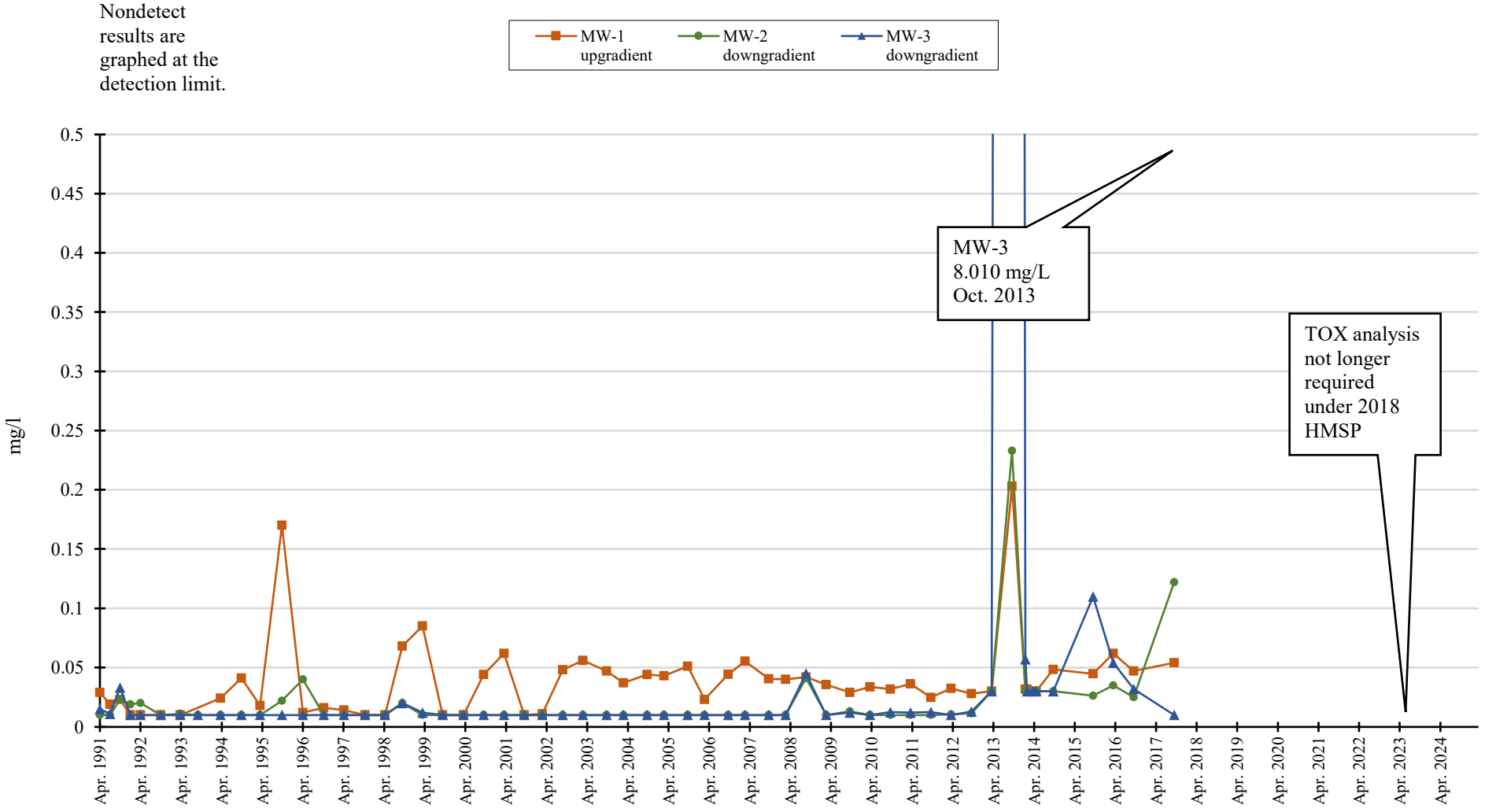


John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring

Total Organic Halogen

Nondetect results are graphed at the detection limit.



Appendix F: Data Validation

- April 2024
- October 2024

Data Validation
April 2024

Memorandum

To: Erica Lawson

From: Megan Yonts (Data Reviewer)
Jessica Esser (Peer Reviewer)

Date: July 2, 2024

Subject: Data Validation Review
Groundwater and Leachate Samples
John Deere, Dubuque Works Landfill
Eurofins-Test America – Cedar Falls, IA
Laboratory Job ID 310-278836-1 (includes Job ID 310-278909-1) – Rev. 1

SUMMARY

Limited validation was performed on the data for four groundwater samples, six leachate samples, and one equipment blank sample collected at the John Deere, Dubuque Works Landfill in Dubuque, Iowa. The samples were collected on April 11-12, 2024 and were submitted to Eurofins-Test America in Cedar Falls, Iowa for analysis. The samples were analyzed for one or more of the following parameters:

- Anions (chloride, fluoride, sulfate, and nitrate) using SW-846 Method 9056A
- Select total metals (barium, boron, calcium, iron, lithium, magnesium, and molybdenum) using SW-846 Method 6010D
- Ammonia using EPA Method 350.1
- Chemical oxygen demand (COD) using Standard Methods (SM) 5220D
- Total dissolved solids (TDS) using SM 2540C

The sample results were assessed using the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review* and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, November 2020. These guidelines were modified to accommodate the method-specific requirements.

In general, the data appear valid as reported and may be used for decision-making purposes. The following issues were noted which may have a minor impact on the data usability:

- The nondetect results for ammonia in samples MW-1, MW-2, MW-3, and Dup-01 were qualified as estimated nondetect (UJ) due to low MS/MSD percent recoveries (%Rs).

SAMPLES

Samples included in this review are listed below:

SDG 310-278836-1 (collected 04/11/2024)

- MW-1
- MW-2
- MW-3
- DUP-01[1]
- EB-01
- S1 Underliner Open
- S1 Leachate Open
- S2 Leachate Open
- Combined Leachate

[1]Field duplicate of MW-2

SDG 310-278909-1 (collected 04/12/2024)

- S1 Underliner Closed
- S2 Underliner Closed

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with chain-of-custody requests
- Data completeness
- Holding times and sample preservation
- Blanks
- Surrogate recoveries
- MS/MSD results
- Laboratory control sample (LCS) results
- Laboratory duplicate results
- Field duplicate results
- Quantitation limits (QLs) and sample results

DISCUSSION

Agreement of Analyses Conducted with Chain-of-Custody (COC) Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. The following issue was noted.

- The COC form requested metals analysis by SW-846 Method 6010C, but this analysis was performed by SW-846 Method 6010D. No validation action was taken on this basis.

Data Completeness

The data packages were found to be complete as received from the laboratory with the following exceptions.

- The laboratory noted iron continuing calibration verification (CCV) nonconformances in the case narrative. No validation actions were taken on this basis since the actual CCV results were not provided for review.

Holding Times and Sample Preservation

All samples were prepared and analyzed within the method-specified holding times. The cooler temperature was within the acceptance criteria (<6°C) upon sample receipt at the laboratory. All samples were properly preserved with the following exception.

- The nitric acid preserved container for the metals analysis of sample S1 Leachate Open was received with a pH outside of the method requited criteria (>2) and was preserved by the laboratory to the appropriate pH (<2). No validation action was required on this basis.

Blanks

There were no analytes detected in the laboratory method blanks or the equipment blank (EB-01).

The laboratory did not provide method blank results for the following analyses: the 20-fold diluted analysis of sulfate in samples S2 Leachate Open and Combined Leachate; the undiluted analysis of chloride, nitrate, fluoride, and sulfate in sample S1 Underline Closed; the undiluted analysis of nitrate and fluoride in sample S2 Underliner Closed; and the 5-fold diluted analysis of chloride in sample S2 Underliner Closed. The method blank from the original analysis that was performed >24 hours prior to these analyses was used to evaluate for potential method blank contamination. No validation action was taken on this basis.

Surrogate Recoveries

Surrogate recoveries are not applicable for this data set.

MS/MSD Results

MS/MSD analyses were performed on sample EB-01 for anions and sample MW-1 for ammonia. Note that MS/MSD analyses on an equipment blank sample are not relevant to the site media; therefore, the results were not included in this review. The %Rs and relative percent differences (RPDs) met the laboratory acceptance criteria with the following exceptions.

Sample ID	Analyte	MS %R	MSD %R	RPD	%R/RPD QC Limits	Validation Action
MW-1	Ammonia	84	82	-	90-110	The nondetect results for Ammonia were qualified as estimated (UJ) in the associated samples due to low MS and MSD recoveries.
Associated Samples: MW-1, MW-2, MW-3, Dup-01 - met criteria						

LCS Results

The LCS %Rs met the laboratory acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analysis was performed on sample S1 Underliner Open. The RPDs met the laboratory acceptance criteria.

Field Duplicate Results

Samples MW-2/DUP-1 were submitted as the field duplicate pair. The following table summarizes the RPDs and absolute difference (AbsD), where applicable, of the detected analytes in the field duplicate pair and the validation actions.

Analyte	QL (mg/L)	MW-2 (mg/L)	DUP-1 (mg/L)	RPD (%) or AbsD (mg/L)	Validation Actions
Chloride	1.00	8.30	8.26	RPD = 0.5	None; all criteria were met
Nitrate as N	1.00	1.39	1.41	AbsD = 0.02	
Sulfate	1.00	20.9	19.1	RPD = 9.0	
Barium	0.0100	0.0825	0.0780	RPD = 5.6	
Calcium	1.00	97.6	92.7	RPD = 5.1	
Magnesium	1.00	41.6	39.5	RPD = 5.2	
TDS	50.0	418	398	RPD = 4.9	
Criteria: When both results are ≥ 5x the QL, RPDs must be ≤30%. When one or both results are <5x the QL, AbsD must be ≤QL.					

Quantitation Limits and Sample Results

Based on historical data values, a request was made for the laboratory to investigate the reported results for chloride, fluoride, and nitrate in sample MW-3. In that investigation, the laboratory discovered that the chloride and fluoride results had been switched, and that nitrate was detected when reported from the undiluted analysis. The laboratory report and validation report were revised accordingly.

The table below summarizes the samples that were analyzed on dilution. The QLs for these samples were elevated accordingly, but all affected analytes were detected; therefore there was not an adverse impact on the usability of the data.

Sample IDs	Parameter	Dilution	Reason for Dilution
S1 Leachate Open	Chloride	5-fold	A dilution was likely performed due to the concentrations of chloride which would have exceeded the calibration range if analyzed undiluted.
S2 Leachate Open			
Combined Leachate			
S2 Underliner Closed			
MW-2	Nitrate		A reason for dilution was not provided but likely due to concentrations of interfering analytes (e.g., chloride, sulfate)
Dup-01			
S1 Underliner Open			
MW-3	Sulfate		A dilution was likely performed due to the concentrations of sulfate which would have exceeded the calibration range if analyzed undiluted.
S2 Leachate Open		20-fold	
Combined Leachate			
S2 Underliner Closed		50-fold	
S1 Underliner Closed	COD	5-fold	A dilution was likely performed due to the nature of the sample matrix.
S2 Underliner Closed			

It should be noted that the TDS analyses of samples S2 Leachate Open, Combined Leachate, and S2 Underliner Closed were likely performed with reduced volumes as the QLs were 5x higher than other samples. Since TDS was detected in these samples, there was no adverse impact to the data.

It should be noted that the RLs for ammonia were 0.5 mg/L in leachate samples and 0.2 mg/L in groundwater samples due to the use of different preparation methods for each matrix. Additionally, it should be noted that the preparation of the ammonia analysis for sample S2 Leachate Open was likely performed with reduced volume as the QL for this sample was 5x higher than the other leachate samples. Since ammonia was detected in this sample, there was no adverse impact to the data.

QUALIFIED FORM 1s

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-1

Date Collected: 04/11/24 12:20
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**5.68**		1.00		mg/L			04/12/24 15:38	1
Nitrate as N	<0.200		0.200		mg/L			04/12/24 15:38	1
Fluoride	<0.200		0.200		mg/L			04/12/24 15:38	1
Sulfate	**25.7**		1.00		mg/L			04/12/24 15:38	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0770**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:07	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:07	1
Calcium	**67.2**		1.00		mg/L		04/17/24 09:00	04/17/24 18:07	1
Iron	<0.500	~~J1~~	0.500		mg/L		04/17/24 09:00	04/17/24 18:07	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:07	1
Magnesium	**38.5**		1.00		mg/L		04/17/24 09:00	04/17/24 18:07	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200	~~F1~~ UJ	0.200		mg/L			04/16/24 17:40	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**360**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-2

Date Collected: 04/11/24 13:33
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**8.30**		1.00		mg/L			04/12/24 15:51	1
Nitrate as N	**1.39**		1.00		mg/L			04/12/24 19:25	5
Fluoride	<0.200		0.200		mg/L			04/12/24 15:51	1
Sulfate	**20.9**		1.00		mg/L			04/12/24 15:51	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0825**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:09	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:09	1
Calcium	**97.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:09	1
Iron	<0.500	~~J+~~	0.500		mg/L		04/17/24 09:00	04/17/24 18:09	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:09	1
Magnesium	**41.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:09	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200	UJ	0.200		mg/L			04/16/24 17:42	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**418**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: MW-3

Date Collected: 04/11/24 10:37
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**80.9**		1.00		mg/L			04/12/24 13:07	1
Nitrate as N	**0.638**		0.200		mg/L			04/12/24 13:07	1
Fluoride	<0.200		0.200		mg/L			04/12/24 13:07	1
Sulfate	**126**		5.00		mg/L			04/12/24 13:20	5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0455**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:11	1
Boron	**2.26**		0.200		mg/L		04/17/24 09:00	04/17/24 18:11	1
Calcium	**122**		1.00		mg/L		04/17/24 09:00	04/17/24 18:11	1
Iron	<0.500	~~UL~~	0.500		mg/L		04/17/24 09:00	04/17/24 18:11	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:11	1
Magnesium	**55.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:11	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200	UJ	0.200		mg/L			04/16/24 17:43	1
Chemical Oxygen Demand (SM 5220D LL)	**5.56**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**734**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Dup-01

Date Collected: 04/11/24 00:00
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**8.26**		1.00		mg/L			04/12/24 12:42	1
Nitrate as N	**1.41**		1.00		mg/L			04/12/24 12:55	5
Fluoride	<0.200		0.200		mg/L			04/12/24 12:42	1
Sulfate	**19.1**		1.00		mg/L			04/12/24 12:42	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0780**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:13	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:13	1
Calcium	**92.7**		1.00		mg/L		04/17/24 09:00	04/17/24 18:13	1
Iron	<0.500	~~^+~~	0.500		mg/L		04/17/24 09:00	04/17/24 18:13	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:13	1
Magnesium	**39.5**		1.00		mg/L		04/17/24 09:00	04/17/24 18:13	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200	UJ	0.200		mg/L			04/16/24 17:43	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**398**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: EB-01

Date Collected: 04/11/24 13:55
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/12/24 16:03	1
Nitrate as N	<0.200		0.200		mg/L			04/12/24 16:03	1
Fluoride	<0.200		0.200		mg/L			04/12/24 16:03	1
Sulfate	<1.00		1.00		mg/L			04/12/24 16:03	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		04/17/24 09:00	04/17/24 18:15	1
Boron	<0.200		0.200		mg/L		04/17/24 09:00	04/17/24 18:15	1
Calcium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 18:15	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:15	1
Lithium	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:15	1
Magnesium	<1.00		1.00		mg/L		04/17/24 09:00	04/17/24 18:15	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			04/16/24 17:45	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Underliner Open

Lab Sample ID: 310-278836-6

Date Collected: 04/11/24 10:40
Date Received: 04/12/24 09:30

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**80.9**		1.00		mg/L			04/12/24 13:33	1
Nitrate as N	**2.97**		1.00		mg/L			04/12/24 14:10	5
Fluoride	**0.311**		0.200		mg/L			04/12/24 13:33	1
Sulfate	**26.7**		1.00		mg/L			04/12/24 13:33	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.696**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:17	1
Boron	**3.01**		0.200		mg/L		04/17/24 09:00	04/17/24 18:17	1
Calcium	**86.8**		1.00		mg/L		04/17/24 09:00	04/17/24 18:17	1
Iron	<0.500	^+	0.500		mg/L		04/17/24 09:00	04/17/24 18:17	1
Lithium	**0.0679**		0.0500		mg/L		04/17/24 09:00	04/17/24 18:17	1
Magnesium	**42.6**		1.00		mg/L		04/17/24 09:00	04/17/24 18:17	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		04/18/24 08:35	04/19/24 09:15	1
Chemical Oxygen Demand (SM 5220D LL)	**17.7**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**706**		50.0		mg/L			04/15/24 18:54	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Leachate Open

Date Collected: 04/11/24 11:00
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**115**		5.00		mg/L			04/12/24 14:35	5
Nitrate as N	<0.200		0.200		mg/L			04/12/24 14:23	1
Fluoride	**0.443**		0.200		mg/L			04/12/24 14:23	1
Sulfate	**2.53**		1.00		mg/L			04/12/24 14:23	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.869**		0.0100		mg/L		04/17/24 09:00	04/17/24 18:21	1
Boron	**8.19**		0.200		mg/L		04/17/24 09:00	04/17/24 18:21	1
Calcium	**115**		1.00		mg/L		04/17/24 09:00	04/17/24 18:21	1
Iron	**8.66**		0.500		mg/L		04/17/24 09:00	04/19/24 10:59	1
Lithium	**0.210**		0.0500		mg/L		04/17/24 09:00	04/17/24 18:21	1
Magnesium	**44.8**		1.00		mg/L		04/17/24 09:00	04/17/24 18:21	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**4.98**		0.500		mg/L		04/18/24 08:35	04/19/24 09:17	1
Chemical Oxygen Demand (SM 5220D LL)	**27.4**		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	**952**		50.0		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Leachate Open

Date Collected: 04/11/24 11:05
Date Received: 04/12/24 09:30

Lab Sample ID: 310-278836-8
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	134		5.00		mg/L			04/12/24 15:00	5
Nitrate as N	<0.200		0.200		mg/L			04/12/24 14:48	1
Fluoride	0.829		0.200		mg/L			04/12/24 14:48	1
Sulfate	1190		20.0		mg/L			04/13/24 13:15	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0268		0.0100		mg/L		04/17/24 09:00	04/17/24 18:27	1
Boron	22.1		0.200		mg/L		04/17/24 09:00	04/17/24 18:27	1
Calcium	159		1.00		mg/L		04/17/24 09:00	04/17/24 18:27	1
Iron	2.88		0.500		mg/L		04/17/24 09:00	04/19/24 11:01	1
Lithium	1.14		0.0500		mg/L		04/17/24 09:00	04/17/24 18:27	1
Magnesium	126		1.00		mg/L		04/17/24 09:00	04/17/24 18:27	1
Molybdenum	0.0565		0.0500		mg/L		04/17/24 09:00	04/17/24 18:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	9.79		2.50		mg/L		04/18/24 08:35	04/19/24 09:17	1
Chemical Oxygen Demand (SM 5220D LL)	68.9		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	2510		250		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: Combined Leachate

Lab Sample ID: 310-278836-9

Date Collected: 04/11/24 11:10

Matrix: Water

Date Received: 04/12/24 09:30

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	119		5.00		mg/L			04/12/24 15:26	5
Nitrate as N	0.865		0.200		mg/L			04/12/24 15:13	1
Fluoride	0.677		0.200		mg/L			04/12/24 15:13	1
Sulfate	715		20.0		mg/L			04/13/24 13:28	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.211		0.0100		mg/L		04/17/24 09:00	04/17/24 18:29	1
Boron	15.2		0.200		mg/L		04/17/24 09:00	04/17/24 18:29	1
Calcium	134		1.00		mg/L		04/17/24 09:00	04/17/24 18:29	1
Iron	2.17		0.500		mg/L		04/17/24 09:00	04/19/24 11:03	1
Lithium	0.695		0.0500		mg/L		04/17/24 09:00	04/17/24 18:29	1
Magnesium	88.3		1.00		mg/L		04/17/24 09:00	04/17/24 18:29	1
Molybdenum	<0.0500		0.0500		mg/L		04/17/24 09:00	04/17/24 18:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	5.94		0.500		mg/L		04/23/24 11:30	04/23/24 22:23	1
Chemical Oxygen Demand (SM 5220D LL)	45.0		5.00		mg/L			04/18/24 14:24	1
Total Dissolved Solids (SM 2540C)	2010		250		mg/L			04/15/24 18:54	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S1 Underliner Closed

Date Collected: 04/12/24 11:30
Date Received: 04/13/24 09:00

Lab Sample ID: 310-278909-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**85.7**		1.00		mg/L			04/13/24 13:40	1
Nitrate as N	**1.77**		0.200		mg/L			04/13/24 13:40	1
Fluoride	**0.302**		0.200		mg/L			04/13/24 13:40	1
Sulfate	**42.8**		1.00		mg/L			04/13/24 13:40	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.496**		0.0100		mg/L		04/15/24 15:46	04/17/24 10:46	1
Boron	**3.87**		0.200		mg/L		04/15/24 15:46	04/17/24 10:46	1
Calcium	**71.1**		1.00		mg/L		04/15/24 15:46	04/17/24 10:46	1
Iron	<0.500		0.500		mg/L		04/15/24 15:46	04/17/24 10:46	1
Lithium	**0.0970**		0.0500		mg/L		04/15/24 15:46	04/17/24 10:46	1
Magnesium	**41.4**		1.00		mg/L		04/15/24 15:46	04/17/24 10:46	1
Molybdenum	<0.0500		0.0500		mg/L		04/15/24 15:46	04/17/24 10:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		04/23/24 08:34	04/23/24 20:42	1
Chemical Oxygen Demand (SM 5220D LL)	**28.3**		25.0		mg/L			04/23/24 09:39	5
Total Dissolved Solids (SM 2540C)	**700**		50.0		mg/L			04/16/24 17:30	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill

Job ID: 310-278836-1

Client Sample ID: S2 Underliner Closed

Date Collected: 04/12/24 11:24
Date Received: 04/13/24 09:00

Lab Sample ID: 310-278909-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	132		5.00		mg/L			04/13/24 14:09	5
Nitrate as N	<0.200		0.200		mg/L			04/13/24 13:53	1
Fluoride	0.701		0.200		mg/L			04/13/24 13:53	1
Sulfate	1170		50.0		mg/L			04/17/24 10:26	50

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0321		0.0100		mg/L		04/15/24 15:47	04/17/24 10:48	1
Boron	22.1		0.200		mg/L		04/15/24 15:47	04/17/24 10:48	1
Calcium	166		1.00		mg/L		04/15/24 15:47	04/17/24 10:48	1
Iron	2.58		0.500		mg/L		04/15/24 15:47	04/17/24 10:48	1
Lithium	1.13		0.0500		mg/L		04/15/24 15:47	04/17/24 10:48	1
Magnesium	126		1.00		mg/L		04/15/24 15:47	04/17/24 10:48	1
Molybdenum	0.0522		0.0500		mg/L		04/15/24 15:47	04/17/24 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.63		0.500		mg/L		04/23/24 08:34	04/23/24 20:44	1
Chemical Oxygen Demand (SM 5220D LL)	74.9		25.0		mg/L			04/23/24 09:39	5
Total Dissolved Solids (SM 2540C)	2160		250		mg/L			04/16/24 17:30	1

Data Validation
October 2024

Memorandum

To: Erica Lawson

From: Nancy Bergstrom (Data Reviewer)
Jessica Esser (Peer Reviewer)

Date: November 20, 2024

Subject: Data Validation Review
Groundwater and Leachate Samples
John Deere, Dubuque Works Landfill
Eurofins Environment Testing – Cedar Falls, IA
Laboratory Job Number 310-293885-1 (includes Job Number 310-293962-1)-Rev.1

SUMMARY

Limited validation was performed on the data for four groundwater samples, six leachate samples, and one equipment blank sample collected at the John Deere, Dubuque Works Landfill in Dubuque, Iowa. The samples were collected on October 28-29, 2024 and were submitted to Eurofins Environment Testing in Cedar Falls, Iowa for analysis. The samples were analyzed for the following parameters:

- Anions (chloride, fluoride, sulfate, and nitrate) using SW-846 Method 9056A
- Select total metals (barium, boron, calcium, iron, lithium, magnesium, and molybdenum) using SW-846 Method 6010D
- Ammonia using EPA Method 350.1
- Chemical oxygen demand (COD) using Standard Methods (SM) 5220D
- Total dissolved solids (TDS) using SM 2540C
- Total Phenols using SW-846 Method 9066

The sample results were assessed in accordance with *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-542-R-20-006)*, November 2020. These guidelines were modified to accommodate the method-specific requirements.

In general, the data appear valid as reported and may be used for decision-making purposes.

SAMPLES

Samples included in this review are listed below:

Sample Delivery Group (SDG) 310-293885-1 (collected 10/28/2024)

- MW-1
- MW-2
- MW-3
- DUP-01[1]
- EB-01
- S1 Underliner Open
- S1 Leachate Open
- S2 Leachate Open
- Combined Leachate

[1]Field duplicate of MW-2

SDG 310-293962-1 (collected 10/29/2024)

- S1 Underliner Closed
- S2 Underliner Closed

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with chain-of-custody requests
- Data completeness
- Holding times and sample preservation
- Blanks
- MS/MSD results
- Laboratory control sample (LCS) results
- Laboratory duplicate results
- Field duplicate results
- Quantitation limits (QLs) and sample results

DISCUSSION

Agreement of Analyses Conducted with Chain-of-Custody (COC) Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. The following issue was noted.

- The COC form for the samples collected 10/28/2024 did not request analysis of total dissolved solids (TDS), but this analysis was performed on all samples. No validation action was taken on this basis.

Data Completeness

The data package was found to be complete as received from the laboratory with the following exception.

- The COC for Job Number 310-293962-1 was not included with the original lab report. The laboratory was contacted and provided a revised report to include the COC.

Holding Times and Sample Preservation

All holding time and sample preservation criteria were met with the following note.

- The laboratory flagged the nitrate result for sample DUP-01 with an “H”, indicating the sample was analyzed beyond the specified holding time. A collection time was not provided on the COC for sample DUP-01. The collection time was assumed to be near the time of the parent sample (MW-2), therefore sample DUP-01 was analyzed for nitrate within the required holding time and the result was not qualified.

Blanks

There were no analytes detected in the laboratory method blanks or the equipment blank (EB-01).

MS/MSD Results

MS/MSD analyses were performed on sample MW-3 for metals, sample MW-2 for ammonia, sample DUP-01 for COD, and sample S1 Leachate Open for total phenols. The percent recoveries (%Rs) and relative percent differences (RPDs) met the laboratory acceptance criteria.

Laboratory Duplicate Results

A laboratory duplicate analysis was performed on sample S2 Leachate Open for TDS. The RPD met the laboratory acceptance criteria.

LCS Results

The LCS %Rs met the laboratory acceptance criteria.

Field Duplicate Results

Samples MW-2/DUP-01 were submitted as the field duplicate pair. The following table summarizes the RPDs of the detected analytes in the field duplicate pair and the validation actions.

Analyte	QL (mg/L)	MW-2 (mg/L)	DUP-1 (mg/L)	RPD (%)	Validation Actions
Chloride	1.00	7.58	7.50	RPD = 1.06	None; all criteria were met
Nitrate as N	0.200	1.52	1.53	RPD = 0.656	
Sulfate	1.00	19.9	19.6	RPD = 1.52	
Barium	0.0100	0.0857	0.0867	RPD = 1.16	
Calcium	1.00	101	100	RPD = 0.995	
Magnesium	1.00	42.1	43.2	RPD = 2.58	
TDS	50.0	424	408	RPD = 3.85	
Criteria: When both results are ≥ 5x the QL, RPDs must be ≤30%. When one or both results are <5x the QL, AbsD must be ≤QL.					

Sample Results and Quantitation Limits

The table below summarizes the dilutions that were performed on the samples in this data set. The QLs for these samples were elevated accordingly, and the nondetect COD results for samples MW-3 and DUP-01 were affected. No validation action was taken on this basis.

Sample IDs	Analyte	Dilution	Reason for Dilution
MW-3	COD	2-fold	The case narrative indicated that these samples were analyzed at a dilution for COD due to the chloride pre-screening results.
DUP-01			
MW-1			Dilutions were performed due to elevated concentrations of target analytes which would have exceeded or been close to exceeding the calibration range if not diluted.
S2 Leachate Open			
S2 Underliner Closed			
Combined Leachate			
MW-3	Sulfate	5-fold	
S2 Leachate Open		20-fold	
S2 Underliner Closed			
Combined Leachate			
MW-3	Chloride	5-fold	
S2 Leachate Open		20-fold	
S2 Underliner Closed			

It should be noted that the TDS analyses of samples S2 Leachate Open, Combined Leachate, and S2 Underliner Closed were likely performed with reduced volumes as the QLs were 5x higher than other samples. Since TDS was detected in these samples, there was no adverse impact to the data.

It should be noted that the RLs for ammonia were 0.5 mg/L in leachate samples and 0.2 mg/L in groundwater samples due to the use of different preparation methods for each matrix.

QUALIFIED FORM 1s

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Leachate Open

Lab Sample ID: 310-293885-1

Date Collected: 10/28/24 11:30
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**79.8**		1.00		mg/L			10/29/24 23:22	1
Nitrate as N	<0.200		0.200		mg/L			10/29/24 23:22	1
Fluoride	**0.562**		0.200		mg/L			10/29/24 23:22	1
Sulfate	**43.5**		1.00		mg/L			10/29/24 23:22	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.880**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:33	1
Boron	**8.90**		0.200		mg/L		10/31/24 09:30	11/08/24 11:33	1
Calcium	**133**		1.00		mg/L		10/31/24 09:30	11/08/24 11:33	1
Iron	**9.01**		0.500		mg/L		10/31/24 09:30	11/08/24 11:33	1
Lithium	**0.198**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:33	1
Magnesium	**41.3**		1.00		mg/L		10/31/24 09:30	11/08/24 11:33	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**3.67**		0.500		mg/L		11/05/24 07:47	11/05/24 19:19	1
Chemical Oxygen Demand (SM 5220D LL)	**31.8**		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 21:57	1
Total Dissolved Solids (SM 2540C)	**938**		50.0		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S2 Leachate Open

Date Collected: 10/28/24 11:35
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	107		20.0		mg/L			10/30/24 00:09	20
Nitrate as N	0.670		0.200		mg/L			10/29/24 23:53	1
Fluoride	1.02		0.200		mg/L			10/29/24 23:53	1
Sulfate	1210		20.0		mg/L			10/30/24 00:09	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0299		0.0100		mg/L		10/31/24 09:30	11/08/24 11:35	1
Boron	22.5		0.200		mg/L		10/31/24 09:30	11/08/24 11:35	1
Calcium	181		1.00		mg/L		10/31/24 09:30	11/08/24 11:35	1
Iron	1.20		0.500		mg/L		10/31/24 09:30	11/08/24 11:35	1
Lithium	1.12		0.0500		mg/L		10/31/24 09:30	11/08/24 11:35	1
Magnesium	143		1.00		mg/L		10/31/24 09:30	11/08/24 11:35	1
Molybdenum	0.0547		0.0500		mg/L		10/31/24 09:30	11/08/24 11:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.40		0.500		mg/L		11/05/24 07:47	11/05/24 19:21	1
Chemical Oxygen Demand (SM 5220D LL)	71.9		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0220		0.0220		mg/L		11/01/24 09:05	11/01/24 21:58	1
Total Dissolved Solids (SM 2540C)	2330		250		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 Underliner Open

Date Collected: 10/28/24 11:20
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**60.2**		1.00		mg/L			10/30/24 00:24	1
Nitrate as N	**2.54**		0.200		mg/L			10/30/24 00:24	1
Fluoride	**0.456**		0.200		mg/L			10/30/24 00:24	1
Sulfate	**34.1**		1.00		mg/L			10/30/24 00:24	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.642**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:37	1
Boron	**3.72**		0.200		mg/L		10/31/24 09:30	11/08/24 11:37	1
Calcium	**92.2**		1.00		mg/L		10/31/24 09:30	11/08/24 11:37	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:37	1
Lithium	**0.0743**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:37	1
Magnesium	**38.0**		1.00		mg/L		10/31/24 09:30	11/08/24 11:37	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.500		0.500		mg/L		11/05/24 07:47	11/05/24 19:21	1
Chemical Oxygen Demand (SM 5220D LL)	**18.8**		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0212		0.0212		mg/L		11/01/24 09:05	11/01/24 21:59	1
Total Dissolved Solids (SM 2540C)	**694**		50.0		mg/L			10/31/24 17:16	1

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Client Sample ID: Combined Leachate
Lab Sample ID: 310-293885-4
Date Collected: 10/28/24 11:45
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**92.4**		1.00		mg/L			10/30/24 07:57	1
Nitrate as N	**0.894**		0.200		mg/L			10/30/24 07:57	1
Fluoride	**1.02**		0.200		mg/L			10/30/24 07:57	1
Sulfate	**616**		20.0		mg/L			10/30/24 08:12	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.317**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:39	1
Boron	**15.7**		0.200		mg/L		10/31/24 09:30	11/08/24 11:39	1
Calcium	**158**		1.00		mg/L		10/31/24 09:30	11/08/24 11:39	1
Iron	**4.37**		0.500		mg/L		10/31/24 09:30	11/08/24 11:39	1
Lithium	**0.651**		0.0500		mg/L		10/31/24 09:30	11/08/24 11:39	1
Magnesium	**93.3**		1.00		mg/L		10/31/24 09:30	11/08/24 11:39	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**5.34**		0.500		mg/L		11/05/24 11:57	11/06/24 02:22	1
Chemical Oxygen Demand (SM 5220D LL)	**49.9**		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0208		0.0208		mg/L		11/01/24 09:05	11/01/24 21:59	1
Total Dissolved Solids (SM 2540C)	**1510**		250		mg/L			11/01/24 16:00	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-1

Date Collected: 10/28/24 14:57
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.82**		1.00		mg/L			10/30/24 08:28	1
Nitrate as N	<0.200		0.200		mg/L			10/30/24 08:28	1
Fluoride	<0.200		0.200		mg/L			10/30/24 08:28	1
Sulfate	**23.7**		1.00		mg/L			10/30/24 08:28	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0853**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:41	1
Boron	<0.200		0.200		mg/L		10/31/24 09:30	11/08/24 11:41	1
Calcium	**68.8**		1.00		mg/L		10/31/24 09:30	11/08/24 11:41	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:41	1
Lithium	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:41	1
Magnesium	**37.9**		1.00		mg/L		10/31/24 09:30	11/08/24 11:41	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:45	1
Chemical Oxygen Demand (SM 5220D LL)	**12.3**		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:00	1
Total Dissolved Solids (SM 2540C)	**340**		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-2

Date Collected: 10/28/24 13:24
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-6

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**7.58**		1.00		mg/L			10/30/24 08:43	1
Nitrate as N	**1.52**		0.200		mg/L			10/30/24 08:43	1
Fluoride	<0.200		0.200		mg/L			10/30/24 08:43	1
Sulfate	**19.9**		1.00		mg/L			10/30/24 08:43	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0857**		0.0100		mg/L		10/31/24 09:30	11/08/24 11:43	1
Boron	<0.200		0.200		mg/L		10/31/24 09:30	11/08/24 11:43	1
Calcium	**101**		1.00		mg/L		10/31/24 09:30	11/08/24 11:43	1
Iron	<0.500		0.500		mg/L		10/31/24 09:30	11/08/24 11:43	1
Lithium	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:43	1
Magnesium	**42.1**		1.00		mg/L		10/31/24 09:30	11/08/24 11:43	1
Molybdenum	<0.0500		0.0500		mg/L		10/31/24 09:30	11/08/24 11:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:48	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0216		0.0216		mg/L		11/01/24 09:05	11/01/24 22:01	1
Total Dissolved Solids (SM 2540C)	**424**		50.0		mg/L			11/01/24 17:05	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: MW-3

Date Collected: 10/28/24 11:33
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**112**		5.00		mg/L			10/30/24 09:46	5
Nitrate as N	**0.782**		0.200		mg/L			10/30/24 09:30	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:30	1
Sulfate	**119**		5.00		mg/L			10/30/24 09:46	5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0628**		0.0100		mg/L		11/01/24 09:30	11/10/24 16:58	1
Boron	**2.35**		0.200		mg/L		11/01/24 09:30	11/10/24 16:58	1
Calcium	**129**		1.00		mg/L		11/01/24 09:30	11/10/24 16:58	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 16:58	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:58	1
Magnesium	**59.2**		1.00		mg/L		11/01/24 09:30	11/10/24 16:58	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 16:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:52	1
Chemical Oxygen Demand (SM 5220D LL)	<10.0		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:01	1
Total Dissolved Solids (SM 2540C)	**810**		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Job ID: 310-293885-1
Project/Site: John Deere Dubuque Landfill (TRC)

Client Sample ID: EB-01
Lab Sample ID: 310-293885-8

Date Collected: 10/28/24 14:35
Matrix: Water
Date Received: 10/29/24 08:50

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/30/24 09:30	1
Nitrate as N	<0.200		0.200		mg/L			10/30/24 09:30	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:30	1
Sulfate	<1.00		1.00		mg/L			10/30/24 09:30	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.0100		0.0100		mg/L		11/01/24 09:30	11/10/24 17:12	1
Boron	<0.200		0.200		mg/L		11/01/24 09:30	11/10/24 17:12	1
Calcium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 17:12	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 17:12	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:12	1
Magnesium	<1.00		1.00		mg/L		11/01/24 09:30	11/10/24 17:12	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:53	1
Chemical Oxygen Demand (SM 5220D LL)	<5.00		5.00		mg/L			11/05/24 10:34	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	<50.0		50.0		mg/L			11/01/24 17:05	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: Dup-01

Date Collected: 10/28/24 00:00
Date Received: 10/29/24 08:50

Lab Sample ID: 310-293885-9

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**7.50**		1.00		mg/L			10/30/24 09:46	1
Nitrate as N	**1.53**	H	0.200		mg/L			10/30/24 09:46	1
Fluoride	<0.200		0.200		mg/L			10/30/24 09:46	1
Sulfate	**19.6**		1.00		mg/L			10/30/24 09:46	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.0867**		0.0100		mg/L		11/01/24 09:30	11/10/24 17:14	1
Boron	<0.200		0.200		mg/L		11/01/24 09:30	11/10/24 17:14	1
Calcium	**100**		1.00		mg/L		11/01/24 09:30	11/10/24 17:14	1
Iron	<0.500		0.500		mg/L		11/01/24 09:30	11/10/24 17:14	1
Lithium	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:14	1
Magnesium	**43.2**		1.00		mg/L		11/01/24 09:30	11/10/24 17:14	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	<0.200		0.200		mg/L			10/31/24 00:54	1
Chemical Oxygen Demand (SM 5220D LL)	<10.0		10.0		mg/L			11/05/24 10:34	2
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	**408**		50.0		mg/L			11/01/24 17:05	1

Client Sample Results

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S1 underliner Closed

Date Collected: 10/29/24 11:05
Date Received: 10/30/24 09:00

Lab Sample ID: 310-293962-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**74.9**		1.00		mg/L			10/30/24 14:26	1
Nitrate as N	**0.967**		0.200		mg/L			10/30/24 14:26	1
Fluoride	**0.640**		0.200		mg/L			10/30/24 14:26	1
Sulfate	**47.5**		1.00		mg/L			10/30/24 14:26	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.677**		0.0100		mg/L		11/01/24 09:30	11/10/24 17:16	1
Boron	**8.10**		0.200		mg/L		11/01/24 09:30	11/10/24 17:16	1
Calcium	**123**		1.00		mg/L		11/01/24 09:30	11/10/24 17:16	1
Iron	**6.42**		0.500		mg/L		11/01/24 09:30	11/10/24 17:16	1
Lithium	**0.192**		0.0500		mg/L		11/01/24 09:30	11/10/24 17:16	1
Magnesium	**41.9**		1.00		mg/L		11/01/24 09:30	11/10/24 17:16	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	**2.02**		0.500		mg/L		11/05/24 07:47	11/05/24 20:22	1
Chemical Oxygen Demand (SM 5220D LL)	**27.4**		5.00		mg/L			11/07/24 10:17	1
Phenols, Total (SW846 9066)	<0.0200		0.0200		mg/L		11/01/24 09:05	11/01/24 22:02	1
Total Dissolved Solids (SM 2540C)	**880**		50.0		mg/L			11/02/24 13:46	1

Client: John Deere & Co
Project/Site: John Deere Dubuque Landfill (TRC)

Job ID: 310-293885-1

Client Sample ID: S2 underliner Closed

Date Collected: 10/29/24 11:10
Date Received: 10/30/24 09:00

Lab Sample ID: 310-293962-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	376		20.0		mg/L			10/30/24 14:11	20
Nitrate as N	1.24		0.200		mg/L			10/30/24 13:55	1
Fluoride	1.41		0.200		mg/L			10/30/24 13:55	1
Sulfate	1380		20.0		mg/L			10/30/24 14:11	20

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	0.0359		0.0100		mg/L		11/01/24 09:30	11/10/24 17:18	1
Boron	22.7		0.200		mg/L		11/01/24 09:30	11/10/24 17:18	1
Calcium	190		1.00		mg/L		11/01/24 09:30	11/10/24 17:18	1
Iron	3.06		0.500		mg/L		11/01/24 09:30	11/10/24 17:18	1
Lithium	1.13		0.0500		mg/L		11/01/24 09:30	11/10/24 17:18	1
Magnesium	149		1.00		mg/L		11/01/24 09:30	11/10/24 17:18	1
Molybdenum	<0.0500		0.0500		mg/L		11/01/24 09:30	11/10/24 17:18	1

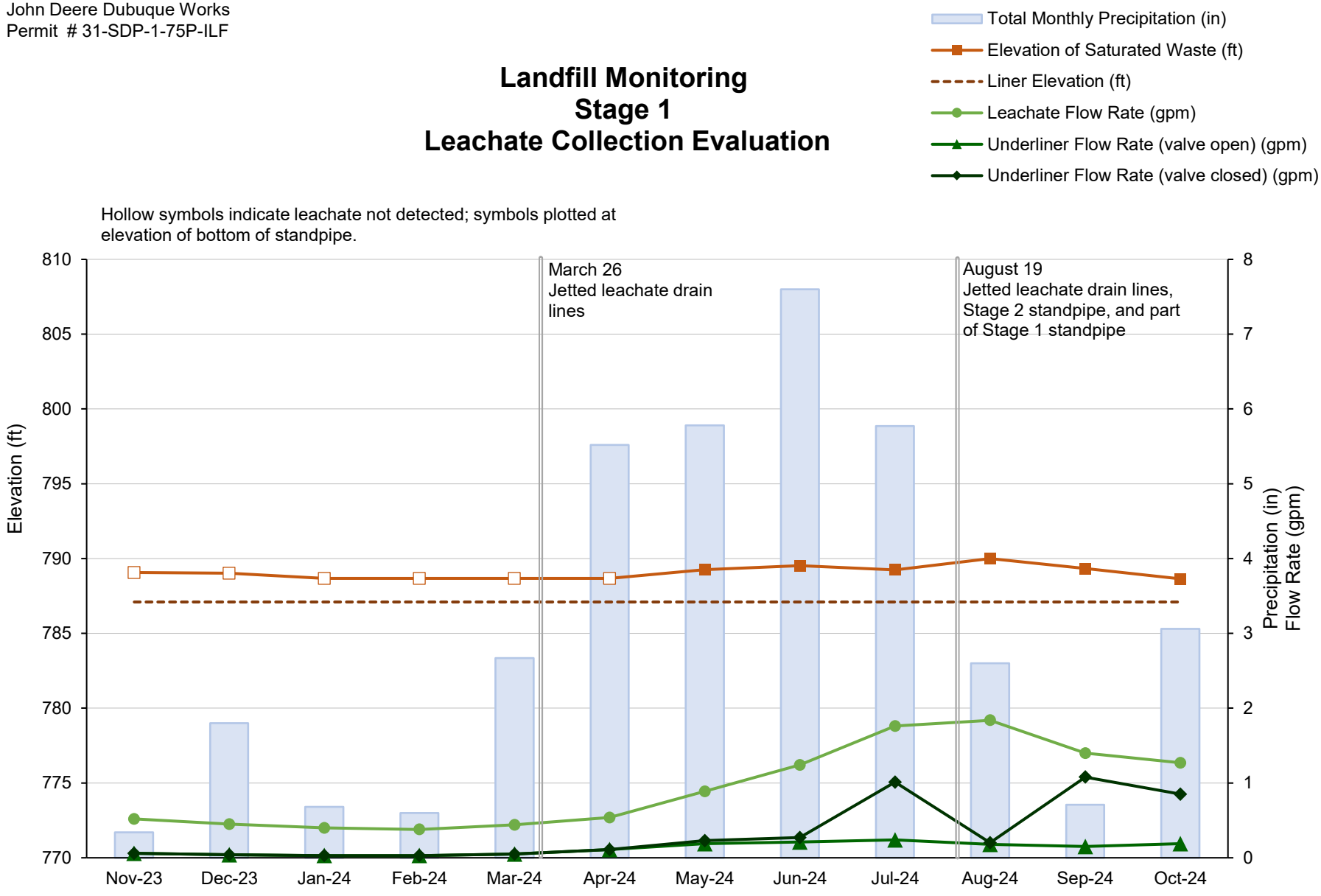
General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia as N (EPA 350.1)	8.06		0.500		mg/L		11/05/24 07:47	11/05/24 19:18	1
Chemical Oxygen Demand (SM 5220D LL)	69.4		10.0		mg/L			11/07/24 10:17	2
Phenols, Total (SW846 9066)	<0.0212		0.0212		mg/L		11/01/24 09:05	11/01/24 22:03	1
Total Dissolved Solids (SM 2540C)	2250		250		mg/L			11/02/24 13:46	1

Appendix G: Leachate Collection System Evaluation Graphs

John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring
Stage 1
Leachate Collection Evaluation



John Deere Dubuque Works
Permit # 31-SDP-1-75P-ILF

Landfill Monitoring
Stage 2
Leachate Collection Evaluation