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November 25, 2025

Mr. Brian Rath
Land Quality Bureau
Iowa Department of Natural Resources
6200 Park Ave
Des Moines, IA 50321

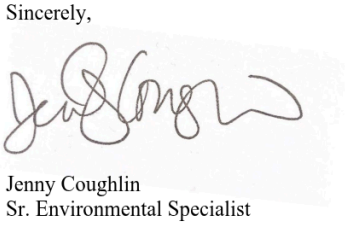
Subject: 2025 Annual Water Quality Report
Interstate Power and Light Company – Ottumwa Midland Landfill
Permit #90-SDP-8-92P

Dear Mr. Rath:

On behalf of Interstate Power and Light Company (IPL), Alliant Energy is providing the enclosed 2025 Annual Water Quality Report for the Ottumwa Midland Landfill, as required by Permit #90-SDP-8-92P and associated amendments.

Please call me at (515) 558-9704 or email me at jennycoughlin@alliantenergy.com with any questions regarding the enclosed report.

Sincerely,



Jenny Coughlin
Sr. Environmental Specialist
Alliant Energy Corporate Services, Inc.

Enclosures

Cc: IDNR Field Office #6
Matt Loehr – IPL Ottumwa Generating Station
Meghan Blodgett, Thomas Karwoski – SCS Engineers

2025 Annual Water Quality Report

Interstate Power and Light Company
Ottumwa-Midland Landfill
Permit #90-SDP-8-92P

Alliant Energy
4902 North Biltmore Lane
Madison, Wisconsin 53718

SCS ENGINEERS

25225073.00 | November 25, 2025

2830 Dairy Drive
Madison, WI 53718
608-224-2830

CERTIFICATION

I, Thomas J. Karwoski, hereby certify that this report was prepared by me, or under my direct supervision, and that I am a qualified ground water scientist as defined in IAC SS 113.10(1)d.

Signature

November 25, 2025
Date

Pages or Sheets Covered by this Certification:

2025 Annual Water Quality Report, Interstate Power and Light Company
Ottumwa-Midland Landfill, Permit #90-SDP-8-92P

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EXECUTIVE SUMMARY

Period of Report Coverage

The period of coverage for this report is from November 2024 through October 2025. The report includes the April 2025 water level measurement event and the August 2025 groundwater sampling event conducted at the Ottumwa-Midland Landfill (OML, also referred to as Site). OML is a coal combustion residual (CCR) landfill located near Ottumwa, Iowa (**Figure 1**).

Report Priority

Comparison of the 2025 results to the Groundwater Protection Standards (GWPSs) indicated only one new GWPS exceedance. The new GWPS exceedance was for lithium at new monitoring well MW-125. GWPS exceedances in 2025 were:

- Shallow wells:
  - Cobalt above the Statewide Standard (SWS) at MW-15R and MW-108
  - Lithium at MW-1R, MW-15R, MW-100R, MW-101R, and MW-108
  - Manganese above the SWS at wells MW-15R and MW-108

- Mid-depth Pennsylvanian wells:
  - Lithium at MW-12, MW-13, MW-14, MW-16R, MW-102P, and MW-125

Lithium concentrations at all sampled monitoring wells in August 2025 exceeded the GWPS (14 micrograms per liter [µg/L]). August 2023 was the first sampling event in which lithium was included, background concentrations have not yet been calculated. However, the widespread nature of lithium GWPS exceedances and the fact that the highest detected lithium concentrations was at background Pennsylvanian well MW-102P indicate that elevated lithium concentrations occur naturally at the Site.

The two shallow wells with cobalt and manganese exceedances are screened at or across the top of the Pennsylvanian shale. As shown on **Figures 3** and **5**, both are upgradient of the landfill. The cobalt and manganese GWPS exceedances at MW-15R and MW-108 may reflect natural variation within the shale and/or impacts related to the presence of coal and historic coal-mining activities.

SCS Engineers (SCS) recommends that the current monitoring program be continued during 2026, as described in **Section 9.0**, with the exception that the abandonment of MW-17 is recommended. New monitoring well MW-125 was installed to the south of TCB-1/2 in November 2024, and documentation of the well installation was submitted under separate cover. This well was included in the 2025 monitoring program and will be retained in the monitoring program in 2026.

Site Status and Applicable Rules

The following summarizes the Site status and applicable rules associated with groundwater sampling at the OML site:

- **Landfill Status:** Active

- **Types of Wastes Accepted:** CCR

- **Applicable Iowa Administrative Code (IAC) Rules:** 567-103 current version, 567-115.26(6) (certain provisions), 567-115.21 (referenced for monitoring well maintenance and evaluation requirements, in place of the rescinded 567-110.9). The monitoring and reporting were also performed in accordance with the provisions of the variance to 567-103.1(2)f granted on July 20, 2017, and the conditions of the landfill permit renewal dated July 21, 2017.

Table of Contents

Section Page

Tables

Figures

Appendices

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ACRONYMS/ABBREVIATIONS

CCR = Coal Combustion Residual
COC = Chain of Custody
EPA = Environmental Protection Agency
GWPS = Groundwater Protection Standard
IAC = Iowa Administrative Code
IDNR = Iowa Department of Natural Resources
LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
MCL = EPA Maximum Contaminant Level
OML or Site = Ottumwa-Midland Landfill
QA/QC = Quality Assurance/Quality Control
RCRA = Resource Conservation and Recovery Act
SCS = SCS Engineers
SMCLs = Secondary Maximum Contaminant Levels
SWS = IDNR Statewide Standard for a protected groundwater source
SSI = Statistically Significant Increase above background
UPL = Upper Prediction Limits
U.S. EPA = U.S. Environmental Protection Agency

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1.0 SITE BACKGROUND

1.1 SITE HISTORY

The Ottumwa Midland Landfill (OML, also referred to as Site) is an active Coal Combustion Residual (CCR) landfill located near Ottumwa, Iowa (**Figure 1**). OML accepted waste during the 2024 to 2025 period covered by this report. The amount of CCR accepted during this period is provided in the Annual Facility Inspection Summary (**Appendix G**). A site plan is shown on **Figure 2**.

The southern portion of the landfill was developed in a former clay mine pit. Mining operations included the excavation of the unconsolidated clay material and approximately 40 feet of shale from the pit. Spoils from the mining operation, including both unconsolidated material and shale, were stockpiled to the east, west, and south of the existing CCR landfill. Collapsed underground coal mines appear to exist in the southeastern and northwestern portions of the property, outside the active filling area. More details regarding the Site geology can be obtained in the Hydrogeological Investigation Reports prepared by Montgomery Watson in May 1994 (Montgomery Watson, 1994) and by SCS in August 2013 (SCS, 2013).

Expansion construction began at the Site in March 2014, following the issuance of Amendment #6 to Permit #90-SDP-08-92P, issued February 28, 2014. The Phase 1 Liner Construction Documentation Report was approved by the Iowa Department of Natural Resources (IDNR) on January 12, 2016, and CCR disposal in Phase 1 of the expansion began in October 2016. Monitoring wells associated with Phase 1 of the landfill expansion were added to the groundwater sampling program in September 2015. The sampling program is summarized in **Table 1**. Additional parameters were included in the August 2023, 2024, and 2025 monitoring events as outlined in communications with IDNR prior to the sampling event, including the Recommended Assessment Steps document submitted to IDNR on June 30, 2023.

1.2 SITE HYDROGEOLOGY

1.2.1 Geology

The Site geology consists of unconsolidated deposits of loess and till (generally silt and clay), which overlie the Pennsylvanian shale. The unconsolidated material and up to 40 feet of shale were removed from the original landfill area during historic clay mining operations at the Site. The base of the landfill is within the Pennsylvanian shale. Mississippian limestone and sandstone underlie the Pennsylvanian shale. Coal beds are present within the Pennsylvanian shale, and evidence of historical underground mining of these coal beds has been observed at the OML site. The Pennsylvanian shale is considered to be a confining unit, and the Mississippian limestone and sandstone unit is considered to be the uppermost aquifer in the area.

More detailed descriptions of the regional and local geology are provided by the Hydrogeological Investigation Reports prepared by Montgomery Watson in May 1994 (Montgomery Watson, 1994) and SCS in August 2013 (SCS, 2013).

1.2.2 Hydrogeology/Groundwater Flow Conditions

Groundwater and surface water levels were measured during April and August 2025, as shown in **Table 2**. The groundwater levels during the August event were measured prior to purging the wells for sampling. The groundwater and surface water elevation data are included in **Table 4A**. The April and August 2025 water level data were used to create water table and potentiometric surface maps (**Figure 3** through **Figure 6**). Flow directions were consistent with historical data.

The shallow groundwater flow direction within the landfill area in April and August 2025 was generally inward toward the southern portion of the Existing Landfill. Shallow groundwater flow in the area of the Existing Landfill and Expansion Phase 1 appears to be influenced by the landfill's underdrain system and by site topography. In the northwestern portion of the Site, which has not been developed, the shallow groundwater flow direction is strongly influenced by topography.

Within the Pennsylvanian unit, groundwater elevations in 2025 show little variation across the site. As noted on **Figures 4** and **6**, Pennsylvanian piezometer MW-110P was not used in development of the 2025 flow maps. Groundwater elevations at new well MW-125, which is located approximately 300 feet horizontally of MW-110P, are consistent with elevations in other Pennsylvanian wells at the site and indicate that groundwater elevations measured at MW-110P are not representative of general conditions within the Pennsylvanian unit at the site. MW-125 is screened within the Pennsylvanian unit and also represents the shallowest groundwater observed at this location (e.g., water table).

2.0 SAMPLING STATUS SUMMARY

The IDNR requested that sampling data be summarized in a series of tables to consistently convey information related to groundwater monitoring at CCR landfills throughout Iowa. These tables are discussed within the text in appropriate sections as noted and included in the Tables section at the end of the text. **Table 1** provides an overview of the sampling status for the Site, including the monitoring points in the program, current monitoring program, comparative statistics findings, and the number of samples collected. **Figure 2** depicts the monitoring network for OML.

Field sheets from the August 2025 sampling event are included in **Appendix A**. Sampling completed in 2018 through 2025 and anticipated sampling for 2026 are summarized in **Table 2**. The laboratory analytical reports for the 2025 sampling events are included in **Appendix B**. Groundwater chemistry summary tables for sampling performed before 2020 are included in **Appendix C**. Summary tables of groundwater chemistry data for sampling performed since transitioning to unfiltered sampling in 2017 are included with the statistical analysis in **Appendix D**.

2025 was the third year in which parameters calcium, lithium, molybdenum, and total suspended solids (TSS) were included in the sampling program, as requested by IDNR. Because of the low number of samples for the parameters listed above, Upper Prediction Limits (UPLs) cannot be calculated at this time. UPL calculations for these parameters will be included in the report when a minimum of four samples have been collected at background wells. Additionally, field parameters dissolved oxygen (DO) and oxidation-reduction potential (ORP) are included in the tables of this AWQR for evaluation of the potential influences on groundwater chemistry due to reducing groundwater conditions. DO and ORP are required parameters to determine stability during low-flow sampling and have been included in Annual Water Quality Reports (AWQRs) prior to 2023 on field sheets.

3.0 MONITORING WELL MAINTENANCE AND PERFORMANCE SUMMARY

Iowa Administrative Code (IAC) 567-115.21 was referenced for monitoring well maintenance and evaluation, in place of the rescinded 567-110.9. Each requirement is listed below in italics, followed by text describing how the requirement was addressed. **Table 3** provides the years in which each requirement was previously met and for which it is next scheduled.

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.*

Water levels are measured twice annually at the Site, in April and August. The screens of several shallow monitoring wells were submerged in April and/or August 2025 as shown in **Table 4A**. Vertical gradients at well nests are presented in **Table 4B**. The locations and depths of the wells continue to be acceptable for monitoring the Site.

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.*

Comparison of the 2025 groundwater contour maps and calculated vertical gradients to previous data indicates that the April and August 2025 groundwater flow conditions are consistent with historical conditions. Shallow groundwater flow at the Site is strongly influenced by the landfill's underdrain system and the Site's topography.

c. *Annual measurement of well depths to ensure that wells are physically intact and not filling with sediment.*

Well depths measured during April and August 2025 in all wells that do not contain dedicated pumps are summarized in **Table 4A**. The maximum discrepancy between the measured total depth and as-installed total depth was less than 1 foot in all wells during at least one event in 2025 except MW-9P and MW-9M. Total depths are measured with a flexible water level tape, and it can be difficult to obtain accurate total depth readings, particularly in deeper wells. Total depths at these wells will continue to be monitored and compared to the as-built depths in 2026.

d. *Every five years conduct in-situ permeability tests on monitoring wells to compare test data with those collected originally to determine if well deterioration is occurring.*

A variance to IAC 567-110.9(2)(d) for in situ permeability tests every 5 years was granted by IDNR in a letter dated April 1, 1999. Although IAC 567-110 has been rescinded since the variance was granted, the same permeability test requirements are now in IAC 567-115.21(2), and our understanding is that the conditions of the variance still apply. The conditions of the variance state that, if a well cannot be sampled or purged because of plugging, the well will be replaced within 6 months of reporting this condition to IDNR in the annual report. The monitoring wells at this Site are performing adequately as noted above.

3.1 WELL MAINTENANCE RECOMMENDATIONS

No well maintenance activities are recommended based on observations during the 2025 sampling events.

One new monitoring well, MW-125, was installed downgradient of temporary contact water basin TCB-1/2 in November 2024. Documentation of the well installation was submitted to IDNR on April 7, 2025. The well was sampled in April and August 2025 and results of these sampling events are included in this AWQR.

4.0 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Data validation quality assurance/quality control (QA/QC) procedures are performed on analytical results for laboratory quality control samples, and a quality assurance assessment of the data is conducted as the data are generated. The QA/QC review procedure provides documentation of the accuracy and precision of the analytical data and confirms that the analyses are sufficiently sensitive to detect constituents at levels below regulatory standards, where such standards exist. QA/QC data validation includes review of sample handling, analytical sensitivity, blanks, accuracy, and precision. The QA/QC and data validation procedures and findings are discussed in more detail below.

4.1 SAMPLE COLLECTION AND HANDLING

Groundwater samples are collected using dedicated low-flow pumps. Samples are not field filtered. A water level measurement tape is the only down-hole equipment used in multiple wells and is decontaminated between wells. All samples are placed on ice after collection and are transported to the laboratory in sealed coolers under Chain of Custody (COC).

Sample receipt forms were reviewed and checked to verify that samples were received in good condition and within the acceptable temperature range. COC records for each sampling event were reviewed and confirmed that information was complete.

Monitoring well MW-17 and leachate headwell LP-1 were not sampled in August 2025 because they were dry during the sampling event. Surface water monitoring points SW-1, SW-2, SW-4, and SW-5, and groundwater underdrain monitoring point GU-2 were not sampled in August 2025 because they were either dry or insufficient water was present for sample collection.

4.2 ANALYTICAL SENSITIVITY AND BLANKS

Laboratory QA/QC procedures and post-analysis data validation assist in producing data of acceptable quality and reliability. Eurofins - Cedar Falls is a certified laboratory in Iowa and performed QA/QC procedures, including analyzing laboratory method blanks in association with samples collected for the project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. A field blank was submitted with the groundwater samples to assess whether cross-contamination occurred during sample handling and transport. Multiple analytes were detected in the August 2025 field blank sample. Detections above the limit of quantitation included chloride, fluoride, sulfate, zinc, and total dissolved solids (TDS). Detections below the limit of quantitation ("J" flagged) in the field blank include barium, boron, and calcium. One "J" flagged detection of barium was reported in one method blank. SCS contacted the laboratory to confirm sample validity. The laboratory stated all samples had been analyzed at least twice to confirm results, and samples were confirmed as valid.

4.3 ACCURACY

Laboratory analytical accuracy can be assessed by evaluating the constituent recoveries from the following laboratory QA/QC samples: laboratory control sample (LCS), LCS duplicate (LCSD), matrix spike (MS), and MS duplicate (MSD). LCS/LCSD samples assess the accuracy of analytical procedures by checking the ability to recover constituents added to clean aqueous matrices. MS/MSD samples check the ability to recover constituents added to the sample matrix. Because the QC samples are run by the laboratory on a per-batch basis and a batch may include other projects, the MS/MSD results run with the batch are included in the laboratory report only if the sample used for the MS/MSD originated in the OML project.

For the analysis of the April and August 2025 samples, LCS, MS, and MSD results reported in the analytical laboratory report were within applicable control limits. Control limits did not apply to some parameters due to analyte concentrations present in the original sample.

4.4 DATA QUALITY SUMMARY

Based on the above QA/QC procedures and the field sampling standard operating procedures, the samples collected during this reporting period are considered to be representative of Site conditions at the locations and times they were obtained. Based on the QA/QC review, no samples were rejected as unusable due to QC failures or other issues identified during the data review.

5.0 COMPARISON TO STANDARDS

5.1 STATISTICAL ANALYSIS

Statistical analysis is completed for the Site on an annual basis. The 2025 Annual Statistical Summary Report is included in **Appendix D**, including a summary table of data used for the statistical analysis of each parameter. **Table 5** provides the background and Groundwater Protection Standard (GWPS) summary for the Site.

Groundwater samples collected in 2025 were unfiltered, in accordance with the variance to 567-103.1(2)f granted on July 20, 2017, and the conditions of the landfill permit renewal dated July 21, 2017. The 2025 sampling event was the ninth round of unfiltered samples collected at the Site, and 2025 was the sixth reporting period during which the statistical approach described below was applied at the Site.

The selected statistical analysis method uses a prediction interval approach as recommended for detection monitoring in the March 2009 U.S. Environmental Protection Agency (U.S. EPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (Unified Guidance).

Interwell testing was selected for the prediction interval evaluation, with monitoring well MW-1/1R used as the background well for the shallow unit and MW-102P used as the background well for the mid-depth Pennsylvanian unit. Monitoring results from the downgradient wells were compared to the UPLs to evaluate whether a Statistically Significant Increase (SSI) over background has occurred. UPL calculations were completed in 2025 using the nine rounds of unfiltered sample results for metals and a longer data record for anions that are not typically affected by filtration (e.g., chloride, sulfate). UPL calculations are intended to be updated every 2-3 years, therefore the next UPL update is scheduled for 2027 or 2028.

Detection of an SSI at a compliance well indicates that the groundwater quality is different than the background groundwater quality, but does not necessarily indicate an impact to public health or the environment.

To evaluate potential health impacts, the monitoring results were compared to health-based GWPS values. The GWPS values were set at the drinking water EPA Maximum Contaminant Level (MCL) if one exists; otherwise, the Iowa Statewide Standard (SWS) for protected groundwater was used. If the UPL established based on background monitoring was higher than the MCL or SWS, then the GWPS was set at the UPL. Secondary Maximum Contaminant Levels (SMCLs) were not used to establish GWPS values because SMCLs are not health-based standards, but they are shown in **Table 5** for comparison with the UPL and GWPS values.

5.2 2025 RESULTS

Table 6 is a summary of monitoring points/detected constituents from the 2025 sampling event that did not exceed a UPL. **Table 7** provides a summary of ongoing and newly identified SSIs and compares these concentrations to the GWPS values.

Table 8 provides a visualization of the historic SSIs and regulatory standard exceedances since 2017, the first year during which unfiltered samples were collected at the Site. **Table 8** does not identify SSIs prior to 2020, as this was the first year UPLs were calculated.

August 2025 is the ninth event completed since transitioning to unfiltered sampling. Where enough data has been collected to date, trend analyses for wells and parameters with regulatory standard exceedances were performed. **Table 10** provides a summary of the wells, parameters and trends that were performed. The Trends report can be found in **Appendix E**.

5.3 STANDARDS HISTORY

The standards for 2020 through 2025 are summarized in **Table 9**. Graphs of standards history were not prepared because this is only the sixth year that UPL calculations have been completed since the transition to unfiltered sampling and the change in statistical method. Graphs will be added in future AWQRs when appropriate.

6.0 SUMMARY OF FINDINGS FOR GROUNDWATER

This was the sixth year that the new statistical approach using UPLs was implemented; results have only been compared to the UPLs calculated for the current year. The UPL exceedances noted for 2025 were generally similar to the UPL exceedances in 2024 and to results flagged as being above background using the previous method (mean plus two standard deviations).

Comparison of the 2025 results to the GWPSs indicated no new GWPS exceedances except for a lithium at MW-125. This well was installed on November 16, 2024, and sampled for the first time in April 2025. The August 2025 sampling event was the second sampling event at this well. The April and August MW-125 results are included in this report. GWPS exceedances in 2025 were:

- Shallow wells:
  - Cobalt above the SWS at MW-15R and MW-108
  - Lithium above the GWPS at MW-1R, MW-15R, MW-100R, MW-101R, and MW-108
  - Manganese above the SWS at wells MW-15R and MW-108

- Mid-depth Pennsylvanian wells:
  - Lithium at MW-12, MW-13, MW-14, MW-16R, MW-102P, and MW-125

The two shallow wells with cobalt and manganese exceedances (MW-15R and MW-108) are screened at or across the top of the Pennsylvanian shale. As shown on **Figures 3** and **5**, both are upgradient of the landfill. The cobalt and manganese GWPS exceedances at MW-15R and MW-108 may reflect natural variation within the shale and/or impacts related to the presence of coal and historic coal mining activities.

Lithium concentrations at all sampled monitoring wells in August 2025 exceeded the GWPS (14 µg/L). August 2023 was the first sampling event in which lithium was included in the monitoring program, background concentrations have not yet been calculated. However, the widespread nature of lithium GWPS exceedances and the fact that the highest detected lithium concentrations was at background Pennsylvanian well MW-102P indicate that elevated lithium concentrations occur naturally at the Site.

MW-17 was not sampled in August events in 2022 to 2025 because it was dry during each sampling event, but the results for the August 2021 event indicated that concentrations of cobalt and manganese exceeded the SWS. MW-17 was installed in an unconventional manner, in a trench adjacent to the sedimentation basin rather than installed in a boring like a typical monitoring well. Based on this unusual construction MW-17 may not be providing representative or useful data in the context of groundwater monitoring at the Site. In its response to the 2024 AWQR, IDNR requested that IPL review the HMSP and determine a location for a replacement well, if applicable. IPL proposes abandoning MW-17 and not installing a replacement well for the following reasons:

- MW-17 is located upgradient of the landfill (**Figures 3** and **5**). MW-13 and MW-14 are located between the landfill and MW-17. In addition, MW-10R is located within 200 feet horizontally of MW-17 and is generally upgradient of MW-17, therefore it is not clear that installation of a replacement well in the vicinity of MW-17 would provide useful data for monitoring groundwater at the site.

- MW-17 is located at the edge of Sedimentation Basin No. 1. Safe access to this area by a drill rig may not be feasible due to the presence of steep slopes and open water in the sedimentation basin.

TSS was added to the monitoring program in 2023. Measured TSS was below 5 milligrams per liter (mg/L) in all monitoring well samples except MW-101R (9.9 mg/L), MW-102P (8.3 mg/L), and the April 2025 results for MW-125 (49 mg/L). Dedicated low flow pumps are used at the Site to minimize sample turbidity at monitoring wells to the extent practicable.

Calcium, lithium, and molybdenum were added to the monitoring program in 2023. Calcium, lithium, and molybdenum were all detected at multiple wells in August 2025. There is no applicable GWPS for calcium. Lithium concentrations are discussed above, and all detected molybdenum concentrations were below the applicable GWPS.

7.0 ADDITIONAL REPORTING

7.1 ANNUAL INSPECTION AND LEACHATE CONTROL SYSTEM PERFORMANCE EVALUATION

The 2025 Annual Facility Inspection Summary and Leachate Control System Performance Evaluation is included in **Appendix G.**

7.2 OTHER MONITORING POINTS

7.2.1 Surface Water Monitoring

Surface water monitoring points SW-1R, SW-2R, SW-4, and SW-5 were dry during the August 2025 sampling event (**Table 4A**). SW-3 was sampled in August 2025. Analytical results for SW-3 were consistent with historical results and are included in **Table 11**.

7.2.2 Leachate Collection System

A sample was voluntarily collected from the leachate storage lagoon during the August 2025 sampling event. The leachate storage lagoon is located on the south side of 130th Street. The Phase 1 and 2 Temporary Contact Water Basin (TCB-1/2) was also sampled in August 2025.

Results for the 2025 leachate samples were consistent with historical results and are included in **Table 11**. Historic analytical results for leachate sample results are included in **Appendix C** and **Appendix F**.

7.2.3 Underdrain System

Samples were collected at the active landfill underdrain system (GU-EX), and the Phase 1 Expansion underdrain system (GU-1 [Temporary]). As is typical, GU-2 (Temporary) was dry as Phase 2 of the landfill has not been constructed.

Results for the 2025 underdrain system were consistent with historical results and are included in **Table 11**. Historic analytical results for leachate sample results are included in **Appendix C** and **Appendix F**.

The facility is collecting discharge from the underdrain using a temporary system and is in the process of installing a permanent system. Updates on this work have been and will continue to be provided to IDNR under separate cover.

8.0 RECEPTOR SURVEY

As requested by IDNR, an updated receptor survey was completed in 2024. SCS contacted Wapello County to request assistance with searching relevant records for water supply sources near OML. Mr. Travis Baily of the Wapello County Engineers Office responded and stated that most of Wapello County is on Rural Water, and searches of the GeoSAM and Private Well Tracking System (PWTS) databases would yield the best information about potentially active private water supply sources in the area. Mr. Baily performed a search of the GeoSAM and PWTS databases and provided the results to SCS. The only PWTS record generated by this search is associated with a monitoring well at OML.

GeoSAM search results for wells apparently located within 1 mile of OML are summarized in **Appendix H**. This map indicates that water supply wells exist within 1 mile of OML to the northeast, northwest, southeast, and south. Wells within 1 mile to the northwest and northeast are hydraulically upgradient or sidegradient and therefore are not expected to be impacted by the landfill. The nearest apparently downgradient water supply wells, identified as #27717 and #18797 in **Appendix H**, are located approximately ½ mile southeast of the landfill in a generally downgradient direction based on flow within bedrock units at the site. Available information about these wells indicates that they are 152 and 293 feet deep, respectively, and are open to limestone and/or sandstone bedrock. Records for both wells indicate they are cased through the Pennsylvanian shale, which is regionally considered an aquiclude. Therefore, these wells are not expected to be impacted by the landfill. The Des Moines River is approximately 2 miles southwest of OML.

9.0 RECOMMENDATIONS

SCS recommends that the current monitoring program be continued during 2026, with the inclusion of calcium, lithium, molybdenum, and TSS. SCS also recommends that MW-17 be considered for abandonment without replacement, as discussed above.

10.0 REFERENCES

Montgomery Watson, 1994, Hydrogeological Investigation Report and Hydrologic Monitoring System Plan, Ottumwa-Midland Commercial Landfill, Ottumwa, IA, May 1994.

SCS Engineers, 2013, Proposed Landfill Expansion Soil and Hydrologic Investigation Report, Ottumwa Midland Landfill, Ottumwa, IA, September 2013.

U.S. Geological Survey, 1983, Water Resources Investigations Open File Report 82-1014, Hydrology of Area 38, Western Region, Interior Coal Province, Iowa and Missouri.

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Tables

Table 1
Monitoring Program Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Monitoring Point	Formation	Current Monitoring Program	Change for Next Sampling Event	UPL Exceedances	Total # of Samples in each monitoring program since January 1, 2018
Sampled Monitoring Wells					
MW-1R*	Shallow (Unconsolidated)	Routine	NC	None#	8
MW-12	Pennsylvanian Shale	Routine	NC	Chloride, Fluoride	8
MW-13	Pennsylvanian Shale	Routine	NC	Chloride	8
MW-14	Pennsylvanian Shale	Routine	NC	Chloride	8
MW-15R	Shallow (Unconsolidated/top of Pennsylvanian)	Routine	NC	Boron, Cobalt, Magnesium, Manganese, TDS	8
MW-16R	Pennsylvanian Shale	Routine	NC	Barium, Chloride	8
MW-17	Shallow (Unconsolidated)	Routine	NC	N/A	4
MW-100R	Shallow (Unconsolidated)	Routine	NC	None	8
MW-101R	Shallow (Unconsolidated)	Routine	NC	Boron, Magnesium, Manganese, Sulfate, TDS	8
MW-102P	Pennsylvanian Shale	Routine	NC	None#	8
MW-108	Shallow (Unconsolidated/top of Pennsylvanian)	Routine	NC	Arsenic, Boron, Cobalt, Iron, Manganese, Zinc	8
MW-125	Pennsylvanian Shale	Routine	NC	April: Barium, Chloride August: Barium, Chloride	2

Table 1
Monitoring Program Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Monitoring Point	Formation	Current Monitoring Program	Change for Next Sampling Event	UPL Exceedances	Total # of Samples in each monitoring program since January 1, 2018
Water Level Only Monitoring Wells					
MW-5	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-6	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-8	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-9P	Pennsylvanian Shale	Routine	NC	N/A	Water levels only
MW-9M	Mississippian Limestone	Routine	NC	N/A	Water levels only
MW-10R	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-11R	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-102	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-102M	Mississippian Limestone	Routine	NC	N/A	Water levels only
MW-107	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-110	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-110P	Pennsylvanian Shale	Routine	NC	N/A	Water levels only
MW-111	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-112	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-115	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-116	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-116P	Pennsylvanian Shale	Routine	NC	N/A	Water levels only
MW-116M	Mississippian Limestone	Routine	NC	N/A	Water levels only
MW-117	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-122	Shallow (Unconsolidated)	Routine	NC	N/A	Water levels only
MW-122P	Pennsylvanian Shale	Routine	NC	N/A	Water levels only
MW-122M	Mississippian Limestone	Routine	NC	N/A	Water levels only

Table 1
Monitoring Program Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Monitoring Point	Formation	Current Monitoring Program	Change for Next Sampling Event	UPL Exceedances	Total # of Samples in each monitoring program since January 1, 2018
Surface Water Monitoring Points					
SW-1R	N/A (Surface Water)	Routine	NC	N/A	1 (typically dry)
SW-2R	N/A (Surface Water)	Routine	NC	N/A	1 (typically dry)
SW-3	N/A (Surface Water)	Routine	NC	N/A	8
SW-4	N/A (Surface Water)	Routine	NC	N/A	2 (often dry)
SW-5	N/A (Surface Water)	Routine	NC	N/A	4
Other Monitoring Points					
Underdrain Wet Well/Pumping Station (GU-EX)	N/A (Underdrain)	Routine	NC	N/A	7
GU-1 Temp	N/A (Underdrain)	Routine	NC	N/A	6
GU-2 Temp	N/A (Underdrain)	Routine	NC	N/A	1 (typically dry)
TCB-1/2	N/A (Temporary Contact Basin)	Routine	NC	N/A	8
Leachate Wet Well/ Pumping Station	N/A (Leachate)	Routine (Voluntary)	NC	N/A	1
LP-1	N/A (Leachate)	Routine (Voluntary)	NC	N/A	0 (typically dry)
Leachate Basin	N/A (Leachate)	Routine (Voluntary)	NC	N/A	8

Comments:
*: MW-1R was installed in 2019 to replace former monitoring well MW-1
#: UPLs do not apply to MW-1R or MW-102P because they are background wells.
N/A = Not Applicable NC = No change

Updated by: RM Date: 10/10/2025
Checked by: LH Date: 10/17/2025

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Table 2
Monitoring Program Implementation Schedule
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

	Recent Sampling Dates and Constituents														
Monitoring Point	**4/19/2018**	**8/14/2018**	**4/16/2019**	**8/7-9/2019**	**5/20-21/2020***	**8/24-25/2020**	**4/12-13 & 15/2021**	**8/9-12/2021**	**4/13-14/2022**	**8/22-24/2022**	**4/3-4/2023**	**8/28-31/2023**	**4/3-4/2024**	**8/6-8/2024**	**4/7-9/**
Sampled Monitoring Wells															
MW-1**	Groundwater Elevation	Not Sampled (Well Dry)	List A + Fluoride and TDS, Groundwater Elevation	Abandoned											
MW-1R**	Not Installed														
MW-12	Groundwater Elevation	List A + Fluoride and TDS, Groundwater Elevation	Groundwater Elevation	List A + Fluoride and TDS, Groundwater Elevation	Groundwater Elevation	List A + Fluoride and TDS, Groundwater Elevation	Groundwater Elevation	List A + Fluoride and TDS, Groundwater Elevation	Groundwater Elevation	List A + Fluoride and TDS, Groundwater Elevation	Groundwater Elevation	List A + calcium, lithium, molybdenum, TDS, TSS, Groundwater Elevation	Groundwater Elevation	List A + calcium, lithium, molybdenum, TDS, TSS, Groundwater Elevation	Groundwat
MW-13															
MW-14															
MW-15R															
MW-16R															
MW-17															
MW-100R															
MW-101R															
MW-102P															
MW-108															
MW-125	Not Installed - Added to program November 2024														List A + calci molybdenu Groundwat
Water Level Only Monitoring Wells															
MW-5	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwat
MW-6															
MW-8															
MW-9P															
MW-9M															
MW-10R															
MW-11R															
MW-102															
MW-102M															
MW-107															
MW-110															
MW-110P															
MW-111															
MW-112															
MW-115															
MW-116															
MW-116P															
MW-116M															
MW-117															
MW-122															
MW-122P															
MW-122M															
Surface Water Monitoring Points															
SW-1R	Water Level	List A + Fluoride and TDS, Water level	Water Level	List A + Fluoride and TDS, Water level	Water Level	List A + Fluoride and TDS, Water level	Water Level	List A + Fluoride and TDS, Water level	Water Level	List A + Fluoride and TDS, Water level	Water Level	List A + Ca, Li, Mo, F, and TDS, Water level	Water Level	List A + Ca, Li, Mo, F, and TDS, Water level	Water
SW-2R															
SW-3															
SW-4															
SW-5															
Other Monitoring Points															
Underdrain Wet Well/Pumping Station (GU-EX)	--	List A + Fluoride and TDS	--	List A + Fluoride and TDS	--	List A + Fluoride and TDS	--	List A + Fluoride and TDS	--	List A + Fluoride and TDS	--	List A + Ca, Li, Mo, Fluoride and TDS	--	List A + Ca, Li, Mo, Fluoride and TDS	--
GU-1 Temp															
GU-2 Temp															
TCB-1/2															
Leachate Wet Well/ Pumping Station (Voluntary)															
Leachate Lagoon (Voluntary)															
LP-1 (Voluntary)	Leachate level measurements attempted during all events; point always dry														

Notes:
(1): List A: Arsenic, barium, beryllium, boron, cobalt, copper, iron, lead, magnesium, manganese, selenium, zinc, sulfate, chloride, field pH, field specific conductance, field temperature, groundwater elevation, and well depth (metals reported as total). Fluoride and total dissolved solids were added in 2014.
(2): Quarterly background monitoring has not been completed at GU-2 Temp because this monitoring point has been dry during most sampling events.
*: The spring 2020 water level measurement event was delayed due to site access restrictions related to the COVID-19 pandemic.
**: MW-1R replaced MW-1 in 2019.

Updated by: RM, 10/7/2025
Checked by: LH, 10/15/2025

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Table 3
Monitoring Well Maintenance and Performance Reevaluation Schedule
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Compliance with:	Monitoring Calendar Years							
	2019	2020	2021	2022	2023	2024	2025	2026
567 IAC 115.21(2)a. high and low water levels (biennial)	Completed		Completed		Completed		Completed	
567 IAC 115.21(2)b. changes in the hydrologic setting and flow paths (biennial)	Completed		Completed		Completed		Completed	
567 IAC 115.21(2)c. well depths (annual)*	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Scheduled
567 IAC 115.21(2)d. in-situ permeability tests (every 5 years)**	Not Applicable - Variance granted by IDNR (see comment below)							

Comments:
*: To avoid the potential for cross-contamination and increased sample turbidity associated with removing and re-installing dedicated pumps, well depths are not measured annually at wells with dedicated pumps.
**: A variance to IAC 567-110.9(2)(d) for in situ permeability tests every 5 years was granted by IDNR in a letter dated April 1, 1999. (Note: Although IAC 567-110 has been rescinded since the variance was granted, the same permeability test requirements are now in IAC 567-115.21(2), and our understanding is that the conditions of the variance still apply.)

Updated by: RM, 10/7/2025
Checked by: LH, 10/15/2025

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Table 4A
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Top of Casing	Top of Screen	Total Depth	Monitoring Parameter	Date of Measurements		Maximum Depth Discrepancy (ft) [1] April	Maximum Depth Discrepancy (ft) [1] August
					April 7-9, 2025	August 5-6, 2025		
MW-1R	823.31	814.01	24.30	Groundwater Level (ft)	9.33	10.17	N/A	N/A
				Groundwater Elevation (Ft MSL)	813.98	813.14		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-5	784.31	737.88	56.43	Groundwater Level (ft)	49.71	50.00	0.12	-0.07
				Groundwater Elevation (Ft MSL)	734.6	734.31		
				Measured Well Depth (ft)	56.31	56.50		
				Submerged screen	N	N		
MW-6	797.03	786.71	25.32	Groundwater Level (ft)	15.28	16.17	-0.72	-0.94
				Groundwater Elevation (Ft MSL)	781.75	780.86		
				Measured Well Depth (ft)	26.04	26.26		
				Submerged screen	N	N		
MW-8	804.96	794.56	20.40	Groundwater Level (ft)	17.72	17.69	0.10	-0.08
				Groundwater Elevation (Ft MSL)	787.24	787.27		
				Measured Well Depth (ft)	20.30	20.48		
				Submerged screen	N	N		
MW-9P	789.78	701.87	92.91	Groundwater Level (ft)	67.31	67.61	1.20	1.20
				Groundwater Elevation (Ft MSL)	722.47	722.17		
				Measured Well Depth (ft)	91.71	91.71		
				Submerged screen	Y	Y		
MW-9M	789.80	638.72	156.08	Groundwater Level (ft)	90.71	90.38	1.10	1.23
				Groundwater Elevation (Ft MSL)	699.09	699.42		
				Measured Well Depth (ft)	154.98	154.85		
				Submerged screen	Y	Y		
MW-10R	788.56	763.06	40.30	Groundwater Level (ft)	30.12	31.2	0.07	0.09
				Groundwater Elevation (Ft MSL)	758.44	757.36		
				Measured Well Depth (ft)	40.23	40.21		
				Submerged screen	N	N		

Table 4A
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Top of Casing	Top of Screen	Total Depth	Monitoring Parameter	Date of Measurements		Maximum Depth Discrepancy (ft) [1] April	Maximum Depth Discrepancy (ft) [1] August
					April 7-9, 2025	August 5-6, 2025		
MW-11R	779.96	764.16	30.80	Groundwater Level (ft)	13.52	13.89	0.24	0.23
				Groundwater Elevation (Ft MSL)	766.44	766.07		
				Measured Well Depth (ft)	30.56	30.57		
				Submerged screen	Y	Y		
MW-12	822.43	701.71	125.72	Groundwater Level (ft)	100.26	100.36	N/A	N/A
				Groundwater Elevation (Ft MSL)	722.17	722.07		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	Y	Y		
MW-13	762.48	724.08	48.40	Groundwater Level (ft)	40.29	40.45	N/A	N/A
				Groundwater Elevation (Ft MSL)	722.19	722.03		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-14	761.02	723.04	47.98	Groundwater Level (ft)	38.85	38.79	N/A	N/A
				Groundwater Elevation (Ft MSL)	722.17	722.23		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-15R	808.49	765.79	57.70	Groundwater Level (ft)	48.13	48.02	N/A	N/A
				Groundwater Elevation (Ft MSL)	760.36	760.47		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-16R	814.13	724.13	105.00	Groundwater Level (ft)	91.85	92.25	N/A	N/A
				Groundwater Elevation (Ft MSL)	722.28	721.88		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-17	760.63	746.01	19.62	Groundwater Level (ft)	19.03	DRY	0.36	N/A
				Groundwater Elevation (Ft MSL)	741.60	NA		
				Measured Well Depth (ft)	19.26	NM		
				Submerged screen	N	N		

Table 4A
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Top of Casing	Top of Screen	Total Depth	Monitoring Parameter	Date of Measurements		Maximum Depth Discrepancy (ft) [1] April	Maximum Depth Discrepancy (ft) [1] August
					April 7-9, 2025	August 5-6, 2025		
MW-100R	822.40	809.65	27.90	Groundwater Level (ft)	14.35	14.19	N/A	N/A
				Groundwater Elevation (Ft MSL)	808.05	808.21		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-101R	799.35	785.35	29.00	Groundwater Level (ft)	16.56	16.95	N/A	N/A
				Groundwater Elevation (Ft MSL)	782.79	782.4		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		
MW-102	797.24	782.80	29.70	Groundwater Level (ft)	19.78	20.97	0.25	0.29
				Groundwater Elevation (Ft MSL)	777.46	776.27		
				Measured Well Depth (ft)	29.45	29.41		
				Submerged screen	N	N		
MW-102P	797.64	700.10	103.20	Groundwater Level (ft)	75.1	75.23	N/A	N/A
				Groundwater Elevation (Ft MSL)	722.54	722.41		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	Y	Y		
MW-102M	798.03	652.65	152.10	Groundwater Level (ft)	90.42	98.19	N/A	N/A
				Groundwater Elevation (Ft MSL)	707.61	699.84		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	Y	Y		
MW-107	788.50	776.75	26.80	Groundwater Level (ft)	22.03	21.6	-0.04	-0.01
				Groundwater Elevation (Ft MSL)	766.47	766.90		
				Measured Well Depth (ft)	26.84	26.81		
				Submerged screen	N	N		
MW-108	765.57	746.62	27.70	Groundwater Level (ft)	24.74	24.46	N/A	N/A
				Groundwater Elevation (Ft MSL)	740.83	741.11		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	N	N		

Table 4A
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Top of Casing	Top of Screen	Total Depth	Monitoring Parameter	Date of Measurements		Maximum Depth Discrepancy (ft) [1] April	Maximum Depth Discrepancy (ft) [1] August
					April 7-9, 2025	August 5-6, 2025		
MW-110	760.39	737.92	37.60	Groundwater Level (ft)	20.68	21.07	0.18	0.08
				Groundwater Elevation (Ft MSL)	739.71	739.32		
				Measured Well Depth (ft)	37.42	37.52		
				Submerged screen	Y	Y		
MW-110P	760.23	689.67	74.80	Groundwater Level (ft)	36.70	36.20	-0.77	-0.36
				Groundwater Elevation (Ft MSL)	723.53	724.03		
				Measured Well Depth (ft)	75.57	75.16		
				Submerged screen	Y	Y		
MW-111	787.38	760.05	42.70	Groundwater Level (ft)	40.33	23.91	0.21	0.11
				Groundwater Elevation (Ft MSL)	747.05	763.47		
				Measured Well Depth (ft)	42.49	42.59		
				Submerged screen	N	Y		
MW-112	811.93	799.55	27.90	Groundwater Level (ft)	24.09	24.17	0.49	0.32
				Groundwater Elevation (Ft MSL)	787.84	787.76		
				Measured Well Depth (ft)	27.41	27.58		
				Submerged screen	N	N		
MW-115	752.44	740.59	27.40	Groundwater Level (ft)	26.32	26.56	0.49	0.50
				Groundwater Elevation (Ft MSL)	726.12	725.88		
				Measured Well Depth (ft)	26.91	26.90		
				Submerged screen	N	N		
MW-116	742.47	729.98	27.70	Groundwater Level (ft)	18.7	19.6	-0.08	-0.06
				Groundwater Elevation (Ft MSL)	723.77	722.87		
				Measured Well Depth (ft)	27.78	27.76		
				Submerged screen	N	N		
MW-116P	742.33	695.7	51.70	Groundwater Level (ft)	19.92	20.27	0.17	-0.47
				Groundwater Elevation (Ft MSL)	722.41	722.06		
				Measured Well Depth (ft)	51.53	52.17		
				Submerged screen	Y	Y		

Table 4A
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Top of Casing	Top of Screen	Total Depth	Monitoring Parameter	Date of Measurements		Maximum Depth Discrepancy (ft) [1] April	Maximum Depth Discrepancy (ft) [1] August
					April 7-9, 2025	August 5-6, 2025		
MW-116M	742.25	640.06	107.20	Groundwater Level (ft)	19.77	19.81	-1.92	-0.05
				Groundwater Elevation (Ft MSL)	722.48	722.44		
				Measured Well Depth (ft)	109.12	107.25		
				Submerged screen	Y	Y		
MW-117	780.77	769.96	28.70	Groundwater Level (ft)	22.18	DRY	1.09	0.92
				Groundwater Elevation (Ft MSL)	758.59	N/A		
				Measured Well Depth (ft)	27.61	27.78		
				Submerged screen	N	N		
MW-122	794.02	765.84	43.80	Groundwater Level (ft)	22.08	22.5	0.30	0.11
				Groundwater Elevation (Ft MSL)	771.94	771.52		
				Measured Well Depth (ft)	43.50	43.69		
				Submerged screen	Y	Y		
MW-122P	794.74	665.65	104.70	Groundwater Level (ft)	72.33	72.41	-0.37	0.03
				Groundwater Elevation (Ft MSL)	722.41	722.33		
				Measured Well Depth (ft)	105.07	104.67		
				Submerged screen	Y	Y		
MW-122M	792.54	642.94	155.30	Groundwater Level (ft)	99.35	115.49	N/A	N/A
				Groundwater Elevation (Ft MSL)	693.19	677.05		
				Measured Well Depth (ft)	NM	NM		
				Submerged screen	Y	Y		
MW-125	785.40	770.40	77.50	Groundwater Level (ft)	63.13	63.06	-0.67	N/A
				Groundwater Elevation (Ft MSL)	722.27	722.34		
				Measured Well Depth (ft)	78.17	NM		
				Submerged screen	N	N		
SW-01R	NA	NA	NA	Surface Water Depth (ft)	DRY	DRY	--	--
SW-02R	NA	NA	NA	Surface Water Depth (ft)	DRY	DRY	--	--
SW-03	NA	NA	NA	Surface Water Depth (ft)	DRY	NM	--	--
SW-04	NA	NA	NA	Surface Water Depth (ft)	DRY	DRY	--	--
SW-05	NA	NA	NA	Surface Water Depth (ft)	DRY	DRY	--	--

Comments:
(1) To avoid the potential for cross-contamination and increased sample turbidity associated with removing and re-installing dedicated pumps, well depths are not measured annually at wells with dedicated pumps. Depths are checked when pumps are pulled for maintenance or replacement.
(2) Measurement at MW-17 in August 2025 not recorded.

Updated by: RM Date: 10/9/2025
Checked by: LH Date: 10/15/2025

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Table 4B
Vertical Gradients
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

	Well Pair		Vertical Hydraulic Gradient (feet/foot)[1]	
	Shallower Well	**Deeper Well**	**April 2025**	**August 2025**
Water Table & Pennsylvanian Wells	MW-1R	MW-12	-0.856	-0.852
	MW-10R	MW-9P	-0.666	-0.658
	MW-102	MW-102P	-0.727	-0.718
	MW-110	MW-110P	-0.373	-0.355
	MW-116	MW-116P	-0.052	-0.032
	MW-122	MW-122P	-0.723	-0.720
Pennsylvanian & Mississippian Wells	MW-9P	MW-9M	-0.370	-0.360
	MW-102P	MW-102M	-0.319	-0.482
	MW-116P	MW-116M	0.001	0.007
	MW-122P	MW-122M	-0.561	-0.869

Comment:
(1) A negative value indicates a downward gradient; a positive value indicates an upward gradient.

Updated by: RM Date: 10/9/2025
Checked by: LH Date: 10/15/2025

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Table 5
Background Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Interwell Background								
Constituent	**Units**	**Samples**	**Detections**	**UPL**	**Statistical Test**	**GWPS**	**Source**	**Other Standards**
Shallow Hydrogeologic Unit - MW-1/MW-1R								
Field pH	SU	9	9	N/A	N/A	none	--	SMCL <6.5 or >8.5
Field Temperature	deg C	9	9	N/A	N/A	none	--	--
Field Specific Conductance	µmhos/cm	9	9	N/A	N/A	none	--	--
Field Oxidation Potential	mV	3	3*	N/A	N/A	none	--	--
Dissolved Oxygen	mg/L	3	3*	N/A	N/A	none	--	--
Arsenic	µg/l	9	1	0.880	PL(NP)	10	MCL	--
Barium	µg/l	9	9	88	PL(P)	2,000	MCL	--
Beryllium	µg/l	9	1	DQ	DQ	4	MCL	--
Boron	µg/l	9	5	120	PL(P)	6,000	SWS	--
Calcium	mg/L	3	3	N/A	N/A	none	--	--
Cobalt	µg/l	9	3	0.370	PL(NP)	2.1	SWS	--
Copper	µg/l	9	3	3.20	PL(NP)	1,300	SWS	SMCL 1,000
Iron	µg/l	9	5	606	PL(P)	none	--	SMCL 300
Lead	µg/l	9	4	0.900	PL(NP)	15	SWS	--
Lithium	µg/l	3	3	N/A	N/A	14	SWS	--
Magnesium	µg/l	9	9	48,100	PL(NP)	none	--	--
Manganese	µg/l	9	4	20.0	PL(NP)	300	SWS	SWS 300, SMCL 50
Molybdenum	µg/l	3	3	N/A	N/A	40	SWS	--
Selenium	µg/l	9	6	2.76	PL(P)	50	MCL	--
Zinc	µg/l	9	1	13.0	PL(NP)	2,000	SWS	SMCL 5,000
Chloride	mg/L	9	9	224	PL(P)	none	--	SMCL 250
Fluoride	mg/L	9	8	0.911	PL(P)	4.00	MCL	SMCL 2
Sulfate	mg/L	9	9	448	PL(P)	none	--	SMCL 250
Total Dissolved Solids	mg/L	9	9	957	PL(P)	none	--	SMCL 500
Total Suspended Solids	mg/L	3	3	N/A	N/A	none	--	--

Table 5
Background Summary
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Interwell Background								
Constituent	**Units**	**Samples**	**Detections**	**UPL**	**Statistical Test**	**GWPS**	**Source**	**Other Standards**
Pennsylvanian Shale Hydrogeologic Unit - MW-102P								
Field pH	SU	9	9	N/A	N/A	none	--	SMCL <6.5 or >8.5
Field Temperature	deg C	9	9	N/A	N/A	none	--	--
Field Specific Conductance	µmhos/cm	9	9	N/A	N/A	none	--	--
Field Oxidation Potential	mV	3	3*	N/A	N/A	none	--	--
Dissolved Oxygen	mg/L	3	3*	N/A	N/A	none	--	--
Arsenic	µg/l	9	2	0.880	PL(NP)	10	MCL	--
Barium	µg/l	9	9	28.1	PL(P)	2,000	MCL	--
Beryllium	µg/l	9	1	1.30	PL(NP)	4	MCL	--
Boron	µg/l	9	9	2,130	PL(P)	6,000	SWS	--
Calcium	mg/L	3	3	N/A	N/A	none	--	--
Cobalt	µg/l	9	9	1.64	PL(P)	2.1	SWS	--
Copper	µg/l	9	3	4.30	PL(NP)	1,300	SWS	SMCL 1,000
Iron	µg/l	9	9	5,500	PL(NP)	none	--	SMCL 300
Lead	µg/l	9	2	1.10	PL(NP)	15	SWS	--
Lithium	µg/l	3	3	N/A	N/A	14	SWS	--
Magnesium	µg/l	9	9	198,000	PL(P)	none	--	--
Manganese	µg/l	9	9	574	PL(NP)	574	Background	SWS 300, SMCL 50
Molybdenum	µg/l	3	1	N/A	N/A	40	SWS	--
Selenium	µg/l	9	0	DQ	DQ	50	MCL	--
Zinc	µg/l	9	6	25.5	PL(P)	2,000	SWS	SMCL 5,000
Chloride	mg/L	9	9	9.90	PL(P)	none	--	SMCL 250
Fluoride	mg/L	9	7	1.02	PL(P)	4.00	MCL	SMCL 2
Sulfate	mg/L	9	9	2,200	PL(P)	none	--	SMCL 250
Total Dissolved Solids	mg/L	9	9	3,460	PL(P)	none	--	SMCL 500
Total Suspended Solids	mg/L	3	3	N/A	N/A	none	--	--

PL(NP) - Prediction Limit (Non-Parametric)
PL(P) - Prediction Limit (Parametric)
MCL - Maximum Contaminant Level

SWS - Statewide Standard for Groundwater
SMCL - Secondary Maximum Contaminant Level
GWPS - Groundwater Protection Standard

DQ - Double Quantitation

Notes:

* = Field parameters ORP and DO have been collected historically as part of stability requirements for low-flow sampling, but were not reported in AWQRs prior to 2023.

Updated by: RM Date: 10/7/2025
Checked by: LH Date: 10/17/2025

I:\25225073.00\Deliverables\2025 OML AWQR\Tables\[AWQR_OML_Tables.xlsx]5 - Background & GWPS summary

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-1R*	Field pH	SU	6.93	N/A
	Field Temperature	deg C	18.8	N/A
	Field Specific Conductance	µmhos/cm	792	N/A
	Field Oxidation Potential	mV	263.3	N/A
	Dissolved Oxygen	mg/L	2.07	N/A
	Arsenic	µg/l	<0.53	N/A
	Barium	µg/l	67	N/A
	Beryllium	µg/l	<0.33	N/A
	Boron	µg/l	100	N/A
	Calcium	mg/L	84	N/A
	Cobalt	µg/l	<0.17	N/A
	Copper	µg/l	<3.2	N/A
	Iron	µg/l	<50	N/A
	Lead	µg/l	<0.33	N/A
	Lithium	µg/l	29	N/A
	Magnesium	µg/l	31000	N/A
	Manganese	µg/l	<3.6	N/A
	Molybdenum	µg/l	1.7 J	N/A
	Selenium	µg/l	1.4 J	N/A
	Zinc	µg/l	<13	N/A
	Chloride	mg/L	25	N/A
	Fluoride	mg/L	0.53 J	N/A
	Sulfate	mg/L	57	N/A
	Total Dissolved Solids	mg/L	470	N/A
	Total Suspended Solids	mg/L	1.3 J	N/A
MW-12	Field pH	SU	7.23	N/A
	Field Temperature	deg C	32.5	N/A
	Field Specific Conductance	µmhos/cm	2434	N/A
	Field Oxidation Potential	mV	188	N/A
	Dissolved Oxygen	mg/L	7.64	N/A
	Arsenic	µg/l	<0.53	0.88
	Barium	µg/l	17	28.1
	Beryllium	µg/l	<0.33	DQ
	Boron	µg/l	1,300	2130
	Calcium	mg/L	13	N/A
	Cobalt	µg/l	<0.17	0.37
	Copper	µg/l	3.8 J	3.2
	Iron	µg/l	380	606
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	110	N/A
	Magnesium	µg/l	5900	198000
	Manganese	µg/l	26	574
	Molybdenum	µg/l	1.4 J	N/A
	Selenium	µg/l	<1.4	DQ
	Zinc	µg/l	<13	13
	Sulfate	mg/L	800	2200
	Total Dissolved Solids	mg/L	1700	3460
	Total Suspended Solids	mg/L	<1.3	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-13	Field pH	SU	7.00	N/A
	Field Temperature	deg C	17.6	N/A
	Field Specific Conductance	µmhos/cm	3285	N/A
	Field Oxidation Potential	mV	-2.7	N/A
	Dissolved Oxygen	mg/L	0.28	N/A
	Arsenic	µg/l	<0.53	0.88
	Barium	µg/l	17	28.1
	Beryllium	µg/l	<0.33	DQ
	Boron	µg/l	1,900	2130
	Calcium	mg/L	100	N/A
	Cobalt	µg/l	1.2	1.64
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	250	606
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	170	N/A
	Magnesium	µg/l	64000	198000
	Manganese	µg/l	210	574
	Molybdenum	µg/l	<1.3	N/A
	Selenium	µg/l	<1.4	2.76
	Zinc	µg/l	<13	13
	Fluoride	mg/L	0.85 J	1.02
	Sulfate	mg/L	1600	2200
	Total Dissolved Solids	mg/L	2,200	3460
	Total Suspended Solids	mg/L	<1.3	N/A
MW-14	Field pH	SU	7.03	N/A
	Field Temperature	deg C	16.5	N/A
	Field Specific Conductance	µmhos/cm	2917	N/A
	Field Oxidation Potential	mV	177.2	N/A
	Dissolved Oxygen	mg/L	0.97	N/A
	Arsenic	µg/l	1.2 J	0.88
	Barium	µg/l	21	28.1
	Beryllium	µg/l	<0.33	DQ
	Boron	µg/l	1,900	2130
	Calcium	mg/L	63	N/A
	Cobalt	µg/l	0.54	1.64
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	<50	606
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	140	N/A
	Magnesium	µg/l	35,000	198000
	Manganese	µg/l	140	574
	Molybdenum	µg/l	15	N/A
	Selenium	µg/l	2.2 J	2.76
	Zinc	µg/l	<13	13
	Fluoride	mg/L	0.88 J	1.02
	Sulfate	mg/L	870	2200
	Total Dissolved Solids	mg/L	2000	3460
	Total Suspended Solids	mg/L	2.0	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-15R	Field pH	SU	6.18	N/A
	Field Temperature	deg C	22.2	N/A
	Field Specific Conductance	µmhos/cm	2221	N/A
	Field Oxidation Potential	mV	70.5	N/A
	Dissolved Oxygen	mg/L	0.67	N/A
	Arsenic	µg/l	<0.53	0.88
	Barium	µg/l	31	88
	Beryllium	µg/l	<0.33	DQ
	Calcium	mg/L	260	N/A
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	480	606
	Lead	µg/l	<0.33	0.9
	Lithium	µg/l	69	N/A
	Molybdenum	µg/l	5.0	N/A
	Selenium	µg/l	<1.4	2.76
	Zinc	µg/l	<13	13
	Chloride	mg/L	10	224
	Fluoride	mg/L	<0.38	0.911
	Sulfate	mg/L	440	448
	Total Suspended Solids	mg/L	1.8 J	N/A
MW-16R	Field pH	SU	6.83	N/A
	Field Temperature	deg C	15.0	N/A
	Field Specific Conductance	µmhos/cm	3093	N/A
	Field Oxidation Potential	mV	7.2	N/A
	Dissolved Oxygen	mg/L	0.29	N/A
	Arsenic	µg/l	<0.53	0.88
	Beryllium	µg/l	<0.33	DQ
	Boron	µg/l	1,900	2130
	Calcium	mg/L	65	N/A
	Cobalt	µg/l	0.82	1.64
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	490	5500
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	110	N/A
	Magnesium	µg/l	38,000	198000
	Manganese	µg/l	220	574
	Molybdenum	µg/l	<1.3	N/A
	Selenium	µg/l	<1.4	DQ
	Zinc	µg/l	<13	13
	Fluoride	mg/L	0.60 J	1.02
	Sulfate	mg/L	900	2200
	Total Dissolved Solids	mg/L	2100	3460
	Total Suspended Solids	mg/L	1.6 J	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-17	Field pH	SU	NA	N/A
	Field Temperature	deg C	NA	N/A
	Field Specific Conductance	µmhos/cm	NA	N/A
	Field Oxidation Potential	mV	NA	N/A
	Dissolved Oxygen	mg/L	NA	N/A
	Arsenic	µg/l	NA	0.88
	Barium	µg/l	NA	88
	Beryllium	µg/l	NA	DQ
	Boron	µg/l	NA	120
	Calcium	mg/L	NA	N/A
	Cobalt	µg/l	NA	0.37
	Copper	µg/l	NA	3.2
	Iron	µg/l	NA	606
	Lead	µg/l	NA	0.9
	Lithium	µg/l	NA	N/A
	Magnesium	µg/l	NA	48,100
	Manganese	µg/l	NA	20
	Molybdenum	µg/l	NA	N/A
	Selenium	µg/l	NA	2.76
	Zinc	µg/l	NA	13
	Chloride	mg/L	NA	224
	Fluoride	mg/L	NA	0.911
	Sulfate	mg/L	NA	448
	Total Dissolved Solids	mg/L	NA	957
	Total Suspended Solids	mg/L	NA	N/A
MW-100R	Field pH	SU	7.14	N/A
	Field Temperature	deg C	22.5	N/A
	Field Specific Conductance	µmhos/cm	963	N/A
	Field Oxidation Potential	mV	191.7	N/A
	Dissolved Oxygen	mg/L	4.31	N/A
	Arsenic	µg/l	0.55 J	0.88
	Barium	µg/l	41	88
	Beryllium	µg/l	<0.33	DQ
	Boron	µg/l	<82	120
	Calcium	mg/L	120	N/A
	Cobalt	µg/l	<0.17	0.37
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	<50	606
	Lead	µg/l	<0.33	0.9
	Lithium	µg/l	20	N/A
	Magnesium	µg/l	40000	48,100
	Manganese	µg/l	<3.6	20
	Molybdenum	µg/l	2.3	N/A
	Selenium	µg/l	<1.4	2.76
	Zinc	µg/l	<13	13
	Chloride	mg/L	27	224
	Fluoride	mg/L	0.46 J	0.911
	Sulfate	mg/L	170	448
	Total Dissolved Solids	mg/L	640	957
	Total Suspended Solids	mg/L	<1.3	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-101R	Field pH	SU	6.82	N/A
	Field Temperature	deg C	14.4	N/A
	Field Specific Conductance	µmhos/cm	1,432	N/A
	Field Oxidation Potential	mV	179	N/A
	Dissolved Oxygen	mg/L	0.38	N/A
	Arsenic	µg/l	<0.53	0.88
	Barium	µg/l	43	88
	Beryllium	µg/l	<0.33	DQ
	Calcium	mg/L	180	N/A
	Cobalt	µg/l	0.44 J	0.37
	Copper	µg/l	<3.2	3.2
	Iron	µg/l	200	606
	Lead	µg/l	<0.33	0.9
	Lithium	µg/l	78	N/A
	Molybdenum	µg/l	6.4	N/A
	Selenium	µg/l	2.8 J	2.76
	Zinc	µg/l	<13	13
	Chloride	mg/L	6.5	224
	Fluoride	mg/L	0.44 J	0.911
	Total Suspended Solids	mg/L	9.9	N/A
MW-102P*	Field pH	SU	6.38	N/A
	Field Temperature	deg C	18.9	N/A
	Field Specific Conductance	µmhos/cm	2857	N/A
	Field Oxidation Potential	mV	30.8	N/A
	Dissolved Oxygen	mg/L	1.9	N/A
	Arsenic	µg/l	<0.53	N/A
	Barium	µg/l	26	N/A
	Beryllium	µg/l	<0.33	N/A
	Boron	µg/l	1500	N/A
	Calcium	mg/L	330	N/A
	Cobalt	µg/l	1.3	N/A
	Copper	µg/l	<3.2	N/A
	Iron	µg/l	3300	N/A
	Lead	µg/l	<0.33	N/A
	Lithium	µg/l	190	N/A
	Magnesium	µg/l	140000	N/A
	Manganese	µg/l	340	N/A
	Molybdenum	µg/l	<1.3	N/A
	Selenium	µg/l	<1.4	N/A
	Zinc	µg/l	18 J	N/A
	Chloride	mg/L	9.7	N/A
	Fluoride	mg/L	0.69 J	N/A
	Sulfate	mg/L	1300	N/A
	Total Dissolved Solids	mg/L	2300	N/A
	Total Suspended Solids	mg/L	8.3	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-108	Field pH	SU	6.48	N/A
	Field Temperature	deg C	16.8	N/A
	Field Specific Conductance	µmhos/cm	599	N/A
	Field Oxidation Potential	mV	-20.6	N/A
	Dissolved Oxygen	mg/L	0.37	N/A
	Barium	µg/l	34	88
	Beryllium	µg/l	<0.33	DQ
	Calcium	mg/L	65	N/A
	Copper	µg/l	<3.2	3.2
	Lead	µg/l	<0.33	0.9
	Lithium	µg/l	47	N/A
	Magnesium	µg/l	16,000	48,100
	Molybdenum	µg/l	2.5	N/A
	Selenium	µg/l	<1.4	2.76
	Chloride	mg/L	2.8 J	224
	Fluoride	mg/L	0.50 J	0.911
	Sulfate	mg/L	140	448
	Total Dissolved Solids	mg/L	380	957
	Total Suspended Solids	mg/L	1.3 J	N/A
MW-125 (April 2025)	Field pH	SU	6.64	N/A
	Field Temperature	deg C	12.9	N/A
	Field Specific Conductance	µmhos/cm	2893	N/A
	Field Oxidation Potential	mV	102.8	N/A
	Dissolved Oxygen	mg/L	1.21	N/A
	Arsenic	µg/l	0.71 J	0.88
	Beryllium	µg/l	<0.33	1.3
	Boron	µg/l	2100	2130
	Calcium	mg/L	88	N/A
	Cobalt	µg/l	1.2	1.64
	Copper	µg/l	<3.2	4.3
	Iron	µg/l	1500	5500
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	150	N/A
	Magnesium	µg/l	45000	198000
	Manganese	µg/l	340	574
	Molybdenum	µg/l	<1.3	N/A
	Selenium	µg/l	<1.4	DQ
	Zinc	µg/l	<13	25.5
	Fluoride	mg/L	0.74 J	1.02
	Sulfate	mg/L	440	2200
	Total Dissolved Solids	mg/L	1900	3460
	Total Suspended Solids	mg/L	49	N/A

Table 6
Summary of Well/Detected Constituent Pairs With No SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL
MW-125 (August 2025)	Field pH	SU	6.65	N/A
	Field Temperature	deg C	16.4	N/A
	Field Specific Conductance	µmhos/cm	2929	N/A
	Field Oxidation Potential	mV	28.1	N/A
	Dissolved Oxygen	mg/L	0.25	N/A
	Arsenic	µg/l	<0.53	0.88
	Beryllium	µg/l	<0.33	1.3
	Boron	µg/l	2000	2130
	Calcium	mg/L	84	N/A
	Cobalt	µg/l	0.53	1.64
	Copper	µg/l	<3.2	4.3
	Iron	µg/l	740	5500
	Lead	µg/l	<0.33	1.1
	Lithium	µg/l	160	N/A
	Magnesium	µg/l	44000	198000
	Manganese	µg/l	190	574
	Molybdenum	µg/l	<1.3	N/A
	Selenium	µg/l	<1.4	DQ
	Zinc	µg/l	<13	25.5
	Fluoride	mg/L	0.65 J	1.02
	Sulfate	mg/L	460	2200
	Total Dissolved Solids	mg/L	2000	3460
	Total Suspended Solids	mg/L	3.8	N/A

UPL = Upper Prediction Limit
SSI = Statistically Significant Increase
ND = Non-detect
J = Estimated concentration at or above the LOD and below the LOQ.
DQ = Double Quantitation

mg/= milligrams per liter
µg/L = micrograms per liter

Comments:
1. This table provides a summary of detected constituents from the 2025 sampling event that did not exceed the UPL in 2025. The background levels listed are interwell prediction limits calculated using MW-1/1R data for the shallow aquifer and MW-102P data for the Pennsylvanian unit. UPLs were first calculated in 2020 using data from 2017 through 2020, and were updated annually from 2022 through 2025.
2. Results below the limit of quantitation (J flags) are estimated values and are not compared to the UPL or GWPS. They are included in this table regardless of whether the estimated value is higher or lower than the UPL.

3. MW-17 was dry during the August 2025 sampling event.

*. UPLs do not apply to MW-1R and MW-102P because they are background wells.

Updated by: RM Date: 10/9/2025
Checked by: LH Date: 10/16/2025

Table 7
Summary of Ongoing and Newly Identified SSIs
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Constituent	Units	Most Recent Result	UPL	Action Level (GWPS)
Shallow Hydrogeologic Unit					
MW-15R	Boron	µg/l	550	120	6000
	Cobalt	µg/l	2.8	0.37	2.1
	Lithium	µg/l	69	N/A	14
	Magnesium	µg/l	120000	48100	none
	Manganese	µg/l	570	20	300
	Total Dissolved Solids	mg/L	1400	957	none
MW-100R	Lithium	µg/l	20	N/A	14
MW-101R	Boron	µg/l	750	120	6000
	Lithium	µg/l	78	N/A	14
	Magnesium	µg/l	68000	48100	none
	Manganese	µg/l	160	20	300
	Sulfate	mg/L	480	448	none
	Total Dissolved Solids	mg/L	1000	957	none
MW-108	Arsenic	µg/l	3.4	0.88	10
	Boron	µg/l	320	120	6000
	Cobalt	µg/l	4.2	0.37	2.1
	Iron	µg/l	3800	606	none
	Lithium	µg/l	47	N/A	14
	Manganese	µg/l	790	20	300
	Zinc	µg/l	46	13	2000
MW-1R*	Lithium	µg/l	29	N/A	14
Mid-Depth (Pennsylvanian) Hydrogeologic Unit					
MW-12	Chloride	mg/L	48	9.90	none
	Fluoride	mg/L	2.6	1.02	4
	Lithium	µg/l	110	N/A	14
MW-13	Chloride	mg/L	13	9.90	none
	Lithium	µg/l	170	N/A	14
MW-14	Chloride	mg/L	20	9.90	none
	Lithium	µg/l	140	N/A	14
MW-16R	Barium	µg/l	37	28.1	2000
	Chloride	mg/L	21	9.90	none
	Lithium	µg/l	110	N/A	14
MW-102P*	Lithium	µg/l	190	N/A	14
MW-125 (April 2025)	Barium	µg/l	91	28	2000
	Chloride	mg/L	17	10	none
	Lithium	µg/l	150	N/A	14
MW-125 (August 2025)	Barium	µg/l	67	28	2000
	Chloride	mg/l	16	9.9	none
	Lithium	µg/l	160	N/A	14

UPL = Upper Prediction Limit
GWPS = Groundwater Protection Standard
mg/= milligrams per liter
µg/L = micrograms per liter

Comments:
1. This table includes results for wells/constituents that exceeded the UPL in 2025, which is the fifth year for which UPLs were calculated.
2. Results below the limit of quantitation (J flags) are estimated values and are not compared to the UPL or GWPS.

*. MW-1R and MW-102P are the upgradient wells for the shallow and Pennsylvanian units, respectively.

Updated by: RM Date: 10/9/2025
Checked by: LH Date: 10/16/2025

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Table 8
Historic SSIs & GWPS Exceedances
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Key: gray =UPL; black =action level (GWPS)										
Well	**Constituent**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Shallow Hydrogeologic Unit										
MW-1R	Lithium*									
MW-15R	Boron									
	Cobalt									
	Iron									
	Lithium*									
	Magnesium									
	Manganese									
	Zinc									
	Sulfate									
	Total Dissolved Solids									
MW-17	Boron						Dry in August 2022 - not sampled	Dry in August 2023 - not sampled	Dry in August 2024 - not sampled	Dry in August 2025 - not sampled
	Cobalt									
	Manganese									
MW-100R	Lithium*									
MW-101R	Boron									
	Lithium*									
	Magnesium									
	Manganese									
	Selenium									
	Sulfate									
	Total Dissolved Solids									
MW-108	Arsenic									
	Boron									
	Cobalt									
	Iron									
	Lithium*									
	Manganese									
	Zinc									
Pennsylvanian Hydrogeologic Unit										
MW-12	Chloride									
	Fluoride									
	Lithium*									
MW-13	Chloride									
	Lithium*									
MW-14	Arsenic									
	Chloride									
	Lithium*									
MW-16R	Barium									
	Chloride									
	Lithium*									
MW-102P	Lithium*									
MW-125**	Barium									
	Chloride									
	Lithium*									

Abbreviations:
UPL = Upper Prediction Limit
GWPS = Groundwater Protection Standard
SSI = Statistically Significant Increase

1: UPLs were calculated annually beginning in 2020 when at least four sampling events with unfiltered (total) data. UPLs are only applied to results from 2020 onwards in this table.
*: Lithium was added to the sampling program in 2023. UPLs will be generating once the minimum of four sampling rounds are complete.
**:MW-125 was installed in 2024 and sampled in April and August 2025. This table includes exceedances from both events in 2025.

Updated by: RM Date: 10/10/2025
Checked by: LH Date: 10/16/2025

I:\25225073.00\Deliverables\2025 OML AWQR\Tables\[AWQR_OML_Tables.xlsx]8 - Historic CL & AL

Table 9
Historic Prediction Limits and Groundwater Protection Standards
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

		UPL						GWPS					
Constituent	**Units**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Shallow Hydrogeological Units													
Arsenic	mg/L	0.880	0.880	0.880	0.880	0.880	0.880	10	10	10	10	10	10
Barium	µg/L	125	109	99.7	95.6	90.1	88.0	2,000	2,000	2,000	2,000	2,000	2,000
Beryllium	µg/L	0.270	0.270	DQ	DQ	DQ	DQ	4	4	4	4	4	4
Boron	µg/L	287	256	198	129	116	120	6,000	6,000	6,000	6,000	6,000	6,000
Cobalt	mg/L	1.10	0.799	0.37	0.37	0.37	0.37	2.10	2.10	2.10	2.10	2.10	2.10
Copper	mg/L	4.74	3.80	2.10	2.10	2.10	3.20	1,300	1,300	1,300	1,300	1,300	1,300
Iron	µg/L	1,140	840	4,000	665	931	606	none	none	none	none	none	none
Lead	µg/L	2.62	2.04	0.90	1.32	1.58	0.90	15.00	15.00	15.00	15.00	15.00	15.00
Magnesium	µg/L	135,000	48,100	48,100	48,100	48,100	48,100	none	none	none	none	none	none
Manganese	mg/L	59.00	391	85.50	33.00	24.70	20.00	300	391	300	300	300	300
Selenium	µg/L	4.42	3.48	2.87	3.45	2.98	2.76	50.00	50.00	50.00	50.00	50.00	50.00
Zinc	µg/L	10.0	10.0	10.0	10.0	10.0	13.0	2,000	2,000	2,000	2,000	2,000	2,000
Chloride	mg/L	180	335	178	287	298	224	none	none	none	none	none	none
Fluoride	µg/L	1.47	1.21	1.16	1.10	0.97	0.91	4	4	4	4	4	4
Sulfate	mg/L	482	482	485	483	459	448	none	none	none	none	none	none
Total Dissolved Solids	µg/L	1,600	1,350	1,240	1,130	1,020	957	none	none	none	none	none	none
Pennsylvanian Shale Hydrogeologic Unit													
Arsenic	mg/L	0.880	0.880	0.880	0.880	0.880	0.880	10	10	10	10	10	10
Barium	µg/L	32.1	29.9	29.9	28.0	27.8	28.1	2,000	2,000	2,000	2,000	2,000	2,000
Beryllium	µg/L	0.270	0.270	0.270	1.300	1.300	1.300	4	4	4	4	4	4
Boron	µg/L	3,090	2,690	2,400	2,190	2,180	2,130	6,000	6,000	6,000	6,000	6,000	6,000
Cobalt	mg/L	2.24	1.87	1.89	1.60	1.62	1.64	2.24	2.1	2.1	2.1	2.1	2.1
Copper	mg/L	2.00	2.00	2.00	2.70	4.30	4.30	1,300	1,300	1,300	1,300	1,300	1,300
Iron	µg/L	6,140	6,040	5,500	5,500	5,500	5,500	none	none	none	none	none	none
Lead	µg/L	1.10	1.10	1.10	1.10	1.10	1.10	15.00	15.00	15.00	15.00	15.00	15.00
Magnesium	µg/L	205,000	193,000	225,000	206,000	204,000	198,000	none	none	none	none	none	none
Manganese	mg/L	627	662	574	755	574	574	627	662	755	574	574	574
Selenium	µg/L	1.00	0.96	DQ	DQ	DQ	DQ	50	50	50	50	50	50
Zinc	µg/L	40.00	40.00	40.00	23.10	23.70	25.50	2,000	2,000	2,000	2,000	2,000	2,000
Chloride	mg/L	9.68	9.60	9.70	9.63	9.77	9.90	none	none	none	none	none	none
Fluoride	µg/L	1.80	1.53	1.44	1.06	1.07	1.02	4	4	4	4	4	4
Sulfate	mg/L	2,300	2,260	2,410	2,200	2,230	2,200	none	none	none	none	none	none
Total Dissolved Solids	µg/L	3,670	3,650	3,950	3,510	3,100	3,460	none	none	none	none	none	none

Comments: Graphs were not generated in 2025 due to the small number of events completed to date (2020 was first year for UPL calculations).
DQ: Double Quantitation

Updated by: RM, 10/7/2025
Checked by: LH, 10/16/2025

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Table 10
Groundwater Quality Trend Summary
2024 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

Well	Current GWPS Exceedances	Trend
MW-15R	Cobalt	No significant trend
	Manganese	Significant decreasing trend
MW-108	Cobalt	Significant decreasing trend
	Manganese	Significant decreasing trend

Comments:
Only well/constituent pairs with GWPS exceedances are included in this summary.

Updated by: RM, 10/10/2025
Checked by: LH, 10/16/2025

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Table 11
Data Analytical Summary - Additional Points
2025 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	GWPS	GWPS SOURCE	EVENT	GU-1 TEMP	GU-2	GU-EX	LP-1	SW-1R	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	TCB-1/2
ARSENIC, µg/L	10	MCL	2025-Aug	<0.53		1.1 J				3.6			13	0.90 J
BARIUM, µg/L	2,000	MCL	2025-Aug	34 B		46 B				72 B			61 B	65 B
BERYLLIUM, µg/L	4	MCL	2025-Aug	<0.33		<0.33				<0.33			<0.33	<0.33
BORON, µg/L	6,000	SWS	2025-Aug	300		820				700			2,000	430
CALCIUM, mg/L	--	--	2025-Aug	200		110				68			200	110
COBALT, µg/L	2.1	SWS	2025-Aug	6.0		0.64				0.30 J			0.32 J	0.85
COPPER, µg/L	1,300	SWS	2025-Aug	<3.2		<3.2				<3.2			<3.2	<3.2
FLUORIDE, mg/L	4	MCL	2025-Aug	0.52 J		0.45 J				0.48 J			<0.38	<0.38
IRON, µg/L	--	--	2025-Aug	<50		240				170			<50	340
LEAD, µg/L	15	SWS	2025-Aug	<0.33		<0.33				<0.33			<0.33	<0.33
LITHIUM, µg/L	14	SWS	2025-Aug	46		17				8.1 J			24	<2.9
MAGNESIUM, µg/L	--	--	2025-Aug	61000		38000				30000			26000	15000
MANGANESE, µg/L	300	SWS	2025-Aug	1700	DRY	110	DRY	DRY	DRY	28	DRY	DRY	25	8.5 J
MOLYBDENUM, µg/L	40	SWS	2025-Aug	2.1		35				11			560	4.4
SELENIUM, µg/L	50	MCL	2025-Aug	<1.4		4.4 J				<1.4			46	<1.4
ZINC, µg/L	2000	SWS	2025-Aug	31		<13				<13			25	<13
CHLORIDE, mg/L	--	--	2025-Aug	20		22				12			450	14
SULFATE, mg/L	--	--	2025-Aug	410		530				340			2,000	370
TOTAL DISSOLVED SOLIDS, mg/L	--	--	2025-Aug	1100		880				580			3,200	590
TOTAL SUSPENDED SOLIDS, mg/L	--	--	2025-Aug	<1.3		13				38			160	1.4 J
pH, SU	--	--	2025-Aug	6.76		7.34				7.8			8.23	8.70
TEMPERATURE, DEGREES C	--	--	2025-Aug	21.5		23.1				27.4			29.9	27.8
SPECIFIC CONDUCTANCE, UMHOS/CM	--	--	2025-Aug	1422		1238				--(1)			4,497	809
FIELD OXIDATION POTENTIAL, mV	--	--	2025-Aug	172		188.5				--(1)			--(1)	118.4
DISSOLVED OXYGEN, mg/L	--	--	2025-Aug	8.86		7.00				--(1)			--(1)	9.26

Notes:
MCL = Maximum Contaminant Level
SWS = Statewide Standard for Groundwater
-- = Not Applicable
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
(1): Parameter not recorded by field staff at the time of the August 2025 sampling.

Updated by: RM Date: 10/7/2025
Checked by: LH Date: 10/16/2025

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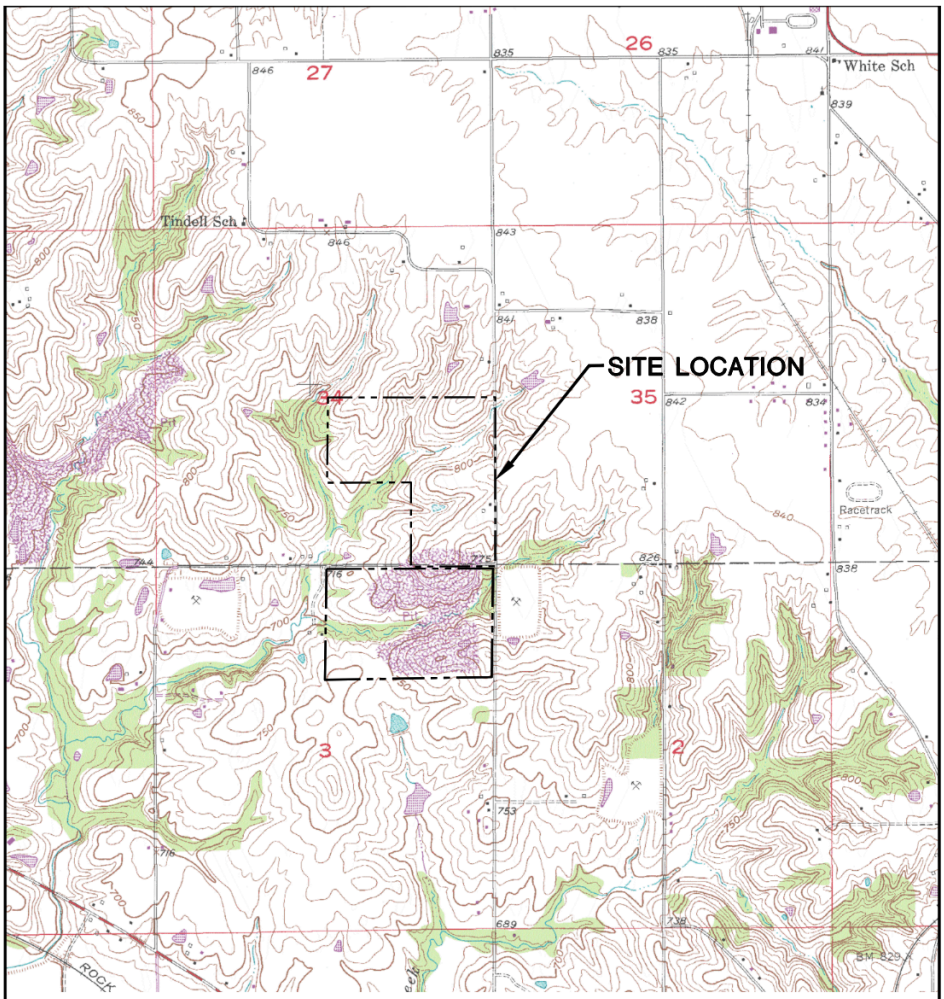
Figures



LEGEND

APPROXIMATE PROPERTY LINE

OTTUMWA NORTH QUADRANGLE
IOWA–WAPELLO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 OTTUMWA NORTH 15' QUADRANGLE
1976
SCALE: 1" = 2,000'

N

CLIENT: INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501	SITE: OTTUMWA MIDLAND LANDFILL OTTUMWA, IOWA	SITE LOCATION MAP	
PROJECT NO. 25216073.00	DRAWN BY: KP	ENGINEER: SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE 1
DRAWN: 09/15/11	CHECKED BY: MB		
REVISED: 11/17/16	APPROVED BY: TK 11/21/17		

I:\25216073.00\Drawings\FIG 1 Site Location.dwg, 11/21/2017 3:30:42 PM

PROJECT NO.	25225073.00	DRAWN BY:	SB
DRAWN:	10/28/2025	CHECKED BY:	NLB, 10/28/2025
REVISED:	10/28/2025	APPROVED BY:	TK, 11/20/2025

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT CO.
15300 130th STREET
OTTUMWA, IA 52501

SITE: OTTUMWA MIDLAND LANDFILL
OTTUMWA, IOWA

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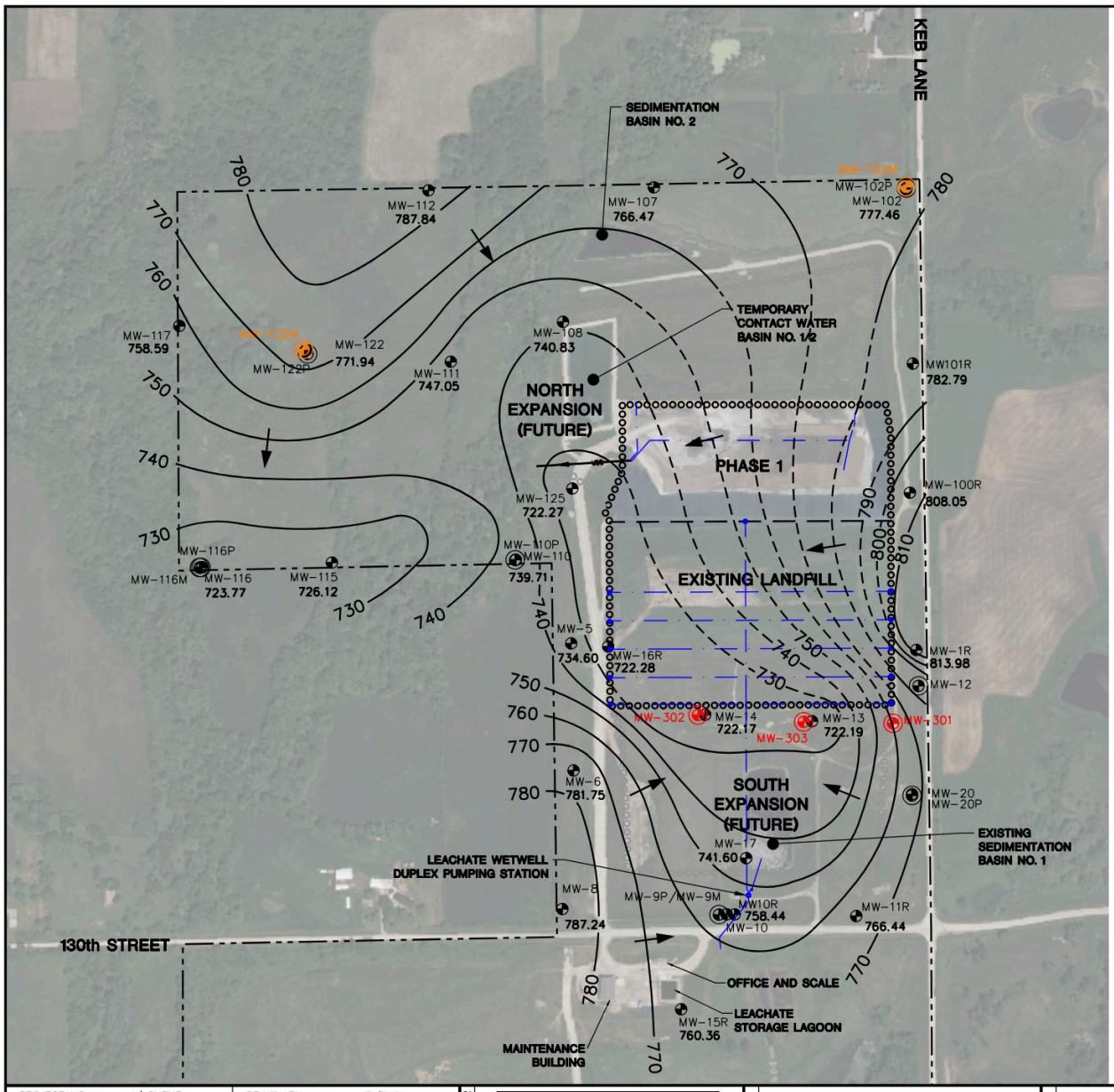

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NOTES:

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PROJECT NO.	I:\CLIENT	DRAWN BY:	KP/RVG	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501	SITE	OTTUMWA MIDLAND LANDFILL OTTUMWA, IOWA
DRAWN:	04/23/2025	CHECKED BY:	NLB 10/16/2025						
REVISED:	10/23/2025	APPROVED BY:	TK 11/20/2025						

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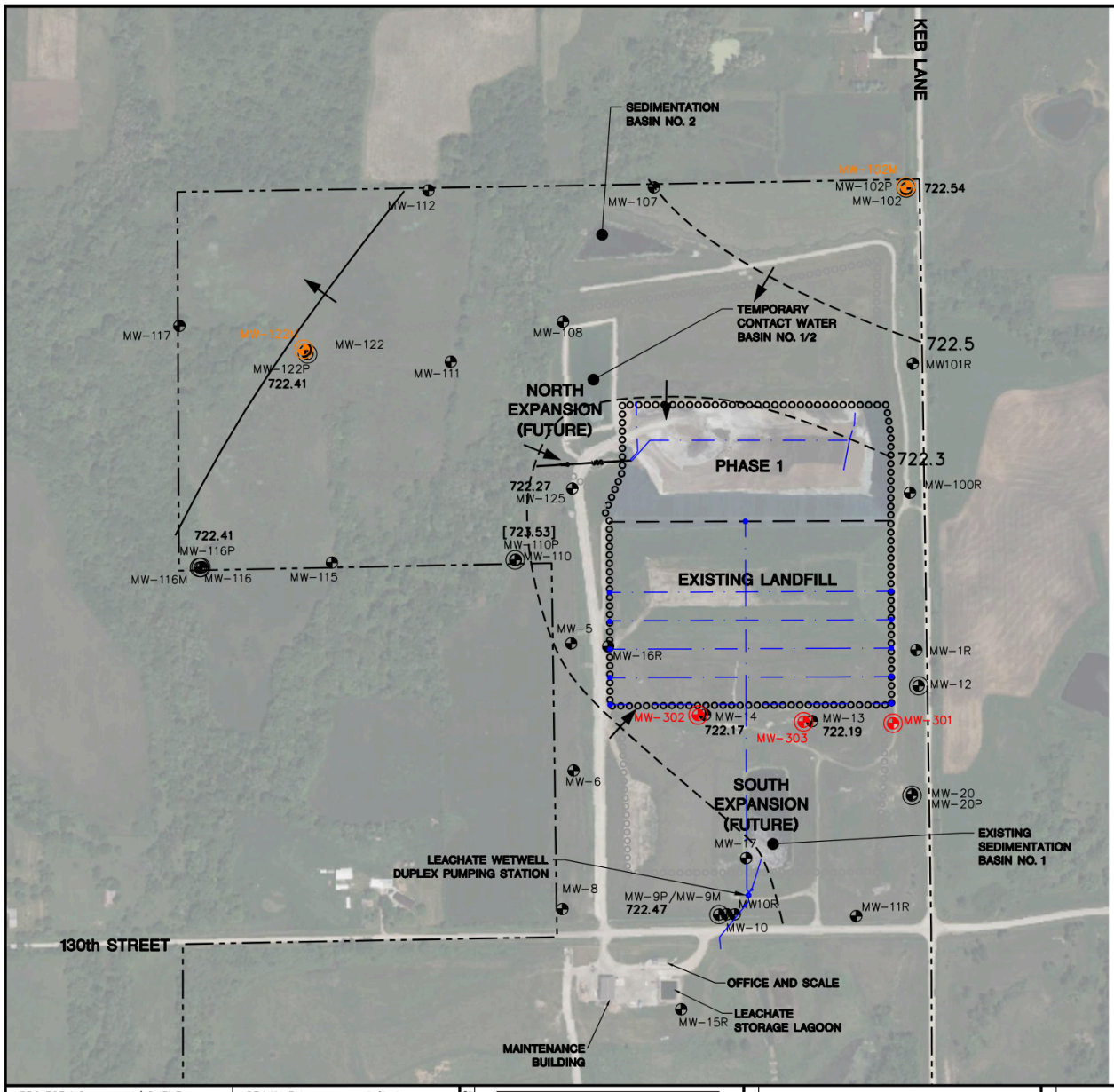

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DRAWN:	04/23/2025	CHECKED BY:	NLB 10/28/2025						
REVISED:	11/11/2025	APPROVED BY:	TK 11/20/2025						

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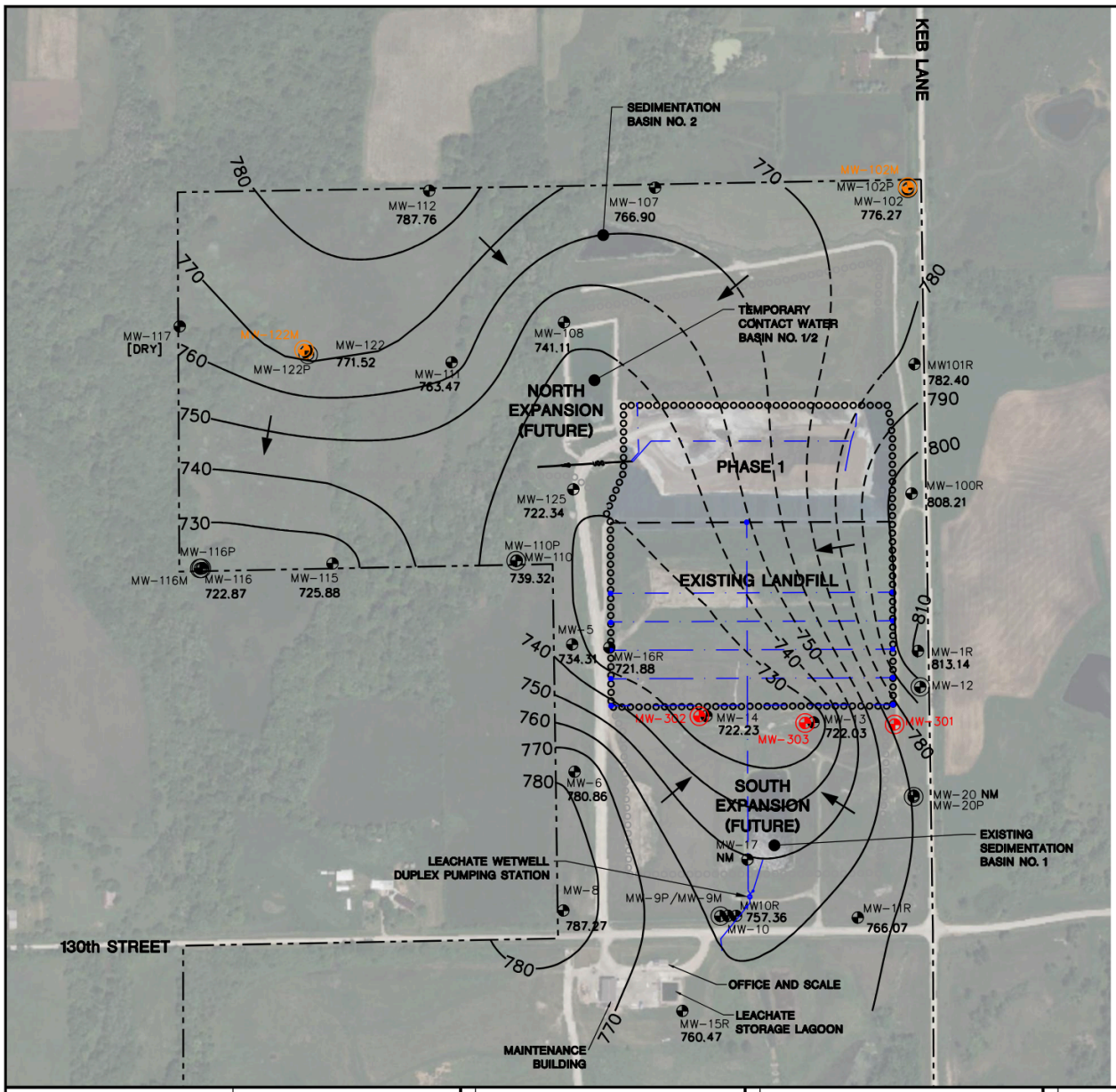

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PROJECT NO.	25225073.00	DRAWN BY:	RVG
DRAWN:	08/13/2025	CHECKED BY:	NLB 10/28/2025
REVISED:	10/28/2025	APPROVED BY:	TK 11/20/2025

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT CO.
15300 130th STREET
OTTUMWA, IA 52501

SITE: OTTUMWA MIDLAND LANDFILL
OTTUMWA, IOWA

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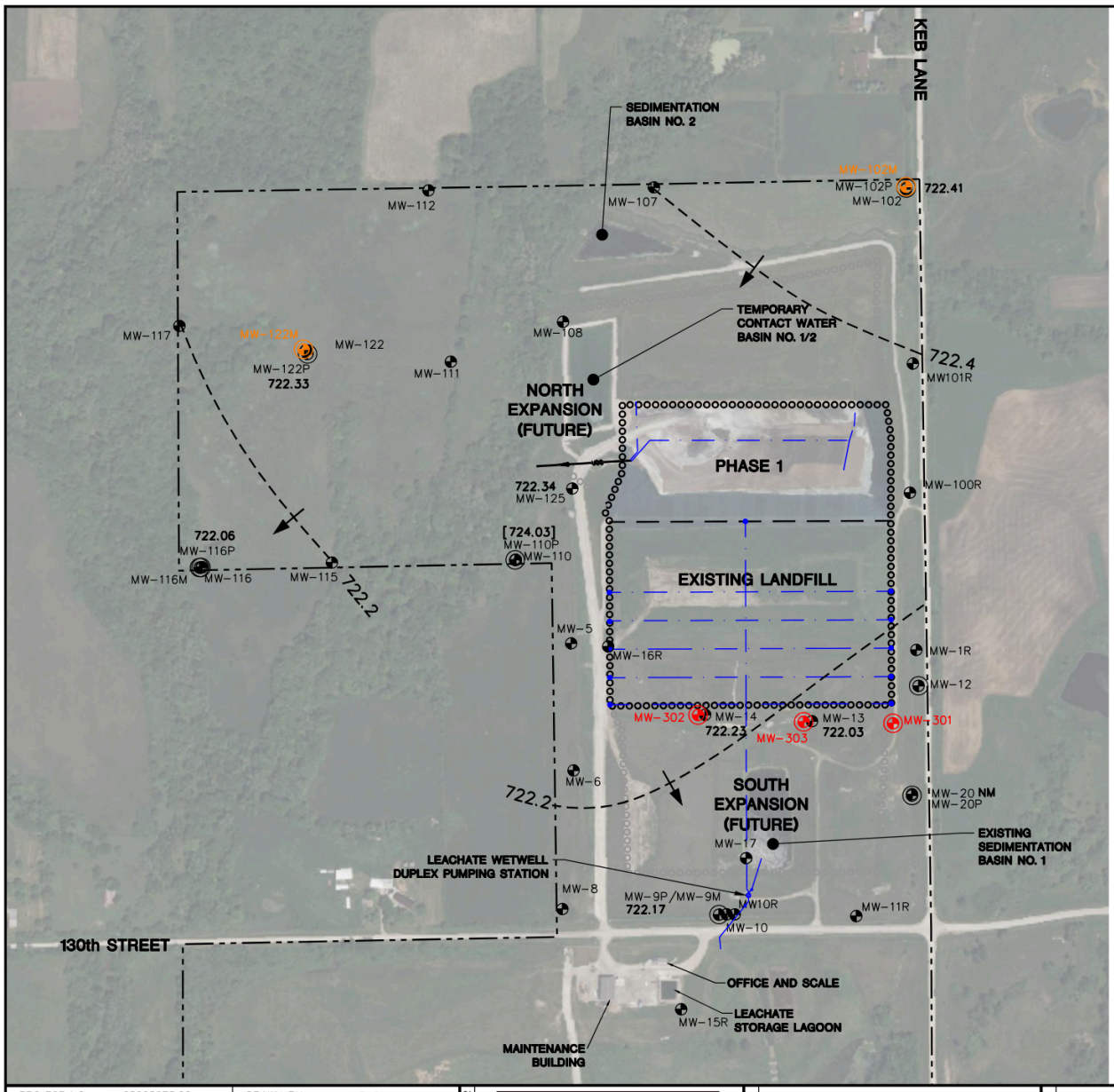

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NOTES:

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2. PROPE SURVE ASSOC DECEM
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PROJECT NO.	25225073.00	DRAWN BY:	RVG	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501	SITE	OTTUMWA MIDLAND LANDFILL OTTUMWA, IOWA
DRAWN:	08/13/2025	CHECKED BY:	NLB 10/28/2025						
REVISED:	11/11/2025	APPROVED BY:	TK 11/20/2025						

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Appendix A

Groundwater Sampling Field Sheets

SCS ENGINEERS Environmental Consultants & Contractors

Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-125	**Date**	4/8/25
Sampling Personnel	Michael Morgan		
Total Well Depth	78.17	**pH/temp/cond/DO/ORP meter model & unit ID #**	PRO DSS 23A705537
Depth to Water	Pre 63.13 & post pump 63.98	**Date/time pH Calibration Last Checked:**	4/8/25 12:55
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	Bladder Pump / Peristaltic Pump / Other:	**Pumping Rate:**	200 ml/min
Water Color/Odor	Grey Brown / Ocean	**Pump Start/Stop Time**	13:49 / 15:54
Temperature:	8°C	**Wind Direction:**	N E (S) W
Precip:	None Light Heavy	**Sky:**	Cloudy Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
14:03	63.24	17.3	6.94	7.04	1290	216.6	112.32	cloudy light brown
14:08	63.33	13.6	6.87	3.91	1888	304.3	336.74	
14:13	63.33	13.3	6.87	2.25	1911	345.9	412.27	cloudy brown
14:18	63.36	13.3	6.86	2.03	1917	370.2	386.47	Grey brown
14:23	63.36	13.4	6.85	1.90	1912	385.0	377.80	
14:28	63.36	13.4	6.84	1.76	1931	395.5	356.52	
14:33	63.34	13.3	6.83	1.68	1942	402.6	279.87	
14:38	63.34	13.1	6.82	1.65	1949	407.6	354.85	
14:43	63.35	13.1	6.80	1.61	1984	411.2	280.34	
14:48	63.33	13.0	6.76	1.49	2123	407.6	240.47	
14:53	63.34	13.0	6.73	1.37	2258	355.1	185.54	
14:58	63.33	13.0	6.71	1.35	2410	264.7	133.84	

Sample Bottles Collected:

Sample Date /Time:

Additional Notes: Top of pump = ~67 ft Pump installed
water color mostly grey brown with range of turbidity
water color grey tint by sample time

*: Volume in a 2-inch well = 617 ml/ft

S:\1_Scientist Log Forms\LOG FORMS\Groundwater Sampling Log_v3.docx

Environmental Consultants
and Contractors

2830 Dairy Drive
Madison, WI 53718-6751

608 224-2830
FAX 608 224-2839
www.scsengineers.com

SCS ENGINEERS

Groundwater Sampling Log

Project No. 25225073.00 **Site** GML
Well No. MW-125 cont... **Date** 4/8/25
Well Depth **Sampling Device**
Water Level **Other Info.**
Purge Volume **Pumping Rate**
Sampling Personnel Michael Morgan
Color/Odor

Time	Water Level	Temp.	pH	DO (mg/L)	Conductivity (µs/cm)	ORP	Turbidity	Notes
Stability Requirements:		+/- 3%	+/- 0.1 unit	±/- 10%	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
15:03	63.32	12.8	6.69	1.20	2540	179.0	99.88	
15:08	63.31	12.8	6.68	1.16	2633	124.0	78.45	
15:13	63.32	12.9	6.67	1.15	2696	102.3	72.95	
15:18	63.31	12.9	6.67	1.19	2749	94.6	53.66	
15:23	63.34	12.9	6.66	1.25	2791	92.8	49.34	
15:28	63.31	12.9	6.65	1.11	2830	93.5	50.14	
15:33	63.30	12.9	6.65	1.21	2854	95.7	40.86	
15:38	63.30	13.0	6.65	1.22	2880	99.2	42.11	
15:43	63.31	12.9	6.64	1.21	2893	102.8	40.58	SAMPLE

Type of Samples Collected:

Additional Notes:

Information: 2 in = 617 ml/ft, 4 in = 2,470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi r^3$

SCS ENGINEERS Environmental Consultants & Contractors

Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-1R	**Date**	8-6-25
Sampling Personnel	Garrett Horan		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	23A105517 Pro DSS
Depth to Water	10.17	**Date/time pH Calibration Last Checked:**	8-6-25 6:30a
Well Volume*		**Turbidity meter model & unit ID #**	

Sampling Device: Bladder Pump (circled) Peristaltic Pump Other: **Pumping Rate:** 100 ml/min

Water Color/Odor Clear / None **Pump Start/Stop Time** 7:54 /

Temperature: 22°C **Wind Direction:** N (E) S W **Precip:** None (circled) Light Heavy **Sky:** Cloudy (circled) Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
7:55	10.21	13.9	6.61	2.84	778	276.7	15.18	
8:00	10.42	13.5	6.76	1.01	790	273.0	4.39	
8:05	10.71	13.8	6.81	0.90	787	271.2	3.81	
8:10	11.10	14.5	6.88	2.07	789	267.1	5.78	
8:15	11.09	18.0	6.92	2.06	785	263.5	5.27	
8:20	11.10	18.6	6.93	2.08	790	263.5	5.35	
8:25	11.10	18.8	6.93	2.07	792	263.3	5.18	

Sample Bottles Collected:

Sample Date /Time: 8-6-25 9:31

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-12	**Date**	8/5/25
Sampling Personnel	Michael Morgan		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	PRO DSS 23A205517
Depth to Water	100.36	**Date/time pH Calibration Last Checked:**	8/5/25 7:00
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	**Pumping Rate:**	< 50 ml/min
Water Color/Odor	/	**Pump Start/Stop Time**	14:28 / 16:10
Temperature:	27°C **Wind Direction:** N E S W	**Precip:** (None) Light Heavy	**Sky:** Cloudy Sunny (Partly)

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
14:42	100.61	33.8	7.25	6.82	1129	118.3	5.68	
14:47	100.41	33.5	7.20	7.13	2398	173.5	5.36	
14:52	100.42	33.6	7.21	7.09	2423	188.5	5.39	
14:57	100.48	33.2	7.22	7.10	2429	194.8	5.41	
15:02	100.46	32.5	7.23	7.64	2434	188.0	5.73	SAMPLE

Sample Bottles Collected:

Sample Date /Time: Filled 250 ml metals bottle & ~100 ml of 1L bottle.

Additional Notes: Top of pump ~ 119.80 ft
Initially tried Cleanerator/compressor but couldn't draw water after 30 min
transferred over to bladder pump controller & managed to very low flow
< 50 ml/min

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-12	**Date**	8/6/25
Sampling Personnel	Michael Morgan		PRO DSS 23A105517
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	[redacted]
Depth to Water	100.31	**Date/time pH Calibration Last Checked:**	8/6/25 7:10
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	**Pumping Rate:**	100 ml/min
Water Color/Odor	clear / none	**Pump Start/Stop Time**	10:23 / 11:42
Temperature:	24°C **Wind Direction:** N E (S) W	**Precip:** (None) (Light) Heavy	**Sky:** (Cloudy) Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
10:46	101.04	24.6	7.16	6.80	2757	18.0	8.13	
10:51	102.08	16.0	7.79	5.76	2560	61.4	10.02	
10:56	103.22	16.1	7.77	2.84	2557	89.7	13.82	
11:01	103.96	15.2	7.79	3.18	2547	97.5	8.21	
11:06	104.78	15.1	7.80	3.57	2540	105.9	9.78	
11:11	105.67	15.3	7.80	3.87	2541	112.0	11.02	
11:16	106.64	15.5	7.80	4.05	2542	116.2	14.48	
11:21	107.13	15.8	7.80	3.99	2548	114.1	13.66	
11:26	107.84	16.0	7.80	3.84	2551	111.9	13.61	SAMPLE

Sample Bottles Collected:

Sample Date /Time: Top of Pump = 119.80 ft

Additional Notes: Used Generator / compressor

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-13	**Date**	8-5-25
Sampling Personnel	Garrett Horvis		
Total Well Depth		**pH/temp/cond/DO/ORP meter model & unit ID #**	23A105517 Pro-Dss
Depth to Water	40.45	**Date/time pH Calibration Last Checked:**	8-5-25
Well Volume*		**Turbidity meter model & unit ID #**	6:30a
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	**Pumping Rate:**	100 ml/min
Water Color/Odor	Clear / None	**Pump Start/Stop Time**	11:43 / 1:30
Temperature:	22°C **Wind Direction:** N E S W	**Precip:** (None) Light Heavy	**Sky:** Cloudy (Sunny) Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
11:46	40.55	21.4	7.82	7.49	3220	119.6	-0.46	
11:51	40.55	17.3	7.13	1.60	3293	137	-0.09	
11:56	40.55	17.5	7.07	0.88	3299	140.6	-0.23	
12:01 ~~11:~~	40.55	17.3	7.05	0.61	3298	139.5	-0.49	
12:06	40.60	18.0	7.03	0.50	3292	128.7	-0.44	
12:11	40.60	17.9	7.02	0.44	3290	111.3	-0.36	
12:16	40.60	17.9	7.02	0.44	3291	81.7	-0.28	
12:21	40.60	17.9	7.01	0.36	3287	52.0	0.15	
12:27	40.60	17.8	7.01	0.36	3290	48.9	0.26	
12:33	40.60	17.6	7.01	0.35	3280	37.2	0.56	
12:38	40.60	18.1	7.01	0.34	3292	27.0	0.95	
12:43	40.60	18.2	7.00	0.32	3295	18.3	1.47	

Sample Bottles Collected:

Sample Date /Time: 8-5-25 1:30pm

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	**Site**
Well No. MW-13 Cont.	**Date**
Sampling Personnel	
Total Well Depth	**pH/temp/cond/DO/ORP meter model & unit ID #**
Depth to Water	**Date/time pH Calibration Last Checked:**
Well Volume*	**Turbidity meter model & unit ID #**
Sampling Device: Bladder Pump / Peristaltic Pump / Other:	**Pumping Rate:**
Water Color/Odor /	**Pump Start/Stop Time** /
Temperature:	**Wind Direction:** N E S W **Precip:** None Light Heavy **Sky:** Cloudy Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
12:47	40.60	18.2	7.01	0.31	3289	15.5	1.67	
12:52	40.60	17.7	7.00	0.29	3284	12	0.86	
12:57	40.60	17.8	7.00	0.28	3288	-1.5	1.13	
13:02	40.60	17.6	7.00	0.28	3285	-2.7	1.17	

Sample Bottles Collected:

Sample Date /Time:

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-14	**Date**	8/5/25
Sampling Personnel	Michael Morgan & Garrett Hunt		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	23A105517 Pro DSS
Depth to Water	38.79	**Date/time pH Calibration Last Checked:**	8/5/25 7:00
Well Volume*		**Turbidity meter model & unit ID #**	

Sampling Device: Bladder Pump (circled) Peristaltic Pump Other: **Pumping Rate:** 100 ml/min

Water Color/Odor Clear / none **Pump Start/Stop Time** 7:26 / 9:30

Temperature: 17°C **Wind Direction:** N (E) S W **Precip:** None (circled) Light Heavy **Sky:** Cloudy Sunny (circled) Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
7:28	39.75	15.5	7.63	7.46	2943	271.5		
7:33	39.89	14.2	7.07	1.31	3009	280.3		
7:38	40.02	15.3	7.07	1.09	2990	279.1		
7:43	40.35	16.6	7.03	5.42	2648	175.5	10.44	Changed YSI
7:48	40.54	15.0	7.04	1.40	2913	174.5	5.70	
7:53	40.83	15.3	7.04	0.95	2919	174.9	5.90	
7:58	41.05	15.6	7.03	0.94	2920	175.9	6.13	
8:03	41.05	16.5	7.03	0.97	2917	177.2	6.20	Sample

Sample Bottles Collected:

Sample Date /Time: 8-5-25 8:07

Additional Notes: Color: Clear Odor: none

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-15R	**Date**	8/5/25
Sampling Personnel	Michael Morgan		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	PRO DSS 23A105517
Depth to Water	48.02	**Date/time pH Calibration Last Checked:**	8/5/25 7:00
Well Volume*		**Turbidity meter model & unit ID #**	

Sampling Device: Bladder Pump (circled) Peristaltic Pump Other: **Pumping Rate:** 150 ml/min

Water Color/Odor clear / none **Pump Start/Stop Time** 11:39 / 13:13

Temperature: 24°C **Wind Direction:** N (E) (S) W **Precip:** None (circled) Light Heavy **Sky:** Cloudy Sunny Partly (circled)

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
11:44	48.12	26.5	6.89	7.46	2144	166.8	8.17	
11:49	48.27	17.9	6.27	3.66	2271	7.4	5.92	
11:54	48.31	18.5	6.24	1.84	2298	21.6	8.74	
11:59	48.48	18.7	6.21	1.10	2284	38.7	9.55	
12:04	48.49	19.1	6.20	0.88	2270	50.4	10.38	
12:09	48.55	20.1	6.20	0.81	2264	56.5	14.64	
12:14	48.68	20.4	6.19	0.78	2251	63.3	9.52	
12:19	48.73	21.4	6.19	0.68	2235	66.9	8.71	
12:24	48.76	22.1	6.18	0.68	2225	69.1	8.78	
12:29	48.88	22.2	6.18	0.67	2221	70.5	8.94	SAMPLE

Sample Bottles Collected:

Sample Date /Time:

Additional Notes: Top of pump ~ 53.50 ft

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-16R	**Date**	8/6/25
Sampling Personnel	Michael Morgan		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	PRO DSS 23A105517
Depth to Water	92.25	**Date/time pH Calibration Last Checked:**	8/6/25 7:10
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	**Pumping Rate:**	250 ml/min
Water Color/Odor	clear /	**Pump Start/Stop Time**	12:05 / 12:48
Temperature:	27°C **Wind Direction:** N E (S) W	**Precip:** (None) Light Heavy	**Sky:** (Cloudy) Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
12:08	92.44	19.3	8.12	7.66	3017	111.4	4.95	
12:13	92.42	15.4	6.92	4.16	3058	153.7	5.03	
12:18	92.49	15.1	6.86	0.91	3003	61.6	6.59	
12:23	92.45	15.1	6.85	0.56	3046	25.5	3.66	
12:28	92.54	14.9	6.84	0.43	3076	15.3	4.63	
12:33	92.48	14.9	6.84	0.34	3092	13.7	4.35	
12:38	92.51	15.0	6.83	0.29	3093	7.2	4.39	SAMPE

Sample Bottles Collected:

Temp = 25.3°C, DO = 8.03 mg/L, conductivity = 644 µS/cm, pH = 7.59

Sample Date /Time: ORP = 124.7 mV, Turbidity = 2.81 NTU.

Additional Notes: Top of pump → 101.50

Generator & compressor used.

Field blank collected at 12:55

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	**Site**	OMC
Well No.	MW-1001R	**Date**	8-5-25
Sampling Personnel	Garrett Horak		
Total Well Depth	—	**pH/temp/cond/DO/ORP meter model & unit ID #**	Pro DSS 16G102142
Depth to Water	14.19	**Date/time pH Calibration Last Checked:**	8/5/25 8:15
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	**Pumping Rate:**	50ml/min
Water Color/Odor	Clear / None	**Pump Start/Stop Time**	9:43a / 11:16
Temperature:	22°C **Wind Direction:** N (E) S W	**Precip:** (None) Light Heavy	**Sky:** Cloudy (Sunny) Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
9:45	14.48	15.5	~~7.52~~ 7.77	6.52	1030	100.2	5.13	
9:50	14.60	16.9	7.29	4.52	932	139.6	1.00	
9:55	~~[illegible]~~	19.9	7.20	4.51	937	~~[illegible]~~ 94.3	0.56	
14.60 10:00	14.60	22.8	7.20	4.51	942	170.7	0.33	
10:05	14.60	22.3	7.18	4.38	953	180.4	0.22	
10:10	14.60	22.6	7.15	4.35	960	186.1	0.82	
10:15	14.60	22.5	7.14	4.31	963	191.7	2.35	

Sample Bottles Collected:

Sample Date /Time:

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	Site	OML
Well No.	MW-101R	Date	8-6-25
Sampling Personnel			
Total Well Depth		pH/temp/cond/DO/ORP meter model & unit ID #	23A105517 PRO-DSS
Depth to Water	16.95	Date/time pH Calibration Last Checked:	8-6-25 6:30a
Well Volume*		Turbidity meter model & unit ID #	
Sampling Device:	Bladder Pump / Peristaltic Pump / Other:	Pumping Rate:	150 ml/min
Water Color/Odor	Gray / None	Pump Start/Stop Time	9:58 / 11:11
Temperature:	20°C	Wind Direction: N E S W	Precip: None Light Heavy Sky: Cloudy Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
9:58	17.24	16.4	7.12	5.59	1415	229.7	51.81	
10:03	17.71	14.8	6.82	0.71	1433	196.3	42.23	
10:08	17.71	16.6	6.82	0.55	1445	196.7	26.64	
10:13	17.71	17.7	6.82	0.55	1449	196.7	24.51	
10:18	17.71	19.7	6.81	0.60	1457	196.3	23.60	
10:23	17.71	21.1	6.81	0.68	1463	195.9	23.08	
10:28	17.71	15.0	6.83	0.59	1444	190.6	21.01	
10:33	17.71	14.4	6.81	0.29	1431	187.8	14.99	
10:38	17.71	14.2	6.81	0.36	1421	182.4	11.87	
10:43	17.71	14.4	6.82	0.38	1432	179.0	11.42	

Sample Bottles Collected: 1100a 8-6-25

Sample Date /Time:

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	Site	OML
Well No.	MW-102P	Date	8/6/25
Sampling Personnel	Michael Morgan		
Total Well Depth	—	pH/temp/cond/DO/ORP meter model & unit ID #	PRO DSS 23A105577
Depth to Water	75.23	Date/time pH Calibration Last Checked:	8/6/25 ~~[illegible]~~ 7:10
Well Volume*		Turbidity meter model & unit ID #	
Sampling Device:	(Bladder Pump) Peristaltic Pump Other:	Pumping Rate:	50 ml/min
Water Color/Odor	clear / none	Pump Start/Stop Time	7:54 / 10:03
Temperature:	19°C	Wind Direction:	N (E)(S) W
Precip:	(None) Light Heavy	Sky:	Cloudy (Sunny) Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
7:58	75.26	21.1	7.72	8.74	2394	136.3	7.77	
8:03	75.26	17.3	6.78	8.89	2727	171.7	5.53	
8:08	75.25	17.1	6.64	5.01	2828	57.1	6.14	
8:13	75.25	17.5	6.42	3.97	2833	37.2	4.99	
8:18	75.26	17.6	6.41	3.55	2839	33.8	4.54	
8:23	75.26	17.9	6.40	2.64	2847	31.7	4.07	
8:28	75.26	18.3	6.39	2.29	2851	29.7	3.94	
8:33	75.27	18.5	6.38	2.07	2863	30.4	4.76	
8:38	75.27	18.8	6.38	1.97	2859	29.9	4.61	
8:43	75.27	18.9	6.38	1.90	2857	30.8	4.29	SAMPLE
~~8:48~~								

Sample Bottles Collected:

Sample Date /Time:

Additional Notes: Top of pump = ~97.5 ft

*: Volume in a 2-inch well = 617 ml/ft

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Groundwater Sampling Log

Project No.	25225073.00	Site	OML
Well No.	MW-108	Date	8-5-25
Sampling Personnel	Garrett Horak		
Total Well Depth	—	pH/temp/cond/DO/ORP meter model & unit ID #	23A105517 A0-03
Depth to Water	24.46	Date/time pH Calibration Last Checked:	8-5-25 6:30a
Well Volume*		Turbidity meter model & unit ID #	
Sampling Device:	Bladder Pump / Peristaltic Pump / Other:	Pumping Rate:	110 ml/min
Water Color/Odor	Brown / None	Pump Start/Stop Time	14:20 / 15:47
Temperature:	22°C	Wind Direction:	N E S W
Precip:	None Light Heavy	Sky:	Cloudy Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
14:24	24.70	18.7	6.96	4.06	761	135.4	85.11	
14:29	[illegible]	15.10	6.75	0.246	704	124.1	30.73	
14:34	25.10	17.0	6.64	0.37	674	112.0	6.88	
14:39	25.10	16.4	6.59	0.33	633	100.2	4.34	
14:42	25.10	17.2	6.50	0.47	574	60.2	2.28	
14:52	25.10	16.3	6.47	0.58	561	27.6	0.97	
14:57	25.10	16.4	6.43	0.77	557	22.4	0.99	
15:02	25.10	16.2	6.43	0.71	565	8.1	0.57	
15:07	25.10	16.6	6.44	0.56	576	-3.0	0.20	
15:12	25.10	17.0	6.46	0.44	590	[illegible]	0.07	ORP: -13.9
15:17	25.10	17.0	6.47	0.38	599	-19.7	0.27	
15:23	25.10	16.8	6.48	0.37	599	-20.6		

Sample Bottles Collected: 8-5-25 15:23

Sample Date /Time:

Additional Notes: Water became more clear as stabilization was on.

*: Volume in a 2-inch well = 617 ml/ft

S:\1_Scientist Log Forms\LOG FORMS\Groundwater Sampling Log_v3.docx

SCS ENGINEERS Environmental Consultants & Contractors

Groundwater Sampling Log

Project No.	25225073.00	**Site**	OML
Well No.	MW-125	**Date**	8-6-25
Sampling Personnel			
Total Well Depth		**pH/temp/cond/DO/ORP meter model & unit ID #**	23A105517. Pro-155
Depth to Water	63.06	**Date/time pH Calibration Last Checked:**	8-6-25 6:30a
Well Volume*		**Turbidity meter model & unit ID #**	
Sampling Device:	Bladder Pump / Peristaltic Pump / Other:	**Pumping Rate:**	
Water Color/Odor	/	**Pump Start/Stop Time**	1:20 /
Temperature: 20°C	**Wind Direction:** N (E) S W	**Precip:** (None) Light Heavy	**Sky:** Cloudy (Sunny) Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:		+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU	
13:23	63.21	20.1	7.89	7.30	2889	173.5	23.46	
13:28	63.37	16.0	7.04	1.26	1985	196.6	20.88	
13:33	63.44	15.9	6.92	0.57	1881	200.7	14.92	
13:38	63.44	16.7	6.88	0.46	1879	202.3	9.07	
13:43	63.44	16.6	6.83	0.39	1978	203.3	6.34	
13:48	63.44	16.3	6.77	0.36	2406	151.0	12.94	
13:53	63.44	16.4	6.73	0.33	2635	10.1	28.03	
13:58	63.44	16.3	6.71	0.31	2697	-14.8	40.20	
14:03	63.44	16.2	6.70	0.31	2750	-23.5	57.85	
14:08	63.44	16.3	6.69	0.30	2801	-25.7	79.55	
14:13	63.44	16.1	6.67	0.29	2838	-26.6	25.13	
14:18	63.44	16.2	6.67	0.28	2857	-27.1	7.99	

Sample Bottles Collected:

Sample Date /Time:

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

S:\1_Scientist Log Forms\LOG FORMS\Groundwater Sampling Log_v3.docx

SCS ENGINEERS Environmental Consultants & Contractors

Groundwater Sampling Log

Project No.	**Site**
Well No. M125 Cont.	**Date**
Sampling Personnel	
Total Well Depth	**pH/temp/cond/DO/ORP meter model & unit ID #**
Depth to Water	**Date/time pH Calibration Last Checked:**
Well Volume*	**Turbidity meter model & unit ID #**
Sampling Device: Bladder Pump / Peristaltic Pump / Other:	**Pumping Rate:** 115 ml/min
Water Color/Odor /	**Pump Start/Stop Time** /
Temperature:	**Wind Direction:** N E S W **Precip:** None Light Heavy **Sky:** Cloudy Sunny Partly

Time	Depth to Water (ft)	Temp. (deg. C)	pH (standard units)	DO (mg/L)	Cond. (µs/cm)	ORP (mV)	Turbidity (NTU)	Notes
Stability Requirements – last 3 consecutive readings must be within:	+/- 3%	+/- 0.1 unit	+/- 10% or 3 readings <0.5 mg/L	+/- 3%	+/- 10mV	+/- 10% or 3 readings <5 NTU		
14:23	63.44	16.4	6.67	0.27	2890	-27.4	12.98	
14:28	63.44	16.0	6.67	0.26	29.25	-27.4	35.68	
14:33	63.44	16.4	6.65	0.26	2930	-28.0	34.45	
14:38	63.44	16.4	6.65	0.25	2929	-28.1	41.09	SAMPLE

Sample Bottles Collected:

Sample Date /Time:

Additional Notes:

*: Volume in a 2-inch well = 617 ml/ft

S:\1_Scientist Log Forms\LOG FORMS\Groundwater Sampling Log_v3.docx

SURFACE WATER SAMPLING FORM

Site Name: OML
Permit No.:
Surface Monitoring Point No.: GU-1
Date/Time: 8/6/25 14:15
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Underdrain

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Underdrain pipe flowing into access manhole with pump system

Was monitoring point dry? No
Too little water to sample? No
Was water flowing? [x] Yes [ ] No
If yes, estimate quantity 450 ml / min
If yes, estimate depth NA
Was water discolored? [ ] Yes [x] No
If yes, describe
Does water have odor? [ ] Yes [x] No
If yes, describe
Was ground discolored? [ ] Yes [x] No
If yes, describe
Litter present? [ ] Yes [x] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 78°F, cloudy, wind S 15 mph

Field Measurements (after stabilization):

Temperature 21.5 Units °C
Equipment Used
pH 6.76 Equipment Used
Specific Conditions 1422 Units uS/cm
Equipment Used

DO = 8.86 mg/L ORP = 172.0 mV Turbidity = 2.68 NTU

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill Permit No.: _____
Surface Monitoring Point No.: au-2 Date/Time: 8/6/25 14:00
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Underdrain

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Underdrain

Was monitoring point dry? Yes Too little water to sample? _____
Was water flowing? [ ] Yes [x] No
If yes, estimate quantity _____ If yes, estimate depth _____
Was water discolored? [ ] Yes [ ] No
If yes, describe _____
Does water have odor? [ ] Yes [ ] No
If yes, describe _____
Was ground discolored? [ ] Yes [ ] No
If yes, describe _____
Litter present? [ ] Yes [ ] No
If yes, describe _____

D. FIELD MEASUREMENT

Weather Conditions 78°F, Cloudy, wind S 15 mph

Field Measurements (after stabilization):

Temperature _____ Units _____
Equipment Used _____
pH _____ Equipment Used _____
Specific Conditions _____ Units _____
Equipment Used _____

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill
Permit No.:
Surface Monitoring Point No.: GW-EX
Date/Time: 8/6/25 7:30
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Underdrain outlet

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Pump system installed to obtain sample. Pump turned on/off by landfill staff

Was monitoring point dry? No
Too little water to sample? No
Was water flowing? [x] Yes [ ] No
If yes, estimate quantity N/A
If yes, estimate depth N/A
Was water discolored? [ ] Yes [x] No
If yes, describe
Does water have odor? [ ] Yes [x] No
If yes, describe
Was ground discolored? [ ] Yes [x] No
If yes, describe
Litter present? [ ] Yes [x] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 18°C, Sunny

Field Measurements (after stabilization):

Temperature 23.1 Units °C
Equipment Used
pH 7.34 Equipment Used
Specific Conditions 1238 Units 25°C $\frac{uS}{cm}$
Equipment Used

DO = 7.00 $\frac{mg}{L}$ ORP = 188.5 mV Turbidity = 10.28 NTU

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill Permit No.:
Surface Monitoring Point No.: TCB - 1/2 Date/Time: 8/6/25 13:45
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Water Basin /pond

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Noteable Algae present and frogs / invertebrates

Was monitoring point dry? No Too little water to sample? No
Was water flowing? [ ] Yes [x] No
If yes, estimate quantity If yes, estimate depth 7.30 ft
Was water discolored? [ ] Yes [x] No
If yes, describe
Does water have odor? [x] Yes [ ] No
If yes, describe Green vegetation
Was ground discolored? [ ] Yes [x] No
If yes, describe
Litter present? [ ] Yes [x] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 78°F, cloudy, wind S 16 mph

Field Measurements (after stabilization):

Temperature 27.8 Units °C
Equipment Used Pro DSS YSI
pH 8.70 Equipment Used Pro DSS YSI
Specific Conditions Conductivity = 809 Units SPC µS/cm
Equipment Used Pro DSS YSI

DO → 9.26 mg/L ORP → 118.4 mV Turbidity → 5.81 NTU

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill Permit No.:
Surface Monitoring Point No.: SW - 1R Date/Time: 8/5/25 10:30
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [x] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [ ] Other (describe)

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Thick vegetation, muddy under foot

Was monitoring point dry? Yes Too little water to sample?
Was water flowing? [ ] Yes [ ] No
If yes, estimate quantity If yes, estimate depth
Was water discolored? [ ] Yes [ ] No
If yes, describe
Does water have odor? [ ] Yes [ ] No
If yes, describe
Was ground discolored? [ ] Yes [ ] No
If yes, describe
Litter present? [ ] Yes [ ] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 69°F, Sunny, Wind 6mph SE

Field Measurements (after stabilization):

Temperature Units
Equipment Used
pH Equipment Used
Specific Conditions Units
Equipment Used

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill Permit No.: _____

Surface Monitoring Point No.: SW - 2R Date/Time: 8/6/25 14:30

Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [x] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [ ] Other (describe) _____

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Muddy stream bed

Was monitoring point dry? Yes Too little water to sample? _____

Was water flowing? [ ] Yes [ ] No

If yes, estimate quantity _____ If yes, estimate depth _____

Was water discolored? [ ] Yes [ ] No

If yes, describe _____

Does water have odor? [ ] Yes [ ] No

If yes, describe _____

Was ground discolored? [ ] Yes [ ] No

If yes, describe _____

Litter present? [ ] Yes [ ] No

If yes, describe _____

D. FIELD MEASUREMENT

Weather Conditions 80°F, cloudy, wind 13 mph SSE

Field Measurements (after stabilization):

Temperature _____ Units _____

Equipment Used _____

pH _____ Equipment Used _____

Specific Conditions _____ Units _____

Equipment Used _____

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill
Permit No.:
Surface Monitoring Point No.: SW-3
Date/Time: 8-6-25 12:04
Sampler Name: Garrett Horaks

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Pond

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Stagnant Pond, algae growth, shallow

Was monitoring point dry? NO
Too little water to sample? NO
Was water flowing? [ ] Yes [x] No
If yes, estimate quantity
If yes, estimate depth
Was water discolored? [ ] Yes [x] No
If yes, describe
Does water have odor? [ ] Yes [x] No
If yes, describe
Was ground discolored? [ ] Yes [x] No
If yes, describe
Litter present? [ ] Yes [x] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 75°F Overcast

Field Measurements (after stabilization):

Temperature 27.4°C Units
Equipment Used Pro-DSS YSI
pH 7.80 Equipment Used
Specific Conditions Units
Equipment Used

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill Permit No.:
Surface Monitoring Point No.: SW-4 Date/Time: 8/6/25 14:45
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [x] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [ ] Other (describe)

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Thick vegetation around monitoring point culvert & stream were both dry with no standing/stagnant water

Was monitoring point dry? Yes Too little water to sample?
Was water flowing? [ ] Yes [ ] No
If yes, estimate quantity If yes, estimate depth
Was water discolored? [ ] Yes [ ] No
If yes, describe
Does water have odor? [ ] Yes [ ] No
If yes, describe
Was ground discolored? [ ] Yes [ ] No
If yes, describe
Litter present? [ ] Yes [ ] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 80°F, cloudy, wind 13 mph SSE

Field Measurements (after stabilization):

Temperature Units
Equipment Used
pH Equipment Used
Specific Conditions Units
Equipment Used

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill
Permit No.:
Surface Monitoring Point No.: SW-5
Date/Time: 8/6/25 14:50
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) wetland pond

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [ ] Within Landfill
- [x] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Monitoring Point dry at staff gauge. ~~Pond~~ Pooled water nearby.

Was monitoring point dry? Yes
Too little water to sample?
Was water flowing? [ ] Yes [ ] No
If yes, estimate quantity
If yes, estimate depth
Was water discolored? [ ] Yes [ ] No
If yes, describe
Does water have odor? [ ] Yes [ ] No
If yes, describe
Was ground discolored? [ ] Yes [ ] No
If yes, describe
Litter present? [ ] Yes [ ] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions 80°F, cloudy, Wind 13 mph SSE

Field Measurements (after stabilization):

Temperature Units
Equipment Used
pH Equipment Used
Specific Conditions Units
Equipment Used

SURFACE WATER SAMPLING FORM

Site Name: _____ Permit No.: _____

Surface Monitoring Point No.: LP-1 Date/Time: 8/6/25 15:30

Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- ☐ Stream
- ☐ Road Ditch
- ☐ Drainage Ditch
- ☐ Open Tile
- ☐ Tile with Riser
- ☒ Other (describe) Leachate well

B. PURPOSE OF MONITORING POINT

- ☐ Upstream
- ☒ Within Landfill
- ☐ Downstream
- ☐ Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Dry, Total Depth 11:35 ft

Was monitoring point dry? Yes Too little water to sample? _____

Was water flowing? ☐ Yes ☐ No

If yes, estimate quantity _____ If yes, estimate depth _____

Was water discolored? ☐ Yes ☐ No

If yes, describe _____

Does water have odor? ☐ Yes ☐ No

If yes, describe _____

Was ground discolored? ☐ Yes ☐ No

If yes, describe _____

Litter present? ☐ Yes ☐ No

If yes, describe _____

D. FIELD MEASUREMENT

Weather Conditions 83°F, Cloudy, Wind 5 mph SW

Field Measurements (after stabilization):

Temperature _____ Units _____

Equipment Used _____

pH _____ Equipment Used _____

Specific Conditions _____ Units _____

Equipment Used _____

SURFACE WATER SAMPLING FORM

Site Name: Ottumwa Midland Landfill
Permit No.:
Surface Monitoring Point No.: Leachate Pond
Date/Time: 8/6/25 15:50
Sampler Name: Michael Morgan

A. TYPE OF MONITORING POINT

- [ ] Stream
- [ ] Road Ditch
- [ ] Drainage Ditch
- [ ] Open Tile
- [ ] Tile with Riser
- [x] Other (describe) Leachate Pond

B. PURPOSE OF MONITORING POINT

- [ ] Upstream
- [x] Within Landfill
- [ ] Downstream
- [ ] Other (describe)

C. MONITORING POINT CONDITIONS

Condition commentary/field notes:
DO → 16.60 mg/L ORP → 110.9 mV Turbidity → 81.34 NTU

Was monitoring point dry? No
Too little water to sample? No
Was water flowing? [ ] Yes [x] No
If yes, estimate quantity
If yes, estimate depth
Was water discolored? [x] Yes [ ] No
If yes, describe Light brown
Does water have odor? [x] Yes [ ] No
If yes, describe Decomposing vegetation
Was ground discolored? [ ] Yes [x] No
If yes, describe
Litter present? [ ] Yes [x] No
If yes, describe

D. FIELD MEASUREMENT

Weather Conditions Cloudy, 83°F, wind SW 5mph

Field Measurements (after stabilization):

Temperature 29.9 Units °C
Equipment Used PRO DSS YSI
pH 8.23 Equipment Used PRO DSS YSI
Specific Conditions 4497 Units SPC (µS/cm)
Equipment Used PRO DSS YSI

Appendix B

Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 4/29/2025 11:20:32 AM

JOB DESCRIPTION

Ottumwa Midland Landfill 25225073

JOB NUMBER

310-304085-2

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job Narrative
310-304085-2

Receipt
The samples were received on 4/11/2025 4:30 PM. 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 was 1.8° C.

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

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

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

Sample Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-304085-7	MW-125	Water	04/08/25 15:43	04/11/25 16:30

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Client Sample ID: MW-125

Lab Sample ID: 310-304085-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.74	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	440		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.71	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	91		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	2100		100	82	ug/L	1		6020B	Total/NA
Calcium	88		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	1.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	1500		100	50	ug/L	1		6020B	Total/NA
Lithium	150		10	2.9	ug/L	1		6020B	Total/NA
Magnesium	45000		500	150	ug/L	1		6020B	Total/NA
Manganese	340		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	49		3.3	2.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	1900		50	36	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.27				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	102.8				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	1.21				mg/L	1		Field Sampling	Total/NA
Field pH	6.64				SU	1		Field Sampling	Total/NA
Field Conductivity	2893				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.9				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	40.58				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Client Sample ID: MW-125

Date Collected: 04/08/25 15:43
Date Received: 04/11/25 16:30

Lab Sample ID: 310-304085-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		5.0	2.3	mg/L			04/17/25 18:23	5
Fluoride	0.74	J	1.0	0.38	mg/L			04/17/25 18:23	5
Sulfate	440		5.0	2.1	mg/L			04/17/25 18:23	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.71	J	2.0	0.53	ug/L		04/17/25 09:00	04/21/25 16:54	1
Barium	91		2.0	0.66	ug/L		04/17/25 09:00	04/21/25 16:54	1
Beryllium	<0.33		1.0	0.33	ug/L		04/17/25 09:00	04/21/25 16:54	1
Boron	2100		100	82	ug/L		04/17/25 09:00	04/21/25 16:54	1
Calcium	88		0.50	0.19	mg/L		04/17/25 09:00	04/21/25 16:54	1
Cobalt	1.2		0.50	0.17	ug/L		04/17/25 09:00	04/21/25 16:54	1
Copper	<3.2		5.0	3.2	ug/L		04/17/25 09:00	04/21/25 16:54	1
Iron	1500		100	50	ug/L		04/17/25 09:00	04/21/25 16:54	1
Lead	<0.33		0.50	0.33	ug/L		04/17/25 09:00	04/21/25 16:54	1
Lithium	150		10	2.9	ug/L		04/17/25 09:00	04/21/25 16:54	1
Magnesium	45000		500	150	ug/L		04/17/25 09:00	04/21/25 16:54	1
Manganese	340		10	3.6	ug/L		04/17/25 09:00	04/21/25 16:54	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/17/25 09:00	04/21/25 16:54	1
Selenium	<1.4		5.0	1.4	ug/L		04/17/25 09:00	04/21/25 16:54	1
Zinc	<13		20	13	ug/L		04/17/25 09:00	04/21/25 16:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	49		3.3	2.3	mg/L			04/14/25 15:21	1
Total Dissolved Solids (SM 2540C)	1900		50	36	mg/L			04/12/25 16:17	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	722.27				ft			04/08/25 15:43	1
Oxidation Reduction Potential	102.8				mV			04/08/25 15:43	1
Oxygen, Dissolved	1.21				mg/L			04/08/25 15:43	1
Field pH	6.64				SU			04/08/25 15:43	1
Field Conductivity	2893				umhos/cm			04/08/25 15:43	1
Field Temperature	12.9				Degrees C			04/08/25 15:43	1
Field Turbidity	40.58				NTU			04/08/25 15:43	1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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 310-452106/3
Matrix: Water
Analysis Batch: 452106

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/17/25 13:27	1
Fluoride	<0.075		0.20	0.075	mg/L			04/17/25 13:27	1
Sulfate	<0.42		1.0	0.42	mg/L			04/17/25 13:27	1

Lab Sample ID: LCS 310-452106/4
Matrix: Water
Analysis Batch: 452106

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	10.2		mg/L		102	90 - 110
Fluoride	2.00	2.12		mg/L		106	90 - 110
Sulfate	10.0	10.0		mg/L		100	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-451804/1-A
Matrix: Water
Analysis Batch: 452267

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 451804

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		04/17/25 09:00	04/21/25 15:44	1
Barium	<0.66		2.0	0.66	ug/L		04/17/25 09:00	04/21/25 15:44	1
Beryllium	<0.33		1.0	0.33	ug/L		04/17/25 09:00	04/21/25 15:44	1
Boron	<82		100	82	ug/L		04/17/25 09:00	04/21/25 15:44	1
Calcium	<0.19		0.50	0.19	mg/L		04/17/25 09:00	04/21/25 15:44	1
Cobalt	<0.17		0.50	0.17	ug/L		04/17/25 09:00	04/21/25 15:44	1
Copper	<3.2		5.0	3.2	ug/L		04/17/25 09:00	04/21/25 15:44	1
Iron	<50		100	50	ug/L		04/17/25 09:00	04/21/25 15:44	1
Lead	<0.33		0.50	0.33	ug/L		04/17/25 09:00	04/21/25 15:44	1
Lithium	<2.9		10	2.9	ug/L		04/17/25 09:00	04/21/25 15:44	1
Magnesium	<150		500	150	ug/L		04/17/25 09:00	04/21/25 15:44	1
Manganese	<3.6		10	3.6	ug/L		04/17/25 09:00	04/21/25 15:44	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/17/25 09:00	04/21/25 15:44	1
Selenium	<1.4		5.0	1.4	ug/L		04/17/25 09:00	04/21/25 15:44	1
Zinc	<13		20	13	ug/L		04/17/25 09:00	04/21/25 15:44	1

Lab Sample ID: LCS 310-451804/2-A
Matrix: Water
Analysis Batch: 452267

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 451804

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	212		ug/L		106	80 - 120
Barium	100	103		ug/L		103	80 - 120
Beryllium	100	97.6		ug/L		98	80 - 120
Boron	200	197		ug/L		99	80 - 120
Calcium	2.00	1.87		mg/L		93	80 - 120
Cobalt	100	105		ug/L		105	80 - 120
Copper	200	207		ug/L		103	80 - 120
Iron	200	215		ug/L		108	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-451804/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452267 — **Prep Batch: 451804**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	200	221		ug/L		110	80 - 120
Lithium	200	204		ug/L		102	80 - 120
Magnesium	2000	2000		ug/L		100	80 - 120
Manganese	100	99.5		ug/L		100	80 - 120
Molybdenum	200	195		ug/L		97	80 - 120
Selenium	400	399		ug/L		100	80 - 120
Zinc	200	196		ug/L		98	80 - 120

Lab Sample ID: MB 310-452054/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452401 — **Prep Batch: 452054**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	<1.3		2.0	1.3	ug/L		04/21/25 09:00	04/22/25 13:02	1

Lab Sample ID: LCS 310-452054/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452401 — **Prep Batch: 452054**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Molybdenum	200	206		ug/L		103	80 - 120

Lab Sample ID: 310-304085-7 MS — **Client Sample ID: MW-125**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452401 — **Prep Batch: 452054**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Molybdenum	1.6	J	200	212		ug/L		105	75 - 125

Lab Sample ID: 310-304085-7 MSD — **Client Sample ID: MW-125**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452401 — **Prep Batch: 452054**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Molybdenum	1.6	J	200	221		ug/L		110	75 - 125	4	20

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-451561/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451561

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			04/14/25 15:21	1

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: LCS 310-451561/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451561

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	97.0		mg/L		97	81 - 116

Lab Sample ID: MB 310-451673/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451673

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			04/15/25 14:22	1

Lab Sample ID: LCS 310-451673/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451673

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	92.0		mg/L		92	81 - 116

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

Lab Sample ID: MB 310-451431/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451431

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<36		50	36	mg/L			04/12/25 16:17	1

Lab Sample ID: LCS 310-451431/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451431

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	980		mg/L		98	88 - 110

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

HPLC/IC

Analysis Batch: 452106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	9056A	
MB 310-452106/3	Method Blank	Total/NA	Water	9056A	
LCS 310-452106/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 451804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	3005A	
MB 310-451804/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-451804/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 452054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-452054/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-452054/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-304085-7 MS	MW-125	Total/NA	Water	3005A	
310-304085-7 MSD	MW-125	Total/NA	Water	3005A	

Analysis Batch: 452267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	6020B	451804
MB 310-451804/1-A	Method Blank	Total/NA	Water	6020B	451804
LCS 310-451804/2-A	Lab Control Sample	Total/NA	Water	6020B	451804

Analysis Batch: 452401

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-452054/1-A	Method Blank	Total/NA	Water	6020B	452054
LCS 310-452054/2-A	Lab Control Sample	Total/NA	Water	6020B	452054
310-304085-7 MS	MW-125	Total/NA	Water	6020B	452054
310-304085-7 MSD	MW-125	Total/NA	Water	6020B	452054

General Chemistry

Analysis Batch: 451431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	SM 2540C	
MB 310-451431/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-451431/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 451561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	I-3765-85	
MB 310-451561/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-451561/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 451673

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-451673/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-451673/2	Lab Control Sample	Total/NA	Water	I-3765-85	

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Field Service / Mobile Lab

Analysis Batch: 452990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-304085-7	MW-125	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Client Sample ID: MW-125

Date Collected: 04/08/25 15:43
Date Received: 04/11/25 16:30

Lab Sample ID: 310-304085-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	452106	WZC8	EET CF	04/17/25 18:23
Total/NA	Prep	3005A			451804	QTZ5	EET CF	04/17/25 09:00
Total/NA	Analysis	6020B		1	452267	NFT2	EET CF	04/21/25 16:54
Total/NA	Analysis	I-3765-85		1	451561	MDU9	EET CF	04/14/25 15:21
Total/NA	Analysis	SM 2540C		1	451431	XJ7V	EET CF	04/12/25 16:17
Total/NA	Analysis	Field Sampling		1	452990	FQT6	EET CF	04/08/25 15:43

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

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

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: SCS Engineers
Project/Site: Ottumwa Midland Landfill 25225073

Job ID: 310-304085-2

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	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.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

eurofins | Environment Testing America

310-304085 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/14/25 TIME 1630 | Received By. [illegible]

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: DR | 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): 1.8 | Corrected Temp (°C): 1.8

• **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

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: Michael Morgan	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No:
Client Contact: Meghan Blodgett	Phone: 515-631-0778	E-Mail: Sandie.Fredrick@et.eurofinsus.com	State of Origin:	Page: 1 of 1
Company: SCS Engineers	PWSID			Job #:
Address: 2830 Dairy Dr	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-345-9221	PO #:			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Midland LF	Project #: 25225073 00			
Site: Ottumwa Midland LF	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)	6020B - Metals (16)	2540C_Calcd, 9056A_ORGFM_28D, I_3765_85	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N		
MW-125	4/8/25	15:43	G	Water	N		X	X		

Page 18 of 20

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
Michael Morgan	4/11/25 13:30	SCS Engineers	[illegible]	4.11.25 1630	

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

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-304085-2

Login Number: 304085
List Number: 1
Creator: Hirsch, Preston

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	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Groundwater Monitoring Results - Field Parameters
Ottumwa Midland Landfill / SCS Engineers Project #25225073.00
April 2025

Sample	Date	Groundwater Elevation (ft. amsl)	Temperature (Deg. C)	pH (Std. Units)	DO (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity (NTU)
MW-301	4/8/2025	685.29	13.3	6.77	0.42	1,247	49.5	8.83
MW-302	4/9/2025	684.37	14.0	7.15	0.12	1,130	10.0	337.26
MW-303	4/8/2025	685.16	13.1	6.88	0.03	1,332	97.4	105.59
MW-102M	4/8/2025	707.61	14.8	7.67	5.32	3,487	151.5	50.83
MW-122M	4/9/2025	693.35	10.8	6.78	6.42	14,844	256.1	46.95
MW-125	4/8/2025	722.27	12.9	6.64	1.21	2,893	102.8	40.58

Abbreviations:
ft amsl = feet above mean sea level
mg/L = milligrams per liter
µmhos/cm = microhoms per centimeter

Created by: EMS Date: 4/13/2023
Last revision by: BLJ Date: 4/25/2025
Checked by: RM Date: 4/28/2025

C:\Users\FQT6\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\XROCJT5A\[2504_OML_GW_Field Data.xlsx]GW Field Data

Table 1, Page 1 of 1

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 8/22/2025 10:44:51 AM

JOB DESCRIPTION

Ottumwa Midland LF 25225073.00

JOB NUMBER

310-312855-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

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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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job Narrative
310-312855-1

The analytical test results presented in this report meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page, unless otherwise noted. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable. Regulated compliance samples (e.g. SDWA, NPDES) must comply with associated agency requirements/permits.

- Matrix-specific batch QC (e.g., MS, MSD, SD) may not be reported when insufficient sample volume is available or when site-specific QC samples are not submitted. In such cases, a Laboratory Control Sample Duplicate (LCSD) may be analyzed to provide precision data for the batch.
- For samples analyzed using surrogate and/or isotope dilution analytes, any recoveries falling outside of established acceptance criteria are re-prepared and/or re-analyzed to confirm results, unless the deviation is due to sample dilution or otherwise explained in the case narrative.

Receipt
The samples were received on 8/7/2025 3:30 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.6°C, 1.4°C and 4.0°C.

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

Metals
Method 6020B: The method blank for preparation batch 310-463426 and analytical batch 310-463704 contained barium above the method detection limit (MDL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

Method 6020B: The method blank for preparation batch 310-463426 and analytical batch 310-463607 contained barium above the method detection limit (MDL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

Field blank - metals reanalyzed due to hits noted - secondary analysis confirmed.

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.

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

Sample Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Sample Origin
310-312855-1	MW-1R	Water	08/06/25 08:25	08/07/25 15:30	Iowa
310-312855-2	MW-12	Water	08/05/25 15:02	08/07/25 15:30	Iowa
310-312855-3	MW-13	Water	08/05/25 13:02	08/07/25 15:30	Iowa
310-312855-4	MW-14	Water	08/05/25 08:03	08/07/25 15:30	Iowa
310-312855-5	MW-15R	Water	08/05/25 12:29	08/07/25 15:30	Iowa
310-312855-6	MW-16R	Water	08/06/25 12:38	08/07/25 15:30	Iowa
310-312855-7	MW-100R	Water	08/05/25 10:15	08/07/25 15:30	Iowa
310-312855-8	MW-101R	Water	08/06/25 10:43	08/07/25 15:30	Iowa
310-312855-9	MW-102P	Water	08/06/25 08:43	08/07/25 15:30	Iowa
310-312855-10	MW-108	Water	08/05/25 15:23	08/07/25 15:30	Iowa
310-312855-11	MW-125	Water	08/06/25 14:38	08/07/25 15:30	Iowa
310-312855-12	Field Blank	Water	08/06/25 12:55	08/07/25 15:30	Iowa

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-1R — Lab Sample ID: 310-312855-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.53	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	57		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	67		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	100		100	82	ug/L	1		6020B	Total/NA
Calcium	84		0.50	0.19	mg/L	1		6020B	Total/NA
Lithium	29		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	1.7	J	2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	1.4	J	5.0	1.4	ug/L	1		6020B	Total/NA
Magnesium	31000		500	150	ug/L	1		6020B	Total/NA
Total Suspended Solids	1.3	J	1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	470		50	36	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	813.14				ft	1		Field Sampling	Total/NA
Field pH	6.93				SU	1		Field Sampling	Total/NA
Field Conductivity	792				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	18.8				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-12 — Lab Sample ID: 310-312855-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	48		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	2.6		1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	800		50	21	mg/L	50		9056A	Total/NA
Barium	17		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1300		100	82	ug/L	1		6020B	Total/NA
Calcium	13		0.50	0.19	mg/L	1		6020B	Total/NA
Iron	380		100	50	ug/L	1		6020B	Total/NA
Lithium	110		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	1.4	J	2.0	1.3	ug/L	1		6020B	Total/NA
Copper	3.8	J	5.0	3.2	ug/L	1		6020B	Total/NA
Magnesium	5900		500	150	ug/L	1		6020B	Total/NA
Manganese	26		10	3.6	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1700		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.07				ft	1		Field Sampling	Total/NA
Field pH	7.80				SU	1		Field Sampling	Total/NA
Field Conductivity	2551				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	16.0				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-13 — Lab Sample ID: 310-312855-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.85	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	1600		50	21	mg/L	50		9056A	Total/NA
Barium	17		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1900		100	82	ug/L	1		6020B	Total/NA
Calcium	100		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	1.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	250		100	50	ug/L	1		6020B	Total/NA
Lithium	170		10	2.9	ug/L	1		6020B	Total/NA
Magnesium	64000		500	150	ug/L	1		6020B	Total/NA
Manganese	210		10	3.6	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-13 (Continued) — Lab Sample ID: 310-312855-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	2200		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.03				ft	1		Field Sampling	Total/NA
Field pH	7.00				SU	1		Field Sampling	Total/NA
Field Conductivity	3285				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	17.6				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-14 — Lab Sample ID: 310-312855-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.88	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	870		50	21	mg/L	50		9056A	Total/NA
Arsenic	1.2	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	21		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1900		100	82	ug/L	1		6020B	Total/NA
Calcium	63		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.54		0.50	0.17	ug/L	1		6020B	Total/NA
Lithium	140		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	15		2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	2.2	J	5.0	1.4	ug/L	1		6020B	Total/NA
Magnesium	35000		500	150	ug/L	1		6020B	Total/NA
Manganese	140		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	2.0		1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	2000		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.23				ft	1		Field Sampling	Total/NA
Field pH	7.03				SU	1		Field Sampling	Total/NA
Field Conductivity	2917				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	16.5				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-15R — Lab Sample ID: 310-312855-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	10		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	440		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	31	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	550		100	82	ug/L	1		6020B	Total/NA
Calcium	260		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	2.8		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	480		100	50	ug/L	1		6020B	Total/NA
Lithium	69		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	5.0		2.0	1.3	ug/L	1		6020B	Total/NA
Magnesium	120000		2000	600	ug/L	4		6020B	Total/NA
Manganese	570		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	1.8	J	1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	1400		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	760.47				ft	1		Field Sampling	Total/NA
Field pH	6.18				SU	1		Field Sampling	Total/NA
Field Conductivity	2221				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	22.2				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-16R — Lab Sample ID: 310-312855-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	21		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.60	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	900		50	21	mg/L	50		9056A	Total/NA
Barium	37	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1900		100	82	ug/L	1		6020B	Total/NA
Calcium	65		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.82		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	490		100	50	ug/L	1		6020B	Total/NA
Lithium	110		10	2.9	ug/L	1		6020B	Total/NA
Magnesium	38000		500	150	ug/L	1		6020B	Total/NA
Manganese	220		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	1.6	J	1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	2100		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	721.88				ft	1		Field Sampling	Total/NA
Field pH	6.83				SU	1		Field Sampling	Total/NA
Field Conductivity	3093				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	15.0				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-100R — Lab Sample ID: 310-312855-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.46	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	170		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.55	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	41		2.0	0.66	ug/L	1		6020B	Total/NA
Calcium	120		0.50	0.19	mg/L	1		6020B	Total/NA
Lithium	20		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	2.3		2.0	1.3	ug/L	1		6020B	Total/NA
Magnesium	40000		500	150	ug/L	1		6020B	Total/NA
Total Dissolved Solids	640		50	36	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	808.21				ft	1		Field Sampling	Total/NA
Field pH	7.14				SU	1		Field Sampling	Total/NA
Field Conductivity	963				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	22.5				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-101R — Lab Sample ID: 310-312855-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.5		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.44	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	480		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	43	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	750		100	82	ug/L	1		6020B	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.44	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	200		100	50	ug/L	1		6020B	Total/NA
Lithium	78		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	6.4		2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	2.8	J	5.0	1.4	ug/L	1		6020B	Total/NA
Magnesium	68000		500	150	ug/L	1		6020B	Total/NA
Manganese	160		10	3.6	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-101R (Continued) — Lab Sample ID: 310-312855-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	9.9		1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	1000		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	782.40				ft	1		Field Sampling	Total/NA
Field pH	6.82				SU	1		Field Sampling	Total/NA
Field Conductivity	1432				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	14.4				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-102P — Lab Sample ID: 310-312855-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.7		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.69	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	1300		50	21	mg/L	50		9056A	Total/NA
Barium	26	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1500		100	82	ug/L	1		6020B	Total/NA
Calcium	330		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	1.3		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3300		100	50	ug/L	1		6020B	Total/NA
Lithium	190		10	2.9	ug/L	1		6020B	Total/NA
Zinc	18	J	20	13	ug/L	1		6020B	Total/NA
Magnesium	140000		2000	600	ug/L	4		6020B	Total/NA
Manganese	340		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	8.3		5.0	3.5	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	2300		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.41				ft	1		Field Sampling	Total/NA
Field pH	6.38				SU	1		Field Sampling	Total/NA
Field Conductivity	2857				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	18.9				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: MW-108 — Lab Sample ID: 310-312855-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	2.8	J	5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.50	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	140		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	3.4		2.0	0.53	ug/L	1		6020B	Total/NA
Barium	34	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	320		100	82	ug/L	1		6020B	Total/NA
Calcium	65		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	4.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3800		100	50	ug/L	1		6020B	Total/NA
Lithium	47		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	2.5		2.0	1.3	ug/L	1		6020B	Total/NA
Zinc	46		20	13	ug/L	1		6020B	Total/NA
Magnesium	16000		500	150	ug/L	1		6020B	Total/NA
Manganese	790		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	1.3	J	1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	380		50	36	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	741.11				ft	1		Field Sampling	Total/NA
Field pH	6.48				SU	1		Field Sampling	Total/NA
Field Conductivity	599				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	16.8				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-125 — Lab Sample ID: 310-312855-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.65	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	460		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	67	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	2000		100	82	ug/L	1		6020B	Total/NA
Calcium	84		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.53		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	740		100	50	ug/L	1		6020B	Total/NA
Lithium	160		10	2.9	ug/L	1		6020B	Total/NA
Magnesium	44000		500	150	ug/L	1		6020B	Total/NA
Manganese	190		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	3.8		1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	2000		250	180	mg/L	1		SM 2540C	Total/NA
Groundwater Elevation	722.34				ft	1		Field Sampling	Total/NA
Field pH	6.65				SU	1		Field Sampling	Total/NA
Field Conductivity	2929				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	16.4				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: Field Blank — Lab Sample ID: 310-312855-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13		1.0	0.45	mg/L	1		9056A	Total/NA
Fluoride	0.67		0.20	0.075	mg/L	1		9056A	Total/NA
Sulfate	22		1.0	0.42	mg/L	1		9056A	Total/NA
Barium	1.6	J	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	83	J	100	82	ug/L	1		6020B	Total/NA
Calcium	0.36	J	0.50	0.19	mg/L	1		6020B	Total/NA
Zinc	30		20	13	ug/L	1		6020B	Total/NA
Total Dissolved Solids	300		50	36	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-1R

Date Collected: 08/06/25 08:25
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		5.0	2.3	mg/L			08/19/25 12:32	5
Fluoride	0.53	J	1.0	0.38	mg/L			08/19/25 12:32	5
Sulfate	57		5.0	2.1	mg/L			08/19/25 12:32	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/12/25 09:00	08/13/25 13:08	1
Barium	67		2.0	0.66	ug/L		08/12/25 09:00	08/13/25 13:08	1
Beryllium	<0.33		1.0	0.33	ug/L		08/12/25 09:00	08/12/25 17:38	1
Boron	100		100	82	ug/L		08/12/25 09:00	08/13/25 13:08	1
Calcium	84		0.50	0.19	mg/L		08/12/25 09:00	08/13/25 13:08	1
Cobalt	<0.17		0.50	0.17	ug/L		08/12/25 09:00	08/12/25 17:38	1
Iron	<50		100	50	ug/L		08/12/25 09:00	08/12/25 17:38	1
Lead	<0.33		0.50	0.33	ug/L		08/12/25 09:00	08/13/25 13:08	1
Lithium	29		10	2.9	ug/L		08/12/25 09:00	08/12/25 17:38	1
Molybdenum	1.7	J	2.0	1.3	ug/L		08/12/25 09:00	08/13/25 13:08	1
Selenium	1.4	J	5.0	1.4	ug/L		08/12/25 09:00	08/13/25 13:08	1
Copper	<3.2		5.0	3.2	ug/L		08/12/25 09:00	08/12/25 17:38	1
Zinc	<13		20	13	ug/L		08/12/25 09:00	08/12/25 17:38	1
Magnesium	31000		500	150	ug/L		08/12/25 09:00	08/13/25 13:08	1
Manganese	<3.6		10	3.6	ug/L		08/12/25 09:00	08/13/25 13:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	1.3	J	1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	470		50	36	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	813.14				ft			08/06/25 08:25	1
Field pH	6.93				SU			08/06/25 08:25	1
Field Conductivity	792				umhos/cm			08/06/25 08:25	1
Field Temperature	18.8				Degrees C			08/06/25 08:25	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-12

Date Collected: 08/05/25 15:02
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**48**		5.0	2.3	mg/L			08/19/25 12:43	5
Fluoride	**2.6**		1.0	0.38	mg/L			08/19/25 12:43	5
Sulfate	**800**		50	21	mg/L			08/20/25 12:48	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/12/25 09:00	08/13/25 13:11	1
Barium	**17**		2.0	0.66	ug/L		08/12/25 09:00	08/13/25 13:11	1
Beryllium	<0.33		1.0	0.33	ug/L		08/12/25 09:00	08/12/25 17:41	1
Boron	**1300**		100	82	ug/L		08/12/25 09:00	08/13/25 13:11	1
Calcium	**13**		0.50	0.19	mg/L		08/12/25 09:00	08/13/25 13:11	1
Cobalt	<0.17		0.50	0.17	ug/L		08/12/25 09:00	08/12/25 17:41	1
Iron	**380**		100	50	ug/L		08/12/25 09:00	08/12/25 17:41	1
Lead	<0.33		0.50	0.33	ug/L		08/12/25 09:00	08/13/25 13:11	1
Lithium	**110**		10	2.9	ug/L		08/12/25 09:00	08/12/25 17:41	1
Molybdenum	**1.4**	**J**	2.0	1.3	ug/L		08/12/25 09:00	08/13/25 13:11	1
Selenium	<1.4		5.0	1.4	ug/L		08/12/25 09:00	08/13/25 13:11	1
Copper	**3.8**	**J**	5.0	3.2	ug/L		08/12/25 09:00	08/12/25 17:41	1
Zinc	<13		20	13	ug/L		08/12/25 09:00	08/12/25 17:41	1
Magnesium	**5900**		500	150	ug/L		08/12/25 09:00	08/13/25 13:11	1
Manganese	**26**		10	3.6	ug/L		08/12/25 09:00	08/13/25 13:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.3		1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	**1700**		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**722.07**				ft			08/05/25 15:02	1
Field pH	**7.80**				SU			08/05/25 15:02	1
Field Conductivity	**2551**				umhos/cm			08/05/25 15:02	1
Field Temperature	**16.0**				Degrees C			08/05/25 15:02	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-13

Date Collected: 08/05/25 13:02
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**13**		5.0	2.3	mg/L			08/19/25 12:55	5
Fluoride	**0.85**	**J**	1.0	0.38	mg/L			08/19/25 12:55	5
Sulfate	**1600**		50	21	mg/L			08/20/25 12:59	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:40	1
Barium	**17**		2.0	0.66	ug/L		08/21/25 09:00	08/21/25 17:32	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:40	1
Boron	**1900**		100	82	ug/L		08/13/25 09:30	08/13/25 17:40	1
Calcium	**100**		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:40	1
Cobalt	**1.2**		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:40	1
Iron	**250**		100	50	ug/L		08/13/25 09:30	08/13/25 17:40	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:40	1
Lithium	**170**		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:40	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:40	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:40	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:40	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:40	1
Magnesium	**64000**		500	150	ug/L		08/13/25 09:30	08/13/25 17:40	1
Manganese	**210**		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.3		1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	**2200**		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**722.03**				ft			08/05/25 13:02	1
Field pH	**7.00**				SU			08/05/25 13:02	1
Field Conductivity	**3285**				umhos/cm			08/05/25 13:02	1
Field Temperature	**17.6**				Degrees C			08/05/25 13:02	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-14

Date Collected: 08/05/25 08:03
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	20		5.0	2.3	mg/L			08/19/25 13:06	5
Fluoride	0.88	J	1.0	0.38	mg/L			08/19/25 13:06	5
Sulfate	870		50	21	mg/L			08/20/25 13:11	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2	J	2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:43	1
Barium	21		2.0	0.66	ug/L		08/21/25 09:00	08/21/25 17:40	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:43	1
Boron	1900		100	82	ug/L		08/13/25 09:30	08/13/25 17:43	1
Calcium	63		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:43	1
Cobalt	0.54		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:43	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 17:43	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:43	1
Lithium	140		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:43	1
Molybdenum	15		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:43	1
Selenium	2.2	J	5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:43	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:43	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:43	1
Magnesium	35000		500	150	ug/L		08/13/25 09:30	08/13/25 17:43	1
Manganese	140		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	2.0		1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	2000		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	722.23				ft			08/05/25 08:03	1
Field pH	7.03				SU			08/05/25 08:03	1
Field Conductivity	2917				umhos/cm			08/05/25 08:03	1
Field Temperature	16.5				Degrees C			08/05/25 08:03	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-15R

Date Collected: 08/05/25 12:29
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10**		5.0	2.3	mg/L			08/19/25 13:18	5
Fluoride	<0.38		1.0	0.38	mg/L			08/19/25 13:18	5
Sulfate	**440**		5.0	2.1	mg/L			08/19/25 13:18	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:46	1
Barium	**31**	**B**	2.0	0.66	ug/L		08/13/25 09:30	08/13/25 17:46	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:46	1
Boron	**550**		100	82	ug/L		08/13/25 09:30	08/13/25 17:46	1
Calcium	**260**		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:46	1
Cobalt	**2.8**		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:46	1
Iron	**480**		100	50	ug/L		08/13/25 09:30	08/13/25 17:46	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:46	1
Lithium	**69**		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:46	1
Molybdenum	**5.0**		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:46	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:46	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:46	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:46	1
Magnesium	**120000**		2000	600	ug/L		08/13/25 09:30	08/14/25 14:13	4
Manganese	**570**		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.8**	**J**	1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	**1400**		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**760.47**				ft			08/05/25 12:29	1
Field pH	**6.18**				SU			08/05/25 12:29	1
Field Conductivity	**2221**				umhos/cm			08/05/25 12:29	1
Field Temperature	**22.2**				Degrees C			08/05/25 12:29	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-16R

Date Collected: 08/06/25 12:38
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-6

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21		5.0	2.3	mg/L			08/19/25 13:30	5
Fluoride	0.60	J	1.0	0.38	mg/L			08/19/25 13:30	5
Sulfate	900		50	21	mg/L			08/20/25 13:23	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:48	1
Barium	37	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:16	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:48	1
Boron	1900		100	82	ug/L		08/13/25 09:30	08/13/25 17:48	1
Calcium	65		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:48	1
Cobalt	0.82		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:48	1
Iron	490		100	50	ug/L		08/13/25 09:30	08/13/25 17:48	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:48	1
Lithium	110		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:48	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:48	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:48	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:48	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:48	1
Magnesium	38000		500	150	ug/L		08/13/25 09:30	08/13/25 17:48	1
Manganese	220		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	1.6	J	1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	2100		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	721.88				ft			08/06/25 12:38	1
Field pH	6.83				SU			08/06/25 12:38	1
Field Conductivity	3093				umhos/cm			08/06/25 12:38	1
Field Temperature	15.0				Degrees C			08/06/25 12:38	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-100R

Date Collected: 08/05/25 10:15
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**		5.0	2.3	mg/L			08/19/25 13:41	5
Fluoride	**0.46**	**J**	1.0	0.38	mg/L			08/19/25 13:41	5
Sulfate	**170**		5.0	2.1	mg/L			08/19/25 13:41	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.55**	**J**	2.0	0.53	ug/L		08/11/25 09:30	08/11/25 17:35	1
Barium	**41**		2.0	0.66	ug/L		08/11/25 09:30	08/11/25 17:35	1
Beryllium	<0.33		1.0	0.33	ug/L		08/11/25 09:30	08/11/25 17:35	1
Boron	<82		100	82	ug/L		08/11/25 09:30	08/13/25 15:01	1
Calcium	**120**		0.50	0.19	mg/L		08/11/25 09:30	08/11/25 17:35	1
Cobalt	<0.17		0.50	0.17	ug/L		08/11/25 09:30	08/11/25 17:35	1
Iron	<50		100	50	ug/L		08/11/25 09:30	08/11/25 17:35	1
Lead	<0.33		0.50	0.33	ug/L		08/11/25 09:30	08/13/25 15:01	1
Lithium	**20**		10	2.9	ug/L		08/11/25 09:30	08/11/25 17:35	1
Molybdenum	**2.3**		2.0	1.3	ug/L		08/11/25 09:30	08/11/25 17:35	1
Selenium	<1.4		5.0	1.4	ug/L		08/11/25 09:30	08/11/25 17:35	1
Copper	<3.2		5.0	3.2	ug/L		08/11/25 09:30	08/13/25 15:01	1
Zinc	<13		20	13	ug/L		08/11/25 09:30	08/11/25 17:35	1
Magnesium	**40000**		500	150	ug/L		08/11/25 09:30	08/11/25 17:35	1
Manganese	<3.6		10	3.6	ug/L		08/11/25 09:30	08/11/25 17:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.3		1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	**640**		50	36	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**808.21**				ft			08/05/25 10:15	1
Field pH	**7.14**				SU			08/05/25 10:15	1
Field Conductivity	**963**				umhos/cm			08/05/25 10:15	1
Field Temperature	**22.5**				Degrees C			08/05/25 10:15	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-101R

Date Collected: 08/06/25 10:43
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-8

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.5		5.0	2.3	mg/L			08/19/25 13:53	5
Fluoride	0.44	J	1.0	0.38	mg/L			08/19/25 13:53	5
Sulfate	480		5.0	2.1	mg/L			08/19/25 13:53	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:51	1
Barium	43	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:18	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:51	1
Boron	750		100	82	ug/L		08/13/25 09:30	08/13/25 17:51	1
Calcium	180		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:51	1
Cobalt	0.44	J	0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:51	1
Iron	200		100	50	ug/L		08/13/25 09:30	08/13/25 17:51	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:51	1
Lithium	78		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:51	1
Molybdenum	6.4		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:51	1
Selenium	2.8	J	5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:51	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:51	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:51	1
Magnesium	68000		500	150	ug/L		08/13/25 09:30	08/13/25 17:51	1
Manganese	160		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	9.9		1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	1000		250	180	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	782.40				ft			08/06/25 10:43	1
Field pH	6.82				SU			08/06/25 10:43	1
Field Conductivity	1432				umhos/cm			08/06/25 10:43	1
Field Temperature	14.4				Degrees C			08/06/25 10:43	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-102P

Date Collected: 08/06/25 08:43
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-9

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.7		5.0	2.3	mg/L			08/19/25 14:04	5
Fluoride	0.69	J	1.0	0.38	mg/L			08/19/25 14:04	5
Sulfate	1300		50	21	mg/L			08/20/25 13:34	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:53	1
Barium	26	B	2.0	0.66	ug/L		08/13/25 09:30	08/13/25 17:53	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:53	1
Boron	1500		100	82	ug/L		08/13/25 09:30	08/13/25 17:53	1
Calcium	330		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:53	1
Cobalt	1.3		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:53	1
Iron	3300		100	50	ug/L		08/13/25 09:30	08/13/25 17:53	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:53	1
Lithium	190		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:53	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:53	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:53	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:53	1
Zinc	18	J	20	13	ug/L		08/13/25 09:30	08/13/25 17:53	1
Magnesium	140000		2000	600	ug/L		08/13/25 09:30	08/14/25 14:21	4
Manganese	340		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	8.3		5.0	3.5	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	2300		250	180	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	722.41				ft			08/06/25 08:43	1
Field pH	6.38				SU			08/06/25 08:43	1
Field Conductivity	2857				umhos/cm			08/06/25 08:43	1
Field Temperature	18.9				Degrees C			08/06/25 08:43	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-108

Date Collected: 08/05/25 15:23
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-10

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.8	J	5.0	2.3	mg/L			08/19/25 14:39	5
Fluoride	0.50	J	1.0	0.38	mg/L			08/19/25 14:39	5
Sulfate	140		5.0	2.1	mg/L			08/19/25 14:39	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.4		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:56	1
Barium	34	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:23	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:56	1
Boron	320		100	82	ug/L		08/13/25 09:30	08/13/25 17:56	1
Calcium	65		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:56	1
Cobalt	4.2		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:56	1
Iron	3800		100	50	ug/L		08/13/25 09:30	08/13/25 17:56	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:56	1
Lithium	47		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:56	1
Molybdenum	2.5		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:56	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:56	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:56	1
Zinc	46		20	13	ug/L		08/13/25 09:30	08/13/25 17:56	1
Magnesium	16000		500	150	ug/L		08/13/25 09:30	08/13/25 17:56	1
Manganese	790		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	1.3	J	1.9	1.3	mg/L			08/08/25 09:51	1
Total Dissolved Solids (SM 2540C)	380		50	36	mg/L			08/08/25 21:39	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	741.11				ft			08/05/25 15:23	1
Field pH	6.48				SU			08/05/25 15:23	1
Field Conductivity	599				umhos/cm			08/05/25 15:23	1
Field Temperature	16.8				Degrees C			08/05/25 15:23	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-125

Date Collected: 08/06/25 14:38
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-11

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16		5.0	2.3	mg/L			08/19/25 14:51	5
Fluoride	0.65	J	1.0	0.38	mg/L			08/19/25 14:51	5
Sulfate	460		5.0	2.1	mg/L			08/19/25 14:51	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:06	1
Barium	67	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:29	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:06	1
Boron	2000		100	82	ug/L		08/13/25 09:30	08/13/25 18:06	1
Calcium	84		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:06	1
Cobalt	0.53		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:06	1
Iron	740		100	50	ug/L		08/13/25 09:30	08/13/25 18:06	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:06	1
Lithium	160		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:06	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:06	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:06	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:06	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 18:06	1
Magnesium	44000		500	150	ug/L		08/13/25 09:30	08/13/25 18:06	1
Manganese	190		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	3.8		1.9	1.3	mg/L			08/08/25 09:51	1
Total Dissolved Solids (SM 2540C)	2000		250	180	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	722.34				ft			08/06/25 14:38	1
Field pH	6.65				SU			08/06/25 14:38	1
Field Conductivity	2929				umhos/cm			08/06/25 14:38	1
Field Temperature	16.4				Degrees C			08/06/25 14:38	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: Field Blank

Lab Sample ID: 310-312855-12

Date Collected: 08/06/25 12:55
Date Received: 08/07/25 15:30

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**13**		1.0	0.45	mg/L			08/20/25 13:46	1
Fluoride	**0.67**		0.20	0.075	mg/L			08/20/25 13:46	1
Sulfate	**22**		1.0	0.42	mg/L			08/20/25 13:46	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:09	1
Barium	**1.6**	**J**	2.0	0.66	ug/L		08/21/25 09:00	08/21/25 17:43	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:09	1
Boron	**83**	**J**	100	82	ug/L		08/13/25 09:30	08/13/25 18:09	1
Calcium	**0.36**	**J**	0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:09	1
Cobalt	<0.17		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:09	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 18:09	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:09	1
Lithium	<2.9		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:09	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:09	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:09	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:09	1
Zinc	**30**		20	13	ug/L		08/13/25 09:30	08/13/25 18:09	1
Magnesium	<150		500	150	ug/L		08/13/25 09:30	08/13/25 18:09	1
Manganese	<3.6		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.3		1.9	1.3	mg/L			08/08/25 09:51	1
Total Dissolved Solids (SM 2540C)	**300**		50	36	mg/L			08/11/25 11:49	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-312855-1
Project/Site: Ottumwa Midland LF 25225073.00

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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 310-464334/3
Matrix: Water
Analysis Batch: 464334

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			08/19/25 10:59	1
Fluoride	<0.075		0.20	0.075	mg/L			08/19/25 10:59	1
Sulfate	<0.42		1.0	0.42	mg/L			08/19/25 10:59	1

Lab Sample ID: LCS 310-464334/4
Matrix: Water
Analysis Batch: 464334

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	9.69		mg/L		97	90 - 110
Sulfate	10.0	10.0		mg/L		100	90 - 110

Lab Sample ID: LCS 310-464334/45
Matrix: Water
Analysis Batch: 464334

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	1.94		mg/L		97	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-463153/1-A
Matrix: Water
Analysis Batch: 463365

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 463153

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/11/25 09:30	08/11/25 17:12	1
Barium	<0.66		2.0	0.66	ug/L		08/11/25 09:30	08/11/25 17:12	1
Beryllium	<0.33		1.0	0.33	ug/L		08/11/25 09:30	08/11/25 17:12	1
Calcium	<0.19		0.50	0.19	mg/L		08/11/25 09:30	08/11/25 17:12	1
Cobalt	<0.17		0.50	0.17	ug/L		08/11/25 09:30	08/11/25 17:12	1
Iron	<50		100	50	ug/L		08/11/25 09:30	08/11/25 17:12	1
Lithium	<2.9		10	2.9	ug/L		08/11/25 09:30	08/11/25 17:12	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/11/25 09:30	08/11/25 17:12	1
Selenium	<1.4		5.0	1.4	ug/L		08/11/25 09:30	08/11/25 17:12	1
Zinc	<13		20	13	ug/L		08/11/25 09:30	08/11/25 17:12	1
Magnesium	<150		500	150	ug/L		08/11/25 09:30	08/11/25 17:12	1
Manganese	<3.6		10	3.6	ug/L		08/11/25 09:30	08/11/25 17:12	1

Lab Sample ID: MB 310-463153/1-A
Matrix: Water
Analysis Batch: 463607

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 463153

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<82		100	82	ug/L		08/11/25 09:30	08/13/25 14:48	1
Lead	<0.33		0.50	0.33	ug/L		08/11/25 09:30	08/13/25 14:48	1
Copper	<3.2		5.0	3.2	ug/L		08/11/25 09:30	08/13/25 14:48	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-463153/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463365 — **Prep Batch: 463153**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	195		ug/L		98	80 - 120
Barium	100	92.9		ug/L		93	80 - 120
Beryllium	100	88.5		ug/L		89	80 - 120
Calcium	2.00	1.76		mg/L		88	80 - 120
Cobalt	100	98.4		ug/L		98	80 - 120
Iron	200	219		ug/L		109	80 - 120
Lithium	200	185		ug/L		93	80 - 120
Molybdenum	200	195		ug/L		97	80 - 120
Selenium	400	360		ug/L		90	80 - 120
Zinc	200	211		ug/L		105	80 - 120
Magnesium	2000	1990		ug/L		99	80 - 120
Manganese	100	88.6		ug/L		89	80 - 120

Lab Sample ID: LCS 310-463153/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463153**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	202		ug/L		101	80 - 120
Lead	200	176		ug/L		88	80 - 120
Copper	200	185		ug/L		92	80 - 120

Lab Sample ID: MB 310-463285/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463463 — **Prep Batch: 463285**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/12/25 09:00	08/12/25 16:09	1
Barium	<0.66		2.0	0.66	ug/L		08/12/25 09:00	08/12/25 16:09	1
Beryllium	<0.33		1.0	0.33	ug/L		08/12/25 09:00	08/12/25 16:09	1
Calcium	<0.19		0.50	0.19	mg/L		08/12/25 09:00	08/12/25 16:09	1
Cobalt	<0.17		0.50	0.17	ug/L		08/12/25 09:00	08/12/25 16:09	1
Iron	<50		100	50	ug/L		08/12/25 09:00	08/12/25 16:09	1
Lead	<0.33		0.50	0.33	ug/L		08/12/25 09:00	08/12/25 16:09	1
Lithium	<2.9		10	2.9	ug/L		08/12/25 09:00	08/12/25 16:09	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/12/25 09:00	08/12/25 16:09	1
Selenium	<1.4		5.0	1.4	ug/L		08/12/25 09:00	08/12/25 16:09	1
Copper	<3.2		5.0	3.2	ug/L		08/12/25 09:00	08/12/25 16:09	1
Zinc	<13		20	13	ug/L		08/12/25 09:00	08/12/25 16:09	1
Magnesium	<150		500	150	ug/L		08/12/25 09:00	08/12/25 16:09	1
Manganese	<3.6		10	3.6	ug/L		08/12/25 09:00	08/12/25 16:09	1

Lab Sample ID: MB 310-463285/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463551 — **Prep Batch: 463285**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<82		100	82	ug/L		08/12/25 09:00	08/13/25 12:13	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-463285/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463463 — **Prep Batch: 463285**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	210		ug/L		105	80 - 120
Barium	100	100		ug/L		100	80 - 120
Beryllium	100	101		ug/L		101	80 - 120
Calcium	2.00	1.96		mg/L		98	80 - 120
Cobalt	100	97.8		ug/L		98	80 - 120
Iron	200	224		ug/L		112	80 - 120
Lead	200	209		ug/L		105	80 - 120
Lithium	200	209		ug/L		105	80 - 120
Molybdenum	200	212		ug/L		106	80 - 120
Selenium	400	379		ug/L		95	80 - 120
Copper	200	203		ug/L		101	80 - 120
Zinc	200	198		ug/L		99	80 - 120
Magnesium	2000	1960		ug/L		98	80 - 120
Manganese	100	99.1		ug/L		99	80 - 120

Lab Sample ID: LCS 310-463285/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463551 — **Prep Batch: 463285**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	188		ug/L		94	80 - 120

Lab Sample ID: MB 310-463426/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463426**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:12	1
Barium	2.16		2.0	0.66	ug/L		08/13/25 09:30	08/13/25 17:12	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:12	1
Boron	<82		100	82	ug/L		08/13/25 09:30	08/13/25 17:12	1
Calcium	<0.19		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:12	1
Cobalt	<0.17		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:12	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 17:12	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:12	1
Lithium	<2.9		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:12	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:12	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:12	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:12	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:12	1
Magnesium	<150		500	150	ug/L		08/13/25 09:30	08/13/25 17:12	1
Manganese	<3.6		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:12	1

Lab Sample ID: MB 310-463426/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463704 — **Prep Batch: 463426**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	1.37	J	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:54	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-463426/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463426**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	200		ug/L		100	80 - 120
Barium	100	99.2		ug/L		99	80 - 120
Beryllium	100	97.5		ug/L		98	80 - 120
Boron	200	198		ug/L		99	80 - 120
Calcium	2.00	1.87		mg/L		94	80 - 120
Cobalt	100	100		ug/L		100	80 - 120
Iron	200	218		ug/L		109	80 - 120
Lead	200	194		ug/L		97	80 - 120
Lithium	200	194		ug/L		97	80 - 120
Molybdenum	200	198		ug/L		99	80 - 120
Selenium	400	373		ug/L		93	80 - 120
Copper	200	206		ug/L		103	80 - 120
Zinc	200	190		ug/L		95	80 - 120
Magnesium	2000	2110		ug/L		105	80 - 120
Manganese	100	99.3		ug/L		99	80 - 120

Lab Sample ID: LCS 310-463426/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463704 — **Prep Batch: 463426**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	100	97.4		ug/L		97	80 - 120

Lab Sample ID: 310-312855-10 DU — **Client Sample ID: MW-108**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463426**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	3.4		3.36		ug/L		0	20
Beryllium	<0.33		<0.33		ug/L		NC	20
Boron	320		303		ug/L		5	20
Calcium	65		65.2		mg/L		0.8	20
Cobalt	4.2		4.63		ug/L		10	20
Iron	3800		3870		ug/L		2	20
Lead	<0.33		<0.33		ug/L		NC	20
Lithium	47		45.7		ug/L		2	20
Molybdenum	2.5		2.74		ug/L		9	20
Selenium	<1.4		<1.4		ug/L		NC	20
Copper	<3.2		<3.2		ug/L		NC	20
Zinc	46		50.0		ug/L		7	20
Magnesium	16000		16000		ug/L		1	20
Manganese	790		798		ug/L		2	20

Lab Sample ID: 310-312855-10 DU — **Client Sample ID: MW-108**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463704 — **Prep Batch: 463426**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Barium	34	B	33.6		ug/L		0.5	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-464280/1-A
Matrix: Water
Analysis Batch: 464444

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 464280

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/21/25 09:00	08/21/25 17:17	1
Barium	<0.66		2.0	0.66	ug/L		08/21/25 09:00	08/21/25 17:17	1
Beryllium	<0.33		1.0	0.33	ug/L		08/21/25 09:00	08/21/25 17:17	1
Boron	<82		100	82	ug/L		08/21/25 09:00	08/21/25 17:17	1
Calcium	<0.19		0.50	0.19	mg/L		08/21/25 09:00	08/21/25 17:17	1
Cobalt	<0.17		0.50	0.17	ug/L		08/21/25 09:00	08/21/25 17:17	1
Iron	<50		100	50	ug/L		08/21/25 09:00	08/21/25 17:17	1
Lead	<0.33		0.50	0.33	ug/L		08/21/25 09:00	08/21/25 17:17	1
Lithium	<2.9		10	2.9	ug/L		08/21/25 09:00	08/21/25 17:17	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/21/25 09:00	08/21/25 17:17	1
Selenium	<1.4		5.0	1.4	ug/L		08/21/25 09:00	08/21/25 17:17	1
Copper	<3.2		5.0	3.2	ug/L		08/21/25 09:00	08/21/25 17:17	1
Zinc	<13		20	13	ug/L		08/21/25 09:00	08/21/25 17:17	1
Magnesium	<150		500	150	ug/L		08/21/25 09:00	08/21/25 17:17	1
Manganese	<3.6		10	3.6	ug/L		08/21/25 09:00	08/21/25 17:17	1

Lab Sample ID: LCS 310-464280/2-A
Matrix: Water
Analysis Batch: 464444

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 464280

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	188		ug/L		94	80 - 120
Barium	100	90.5		ug/L		91	80 - 120
Beryllium	100	86.0		ug/L		86	80 - 120
Boron	200	181		ug/L		91	80 - 120
Cobalt	100	93.1		ug/L		93	80 - 120
Iron	200	206		ug/L		103	80 - 120
Lead	200	182		ug/L		91	80 - 120
Lithium	200	171		ug/L		86	80 - 120
Molybdenum	200	190		ug/L		95	80 - 120
Selenium	400	350		ug/L		88	80 - 120
Copper	200	196		ug/L		98	80 - 120
Zinc	200	174		ug/L		87	80 - 120
Magnesium	2000	1870		ug/L		93	80 - 120
Manganese	100	88.5		ug/L		88	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-463054/1
Matrix: Water
Analysis Batch: 463054

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			08/08/25 09:51	1

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: LCS 310-463054/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463054

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	95.0		mg/L		95	82 - 117

Lab Sample ID: MB 310-463066/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463066

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			08/08/25 11:04	1

Lab Sample ID: LCS 310-463066/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463066

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	100		mg/L		100	82 - 117

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

Lab Sample ID: MB 310-463157/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463157

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<36		50	36	mg/L			08/08/25 21:39	1

Lab Sample ID: LCS 310-463157/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463157

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1010		mg/L		101	89 - 110

Lab Sample ID: 310-312855-4 DU — **Client Sample ID: MW-14**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463157

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	2000		1900		mg/L		6	13

Lab Sample ID: MB 310-463243/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463243

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<36		50	36	mg/L			08/11/25 11:49	1

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

Lab Sample ID: LCS 310-463243/2
Matrix: Water
Analysis Batch: 463243

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	1030		mg/L		103	89 - 110		

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

HPLC/IC

Analysis Batch: 464334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	9056A	
310-312855-2	MW-12	Total/NA	Water	9056A	
310-312855-2	MW-12	Total/NA	Water	9056A	
310-312855-3	MW-13	Total/NA	Water	9056A	
310-312855-3	MW-13	Total/NA	Water	9056A	
310-312855-4	MW-14	Total/NA	Water	9056A	
310-312855-4	MW-14	Total/NA	Water	9056A	
310-312855-5	MW-15R	Total/NA	Water	9056A	
310-312855-6	MW-16R	Total/NA	Water	9056A	
310-312855-6	MW-16R	Total/NA	Water	9056A	
310-312855-7	MW-100R	Total/NA	Water	9056A	
310-312855-8	MW-101R	Total/NA	Water	9056A	
310-312855-9	MW-102P	Total/NA	Water	9056A	
310-312855-9	MW-102P	Total/NA	Water	9056A	
310-312855-10	MW-108	Total/NA	Water	9056A	
310-312855-11	MW-125	Total/NA	Water	9056A	
310-312855-12	Field Blank	Total/NA	Water	9056A	
MB 310-464334/3	Method Blank	Total/NA	Water	9056A	
LCS 310-464334/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-464334/45	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 463153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-7	MW-100R	Total/NA	Water	3005A	
MB 310-463153/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-463153/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 463285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	3005A	
310-312855-2	MW-12	Total/NA	Water	3005A	
MB 310-463285/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-463285/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 463365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-7	MW-100R	Total/NA	Water	6020B	463153
MB 310-463153/1-A	Method Blank	Total/NA	Water	6020B	463153
LCS 310-463153/2-A	Lab Control Sample	Total/NA	Water	6020B	463153

Prep Batch: 463426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-3	MW-13	Total/NA	Water	3005A	
310-312855-4	MW-14	Total/NA	Water	3005A	
310-312855-5	MW-15R	Total/NA	Water	3005A	
310-312855-6	MW-16R	Total/NA	Water	3005A	
310-312855-8	MW-101R	Total/NA	Water	3005A	
310-312855-9	MW-102P	Total/NA	Water	3005A	
310-312855-10	MW-108	Total/NA	Water	3005A	

Metals (Continued)

Prep Batch: 463426 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-11	MW-125	Total/NA	Water	3005A	
310-312855-12	Field Blank	Total/NA	Water	3005A	
MB 310-463426/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-312855-10 DU	MW-108	Total/NA	Water	3005A	

Analysis Batch: 463463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	6020B	463285
310-312855-2	MW-12	Total/NA	Water	6020B	463285
MB 310-463285/1-A	Method Blank	Total/NA	Water	6020B	463285
LCS 310-463285/2-A	Lab Control Sample	Total/NA	Water	6020B	463285

Analysis Batch: 463551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	6020B	463285
310-312855-2	MW-12	Total/NA	Water	6020B	463285
MB 310-463285/1-A	Method Blank	Total/NA	Water	6020B	463285
LCS 310-463285/2-A	Lab Control Sample	Total/NA	Water	6020B	463285

Analysis Batch: 463607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-3	MW-13	Total/NA	Water	6020B	463426
310-312855-4	MW-14	Total/NA	Water	6020B	463426
310-312855-5	MW-15R	Total/NA	Water	6020B	463426
310-312855-6	MW-16R	Total/NA	Water	6020B	463426
310-312855-7	MW-100R	Total/NA	Water	6020B	463153
310-312855-8	MW-101R	Total/NA	Water	6020B	463426
310-312855-9	MW-102P	Total/NA	Water	6020B	463426
310-312855-10	MW-108	Total/NA	Water	6020B	463426
310-312855-11	MW-125	Total/NA	Water	6020B	463426
310-312855-12	Field Blank	Total/NA	Water	6020B	463426
MB 310-463153/1-A	Method Blank	Total/NA	Water	6020B	463153
MB 310-463426/1-A	Method Blank	Total/NA	Water	6020B	463426
LCS 310-463153/2-A	Lab Control Sample	Total/NA	Water	6020B	463153
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	6020B	463426
310-312855-10 DU	MW-108	Total/NA	Water	6020B	463426

Analysis Batch: 463704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-5	MW-15R	Total/NA	Water	6020B	463426
310-312855-6	MW-16R	Total/NA	Water	6020B	463426
310-312855-8	MW-101R	Total/NA	Water	6020B	463426
310-312855-9	MW-102P	Total/NA	Water	6020B	463426
310-312855-10	MW-108	Total/NA	Water	6020B	463426
310-312855-11	MW-125	Total/NA	Water	6020B	463426
MB 310-463426/1-A	Method Blank	Total/NA	Water	6020B	463426
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	6020B	463426
310-312855-10 DU	MW-108	Total/NA	Water	6020B	463426

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Metals

Prep Batch: 464280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-3	MW-13	Total/NA	Water	3005A	
310-312855-4	MW-14	Total/NA	Water	3005A	
310-312855-12	Field Blank	Total/NA	Water	3005A	
MB 310-464280/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-464280/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 464444

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-3	MW-13	Total/NA	Water	6020B	464280
310-312855-4	MW-14	Total/NA	Water	6020B	464280
310-312855-12	Field Blank	Total/NA	Water	6020B	464280
MB 310-464280/1-A	Method Blank	Total/NA	Water	6020B	464280
LCS 310-464280/2-A	Lab Control Sample	Total/NA	Water	6020B	464280

General Chemistry

Analysis Batch: 463054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-10	MW-108	Total/NA	Water	I-3765-85	
310-312855-11	MW-125	Total/NA	Water	I-3765-85	
310-312855-12	Field Blank	Total/NA	Water	I-3765-85	
MB 310-463054/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-463054/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 463066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	I-3765-85	
310-312855-2	MW-12	Total/NA	Water	I-3765-85	
310-312855-3	MW-13	Total/NA	Water	I-3765-85	
310-312855-4	MW-14	Total/NA	Water	I-3765-85	
310-312855-5	MW-15R	Total/NA	Water	I-3765-85	
310-312855-6	MW-16R	Total/NA	Water	I-3765-85	
310-312855-7	MW-100R	Total/NA	Water	I-3765-85	
310-312855-8	MW-101R	Total/NA	Water	I-3765-85	
310-312855-9	MW-102P	Total/NA	Water	I-3765-85	
MB 310-463066/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-463066/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 463157

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	SM 2540C	
310-312855-2	MW-12	Total/NA	Water	SM 2540C	
310-312855-3	MW-13	Total/NA	Water	SM 2540C	
310-312855-4	MW-14	Total/NA	Water	SM 2540C	
310-312855-5	MW-15R	Total/NA	Water	SM 2540C	
310-312855-6	MW-16R	Total/NA	Water	SM 2540C	
310-312855-7	MW-100R	Total/NA	Water	SM 2540C	
310-312855-8	MW-101R	Total/NA	Water	SM 2540C	
310-312855-10	MW-108	Total/NA	Water	SM 2540C	
MB 310-463157/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-463157/2	Lab Control Sample	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 463157 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-4 DU	MW-14	Total/NA	Water	SM 2540C	

Analysis Batch: 463243

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-9	MW-102P	Total/NA	Water	SM 2540C	
310-312855-11	MW-125	Total/NA	Water	SM 2540C	
310-312855-12	Field Blank	Total/NA	Water	SM 2540C	
MB 310-463243/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-463243/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 463689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-1	MW-1R	Total/NA	Water	Field Sampling	
310-312855-2	MW-12	Total/NA	Water	Field Sampling	
310-312855-3	MW-13	Total/NA	Water	Field Sampling	
310-312855-4	MW-14	Total/NA	Water	Field Sampling	
310-312855-5	MW-15R	Total/NA	Water	Field Sampling	
310-312855-6	MW-16R	Total/NA	Water	Field Sampling	
310-312855-7	MW-100R	Total/NA	Water	Field Sampling	
310-312855-8	MW-101R	Total/NA	Water	Field Sampling	
310-312855-9	MW-102P	Total/NA	Water	Field Sampling	
310-312855-10	MW-108	Total/NA	Water	Field Sampling	
310-312855-11	MW-125	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-1R
Date Collected: 08/06/25 08:25
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 12:32
Total/NA	Prep	3005A			463285	WK2X	EET CF	08/12/25 09:00
Total/NA	Analysis	6020B		1	463463	NFT2	EET CF	08/12/25 17:38
Total/NA	Prep	3005A			463285	WK2X	EET CF	08/12/25 09:00
Total/NA	Analysis	6020B		1	463551	NFT2	EET CF	08/13/25 13:08
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 08:25

Client Sample ID: MW-12
Date Collected: 08/05/25 15:02
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 12:43
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 12:48
Total/NA	Prep	3005A			463285	WK2X	EET CF	08/12/25 09:00
Total/NA	Analysis	6020B		1	463463	NFT2	EET CF	08/12/25 17:41
Total/NA	Prep	3005A			463285	WK2X	EET CF	08/12/25 09:00
Total/NA	Analysis	6020B		1	463551	NFT2	EET CF	08/13/25 13:11
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 15:02

Client Sample ID: MW-13
Date Collected: 08/05/25 13:02
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 12:55
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 12:59
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:40
Total/NA	Prep	3005A			464280	WK2X	EET CF	08/21/25 09:00
Total/NA	Analysis	6020B		1	464444	NFT2	EET CF	08/21/25 17:32
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 13:02

Client Sample ID: MW-14

Lab Sample ID: 310-312855-4
Matrix: Water

Date Collected: 08/05/25 08:03
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 13:06
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 13:11
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:43
Total/NA	Prep	3005A			464280	WK2X	EET CF	08/21/25 09:00
Total/NA	Analysis	6020B		1	464444	NFT2	EET CF	08/21/25 17:40
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 08:03

Client Sample ID: MW-15R

Lab Sample ID: 310-312855-5
Matrix: Water

Date Collected: 08/05/25 12:29
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 13:18
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:46
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		4	463704	NFT2	EET CF	08/14/25 14:13
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 12:29

Client Sample ID: MW-16R

Lab Sample ID: 310-312855-6
Matrix: Water

Date Collected: 08/06/25 12:38
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 13:30
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 13:23
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:48
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:16
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 12:38

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-100R
Lab Sample ID: 310-312855-7
Date Collected: 08/05/25 10:15
Matrix: Water
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 13:41
Total/NA	Prep	3005A			463153	QTZ5	EET CF	08/11/25 09:30
Total/NA	Analysis	6020B		1	463365	NFT2	EET CF	08/11/25 17:35
Total/NA	Prep	3005A			463153	QTZ5	EET CF	08/11/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 15:01
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 10:15

Client Sample ID: MW-101R
Lab Sample ID: 310-312855-8
Date Collected: 08/06/25 10:43
Matrix: Water
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 13:53
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:51
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:18
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 10:43

Client Sample ID: MW-102P
Lab Sample ID: 310-312855-9
Date Collected: 08/06/25 08:43
Matrix: Water
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 14:04
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 13:34
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:53
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		4	463704	NFT2	EET CF	08/14/25 14:21
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 08:43

Client Sample ID: MW-108
Lab Sample ID: 310-312855-10
Date Collected: 08/05/25 15:23
Matrix: Water
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 14:39

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Client Sample ID: MW-108

Lab Sample ID: 310-312855-10
Matrix: Water

Date Collected: 08/05/25 15:23
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 17:56
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:23
Total/NA	Analysis	I-3765-85		1	463054	E6KR	EET CF	08/08/25 09:51
Total/NA	Analysis	SM 2540C		1	463157	MDU9	EET CF	08/08/25 21:39
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/05/25 15:23

Client Sample ID: MW-125

Lab Sample ID: 310-312855-11
Matrix: Water

Date Collected: 08/06/25 14:38
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 14:51
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:06
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:29
Total/NA	Analysis	I-3765-85		1	463054	E6KR	EET CF	08/08/25 09:51
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 14:38

Client Sample ID: Field Blank

Lab Sample ID: 310-312855-12
Matrix: Water

Date Collected: 08/06/25 12:55
Date Received: 08/07/25 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	464334	ZRI4	EET CF	08/20/25 13:46
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:09
Total/NA	Prep	3005A			464280	WK2X	EET CF	08/21/25 09:00
Total/NA	Analysis	6020B		1	464444	NFT2	EET CF	08/21/25 17:43
Total/NA	Analysis	I-3765-85		1	463054	E6KR	EET CF	08/08/25 09:51
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49

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

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

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: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	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.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

eurofins | Environment Testing America

310-312855 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 8-7-25 TIME 1530 | 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 # 1 of 3

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: AA | 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): 1.4 | Corrected Temp (°C): 1.4

• **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

Document: CED-P-SAM-FRM45521
Revision: 26
Date: 27 Jan 2022

Eurofins Cedar Falls

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

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

Receipt Information

Date/Time Received: DATE 8-7-25 | TIME 1530 | 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 # 2 of 3

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: AA | 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): 0.6 | Corrected Temp (°C): 0.6

• **Sample Container Temperature**

Container(s) used	CONTAINER 1	CONTAINER 2
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: SCS

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

Receipt Information

Date/Time Received: DATE 8-7-25 | TIME 1530 | 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 # 3 of 3

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: AA | 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): 4.0 | Corrected Temp (°C): 4.0

• **Sample Container Temperature**

Container(s) used:	CONTAINER 1	CONTAINER 2
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

Document CED-P-SAM-FRM45521
Revision 26
Date 27 Jan 2022

Eurofins Cedar Falls

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

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

Chain of Custody Record

eurofins

Client Information	Sampler: Michael Morgan	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No
Client Contact: Meghan Blodgett	Phone: 515 631-0778	E-Mail: Sandie.Fredrick@et.eurofinsus.com	State of Origin: IA	Page: 1 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Dr	Due Date Requested			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-345-9221	PO #:			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Midland LF	Project #: 25225073 00			
Site: Ottumwa Midland LF	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)	6020B - Metals (15)	2540C_Calcd, 8260A_ORGFM_28D, _1765_85	Total Number of containers	Special Instructions/Note
			Preservation Code:		X	X	D	N	X	
MW-1R	8/6/25	8 25	G	Water	N		X	X		Metals list: As, Ba, Be, B, Ca, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Se, Z
MW-12	8/5/25	15 02	G	Water	N		X	X		
MW-13	8/5/25	13 02	G	Water	N		X	X		
MW-14	8/5/25	8 03	G	Water	N		X	X		
MW-15R	8/5/25	12 29	G	Water	N		X	X		
MW-16R	8/6/25	12 38	G	Water	N		X	X		
MW-17			G	Water	N		X	X		
MW-100R	8/5/25	10 15	G	Water	N		X	X		
MW-101R	8/6/25	10 43	G	Water	N		X	X		
MW-102P	8/6/25	8 43	G	Water	N		X	X		
MW-108	8/5/25	15 23	G	Water	N		X	X		

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
Michael Morgan	8/7/25 10 00	SCS Engineers		8.7.25 10	
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: 01/12/2023

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

Chain of Custody Record

eurofins

Client Information	Sampler: Michael Morgan	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No.
Client Contact: Meghan Blodgett	Phone: 515-631-0778	E-Mail: Sandie.Fednck@et.eurofinsus.com	State of Origin: IA	Page: 2 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Dr	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-345-9221	PO #:			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Midland LF	Project #: 25225073 00			
Site: Ottumwa Midland LF	SSOW#:			

Analysis Requested

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)	6020B - Metals (15)	2540C_Calcd, 9056A_ORGFM_28D_1_3715_83	Total Number of containers	Special Instructions/Note.
			Preservation Code:		X	X	D	N	X	
MW-125	8/6/25	4 38	G	Water	N		X	X		Metals list: As, Ba, Be, B, Ca, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Se, Z
Field Blank	8/6/25	12 55	G	Water	N		X	X		

Preservation Codes

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

Other:

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
Michael Morgan	8/7/25 10 00	SCS Engineers		8.7.25 1530	
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: 01/12/2023

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-312855-1

Login Number: 312855
List Number: 1
Creator: Hirsch, Preston

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	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Groundwater Monitoring Results - Field Parameters
Ottumwa Midland Landfill / SCS Engineers Project #25225073.00
August 2025

Eurofins Report Number	Sample	Date	Temperature (Deg. C)	pH (Std. Units)	Specific Conductivity (µmhos/cm)	GW Elevation (feet)
310-312855-1	MW-1R	8/6/2025	18.8	6.93	792	813.14
	MW-12	8/5/2025	16.0	7.80	2551	722.07
	MW-13	8/5/2025	17.6	7.00	3285	722.03
	MW-14	8/5/2025	16.5	7.03	2917	722.23
	MW-15R	8/5/2025	22.2	6.18	2221	760.47
	MW-16R	8/6/2025	15.0	6.83	3093	721.88
	MW-100R	8/5/2025	22.5	7.14	963	808.21
	MW-101R	8/6/2025	14.4	6.82	1432	782.40
	MW-102P	8/6/2025	18.9	6.38	2857	722.41
	MW-108	8/5/2025	16.8	6.48	599	741.11
	MW-125	8/6/2025	16.4	6.65	2929	722.34
310-312855-2	SW-3	8/6/2025	27.4	7.80	--	--
	TCB-1/2	8/6/2025	27.8	8.70	809	--
	GU-1 Temp	8/6/2025	21.5	6.76	1422	--
	GU-EX	8/6/2025	23.1	7.34	1238	--
	Leachate Basin	8/6/2025	29.9	8.23	4497	--

Abbreviations:
amsl = above mean sea level
µmhos/cm = microSiemens per centimeter
NM = Not Measured

Created by: AJR Date: 8/15/2019
Last revision by: BLJ Date: 8/14/2025
Checked by: RM Date: 8/14/2025

C:\Users\FQT6\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\KFZAQBZG\[2508_OML_Field_Data.xlsx]GW Field Data

Table 1, Page 1 of 1

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 8/21/2025 11:56:06 AM

JOB DESCRIPTION

Ottumwa Midland LF 25225073.00

JOB NUMBER

310-312855-2

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

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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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job Narrative
310-312855-2

The analytical test results presented in this report meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page, unless otherwise noted. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable. Regulated compliance samples (e.g. SDWA, NPDES) must comply with associated agency requirements/permits.

- Matrix-specific batch QC (e.g., MS, MSD, SD) may not be reported when insufficient sample volume is available or when site-specific QC samples are not submitted. In such cases, a Laboratory Control Sample Duplicate (LCSD) may be analyzed to provide precision data for the batch.
- For samples analyzed using surrogate and/or isotope dilution analytes, any recoveries falling outside of established acceptance criteria are re-prepared and/or re-analyzed to confirm results, unless the deviation is due to sample dilution or otherwise explained in the case narrative.

Receipt
The samples were received on 8/7/2025 3:30 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.6°C, 1.4°C and 4.0°C.

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

Metals
Method 6020B: The method blank for preparation batch 310-463426 and analytical batch 310-463704 contained barium above the method detection limit (MDL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

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.

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

Sample Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Sample Origin
310-312855-13	GU-1	Water	08/06/25 14:15	08/07/25 15:30	Iowa
310-312855-14	GU-EX	Water	08/06/25 07:30	08/07/25 15:30	Iowa
310-312855-15	TCB-1/2	Water	08/06/25 13:45	08/07/25 15:30	Iowa
310-312855-16	SW-03	Water	08/06/25 12:04	08/07/25 15:30	Iowa
310-312855-17	Leachate Basin	Water	08/06/25 15:50	08/07/25 15:30	Iowa

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: GU-1 — Lab Sample ID: 310-312855-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.52	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	410		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	34	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	300		100	82	ug/L	1		6020B	Total/NA
Calcium	200		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	6.0		0.50	0.17	ug/L	1		6020B	Total/NA
Lithium	46		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	2.1		2.0	1.3	ug/L	1		6020B	Total/NA
Zinc	31		20	13	ug/L	1		6020B	Total/NA
Magnesium	61000		500	150	ug/L	1		6020B	Total/NA
Manganese	1700		10	3.6	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1100		250	180	mg/L	1		SM 2540C	Total/NA
Field pH	6.76				SU	1		Field Sampling	Total/NA
Field Conductivity	1422				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	21.5				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: GU-EX — Lab Sample ID: 310-312855-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.45	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	530		50	21	mg/L	50		9056A	Total/NA
Arsenic	1.1	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	46	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	820		100	82	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.64		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	240		100	50	ug/L	1		6020B	Total/NA
Lithium	17		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	35		2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	4.4	J	5.0	1.4	ug/L	1		6020B	Total/NA
Magnesium	38000		500	150	ug/L	1		6020B	Total/NA
Manganese	110		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	13		1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	880		250	180	mg/L	1		SM 2540C	Total/NA
Field pH	7.34				SU	1		Field Sampling	Total/NA
Field Conductivity	1238				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	23.1				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: TCB-1/2 — Lab Sample ID: 310-312855-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	370		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.90	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	65	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	430		100	82	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.85		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	340		100	50	ug/L	1		6020B	Total/NA
Molybdenum	4.4		2.0	1.3	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: TCB-1/2 (Continued) — Lab Sample ID: 310-312855-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	15000		500	150	ug/L	1		6020B	Total/NA
Manganese	8.5	J	10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	1.4	J	1.9	1.3	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	590		50	36	mg/L	1		SM 2540C	Total/NA
Field pH	8.70				SU	1		Field Sampling	Total/NA
Field Conductivity	809				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	27.8				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: SW-03 — Lab Sample ID: 310-312855-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	12		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.48	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	340		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	3.6		2.0	0.53	ug/L	1		6020B	Total/NA
Barium	72	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	700		100	82	ug/L	1		6020B	Total/NA
Calcium	68		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.30	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	170		100	50	ug/L	1		6020B	Total/NA
Lithium	8.1	J	10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	11		2.0	1.3	ug/L	1		6020B	Total/NA
Magnesium	30000		500	150	ug/L	1		6020B	Total/NA
Manganese	28		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	38		5.0	3.5	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	580		50	36	mg/L	1		SM 2540C	Total/NA
Field pH	7.80				SU	1		Field Sampling	Total/NA
Field Temperature	27.4				Degrees C	1		Field Sampling	Total/NA

Client Sample ID: Leachate Basin — Lab Sample ID: 310-312855-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	450		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	2000		50	21	mg/L	50		9056A	Total/NA
Arsenic	13		2.0	0.53	ug/L	1		6020B	Total/NA
Barium	61	B	2.0	0.66	ug/L	1		6020B	Total/NA
Boron	2000		100	82	ug/L	1		6020B	Total/NA
Calcium	200		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.32	J	0.50	0.17	ug/L	1		6020B	Total/NA
Lithium	24		10	2.9	ug/L	1		6020B	Total/NA
Molybdenum	560		2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	46		5.0	1.4	ug/L	1		6020B	Total/NA
Zinc	25		20	13	ug/L	1		6020B	Total/NA
Magnesium	26000		500	150	ug/L	1		6020B	Total/NA
Manganese	25		10	3.6	ug/L	1		6020B	Total/NA
Total Suspended Solids	160		60	42	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	3200		250	180	mg/L	1		SM 2540C	Total/NA
Field pH	8.23				SU	1		Field Sampling	Total/NA
Field Conductivity	4497				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	29.9				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: GU-1

Date Collected: 08/06/25 14:15
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-13

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**20**		5.0	2.3	mg/L			08/19/25 15:14	5
Fluoride	**0.52**	**J**	1.0	0.38	mg/L			08/19/25 15:14	5
Sulfate	**410**		5.0	2.1	mg/L			08/19/25 15:14	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:11	1
Barium	**34**	**B**	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:34	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:11	1
Boron	**300**		100	82	ug/L		08/13/25 09:30	08/13/25 18:11	1
Calcium	**200**		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:11	1
Cobalt	**6.0**		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:11	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 18:11	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:11	1
Lithium	**46**		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:11	1
Molybdenum	**2.1**		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:11	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:11	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:11	1
Zinc	**31**		20	13	ug/L		08/13/25 09:30	08/13/25 18:11	1
Magnesium	**61000**		500	150	ug/L		08/13/25 09:30	08/13/25 18:11	1
Manganese	**1700**		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.3		1.9	1.3	mg/L			08/08/25 09:51	1
Total Dissolved Solids (SM 2540C)	**1100**		250	180	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	**6.76**				SU			08/06/25 14:15	1
Field Conductivity	**1422**				umhos/cm			08/06/25 14:15	1
Field Temperature	**21.5**				Degrees C			08/06/25 14:15	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: GU-EX

Date Collected: 08/06/25 07:30
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-14

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22		5.0	2.3	mg/L			08/19/25 15:26	5
Fluoride	0.45	J	1.0	0.38	mg/L			08/19/25 15:26	5
Sulfate	530		50	21	mg/L			08/20/25 13:57	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.1	J	2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:14	1
Barium	46	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:36	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:14	1
Boron	820		100	82	ug/L		08/13/25 09:30	08/13/25 18:14	1
Calcium	110		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:14	1
Cobalt	0.64		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:14	1
Iron	240		100	50	ug/L		08/13/25 09:30	08/13/25 18:14	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:14	1
Lithium	17		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:14	1
Molybdenum	35		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:14	1
Selenium	4.4	J	5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:14	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:14	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 18:14	1
Magnesium	38000		500	150	ug/L		08/13/25 09:30	08/13/25 18:14	1
Manganese	110		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	13		1.9	1.3	mg/L			08/08/25 09:51	1
Total Dissolved Solids (SM 2540C)	880		250	180	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	7.34				SU			08/06/25 07:30	1
Field Conductivity	1238				umhos/cm			08/06/25 07:30	1
Field Temperature	23.1				Degrees C			08/06/25 07:30	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: TCB-1/2

Date Collected: 08/06/25 13:45
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-15

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**14**		5.0	2.3	mg/L			08/19/25 15:37	5
Fluoride	<0.38		1.0	0.38	mg/L			08/19/25 15:37	5
Sulfate	**370**		5.0	2.1	mg/L			08/19/25 15:37	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.90**	**J**	2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:16	1
Barium	**65**	**B**	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:44	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:16	1
Boron	**430**		100	82	ug/L		08/13/25 09:30	08/13/25 18:16	1
Calcium	**110**		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:16	1
Cobalt	**0.85**		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:16	1
Iron	**340**		100	50	ug/L		08/13/25 09:30	08/13/25 18:16	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:16	1
Lithium	<2.9		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:16	1
Molybdenum	**4.4**		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:16	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:16	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:16	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 18:16	1
Magnesium	**15000**		500	150	ug/L		08/13/25 09:30	08/13/25 18:16	1
Manganese	**8.5**	**J**	10	3.6	ug/L		08/13/25 09:30	08/13/25 18:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.4**	**J**	1.9	1.3	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	**590**		50	36	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	**8.70**				SU			08/06/25 13:45	1
Field Conductivity	**809**				umhos/cm			08/06/25 13:45	1
Field Temperature	**27.8**				Degrees C			08/06/25 13:45	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: SW-03

Date Collected: 08/06/25 12:04
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-16

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12		5.0	2.3	mg/L			08/19/25 15:49	5
Fluoride	0.48	J	1.0	0.38	mg/L			08/19/25 15:49	5
Sulfate	340		5.0	2.1	mg/L			08/19/25 15:49	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.6		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:19	1
Barium	72	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:47	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:19	1
Boron	700		100	82	ug/L		08/13/25 09:30	08/13/25 18:19	1
Calcium	68		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:19	1
Cobalt	0.30	J	0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:19	1
Iron	170		100	50	ug/L		08/13/25 09:30	08/13/25 18:19	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:19	1
Lithium	8.1	J	10	2.9	ug/L		08/13/25 09:30	08/13/25 18:19	1
Molybdenum	11		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:19	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:19	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:19	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 18:19	1
Magnesium	30000		500	150	ug/L		08/13/25 09:30	08/13/25 18:19	1
Manganese	28		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	38		5.0	3.5	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	580		50	36	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	7.80				SU			08/06/25 12:04	1
Field Temperature	27.4				Degrees C			08/06/25 12:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: Leachate Basin

Lab Sample ID: 310-312855-17

Date Collected: 08/06/25 15:50
Date Received: 08/07/25 15:30

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	450		5.0	2.3	mg/L			08/19/25 16:00	5
Fluoride	<0.38		1.0	0.38	mg/L			08/19/25 16:00	5
Sulfate	2000		50	21	mg/L			08/20/25 14:32	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	13		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 18:22	1
Barium	61	B	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:49	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 18:22	1
Boron	2000		100	82	ug/L		08/13/25 09:30	08/13/25 18:22	1
Calcium	200		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 18:22	1
Cobalt	0.32	J	0.50	0.17	ug/L		08/13/25 09:30	08/13/25 18:22	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 18:22	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 18:22	1
Lithium	24		10	2.9	ug/L		08/13/25 09:30	08/13/25 18:22	1
Molybdenum	560		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 18:22	1
Selenium	46		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 18:22	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 18:22	1
Zinc	25		20	13	ug/L		08/13/25 09:30	08/13/25 18:22	1
Magnesium	26000		500	150	ug/L		08/13/25 09:30	08/13/25 18:22	1
Manganese	25		10	3.6	ug/L		08/13/25 09:30	08/13/25 18:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	160		60	42	mg/L			08/08/25 11:04	1
Total Dissolved Solids (SM 2540C)	3200		250	180	mg/L			08/11/25 11:49	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	8.23				SU			08/06/25 15:50	1
Field Conductivity	4497				umhos/cm			08/06/25 15:50	1
Field Temperature	29.9				Degrees C			08/06/25 15:50	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-312855-2
Project/Site: Ottumwa Midland LF 25225073.00

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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

QC Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-464334/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 464334

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			08/19/25 10:59	1
Fluoride	<0.075		0.20	0.075	mg/L			08/19/25 10:59	1
Sulfate	<0.42		1.0	0.42	mg/L			08/19/25 10:59	1

Lab Sample ID: LCS 310-464334/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 464334

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.69		mg/L		97	90 - 110
Sulfate	10.0	10.0		mg/L		100	90 - 110

Lab Sample ID: LCS 310-464334/45 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 464334

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	1.94		mg/L		97	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-463426/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463426**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		08/13/25 09:30	08/13/25 17:12	1
Beryllium	<0.33		1.0	0.33	ug/L		08/13/25 09:30	08/13/25 17:12	1
Boron	<82		100	82	ug/L		08/13/25 09:30	08/13/25 17:12	1
Calcium	<0.19		0.50	0.19	mg/L		08/13/25 09:30	08/13/25 17:12	1
Cobalt	<0.17		0.50	0.17	ug/L		08/13/25 09:30	08/13/25 17:12	1
Iron	<50		100	50	ug/L		08/13/25 09:30	08/13/25 17:12	1
Lead	<0.33		0.50	0.33	ug/L		08/13/25 09:30	08/13/25 17:12	1
Lithium	<2.9		10	2.9	ug/L		08/13/25 09:30	08/13/25 17:12	1
Molybdenum	<1.3		2.0	1.3	ug/L		08/13/25 09:30	08/13/25 17:12	1
Selenium	<1.4		5.0	1.4	ug/L		08/13/25 09:30	08/13/25 17:12	1
Copper	<3.2		5.0	3.2	ug/L		08/13/25 09:30	08/13/25 17:12	1
Zinc	<13		20	13	ug/L		08/13/25 09:30	08/13/25 17:12	1
Magnesium	<150		500	150	ug/L		08/13/25 09:30	08/13/25 17:12	1
Manganese	<3.6		10	3.6	ug/L		08/13/25 09:30	08/13/25 17:12	1

Lab Sample ID: MB 310-463426/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463704 — **Prep Batch: 463426**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	1.37	J	2.0	0.66	ug/L		08/13/25 09:30	08/14/25 14:54	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-463426/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463607 — **Prep Batch: 463426**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	200		ug/L		100	80 - 120
Beryllium	100	97.5		ug/L		98	80 - 120
Boron	200	198		ug/L		99	80 - 120
Calcium	2.00	1.87		mg/L		94	80 - 120
Cobalt	100	100		ug/L		100	80 - 120
Iron	200	218		ug/L		109	80 - 120
Lead	200	194		ug/L		97	80 - 120
Lithium	200	194		ug/L		97	80 - 120
Molybdenum	200	198		ug/L		99	80 - 120
Selenium	400	373		ug/L		93	80 - 120
Copper	200	206		ug/L		103	80 - 120
Zinc	200	190		ug/L		95	80 - 120
Magnesium	2000	2110		ug/L		105	80 - 120
Manganese	100	99.3		ug/L		99	80 - 120

Lab Sample ID: LCS 310-463426/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463704 — **Prep Batch: 463426**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	100	97.4		ug/L		97	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-463054/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463054

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			08/08/25 09:51	1

Lab Sample ID: LCS 310-463054/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463054

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	95.0		mg/L		95	82 - 117

Lab Sample ID: MB 310-463066/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463066

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<3.5		5.0	3.5	mg/L			08/08/25 11:04	1

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: LCS 310-463066/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463066

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			100	100		mg/L		100	82 - 117		

Lab Sample ID: 310-312855-17 DU — **Client Sample ID: Leachate Basin**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463066

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	160			164		mg/L				5	35

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

Lab Sample ID: MB 310-463243/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463243

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<36		50	36	mg/L			08/11/25 11:49	1

Lab Sample ID: LCS 310-463243/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463243

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1030		mg/L		103	89 - 110		

Lab Sample ID: 310-312855-15 DU — **Client Sample ID: TCB-1/2**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 463243

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	590			572		mg/L				3	13

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

HPLC/IC

Analysis Batch: 464334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	9056A	
310-312855-14	GU-EX	Total/NA	Water	9056A	
310-312855-14	GU-EX	Total/NA	Water	9056A	
310-312855-15	TCB-1/2	Total/NA	Water	9056A	
310-312855-16	SW-03	Total/NA	Water	9056A	
310-312855-17	Leachate Basin	Total/NA	Water	9056A	
310-312855-17	Leachate Basin	Total/NA	Water	9056A	
MB 310-464334/3	Method Blank	Total/NA	Water	9056A	
LCS 310-464334/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-464334/45	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 463426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	3005A	
310-312855-14	GU-EX	Total/NA	Water	3005A	
310-312855-15	TCB-1/2	Total/NA	Water	3005A	
310-312855-16	SW-03	Total/NA	Water	3005A	
310-312855-17	Leachate Basin	Total/NA	Water	3005A	
MB 310-463426/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 463607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	6020B	463426
310-312855-14	GU-EX	Total/NA	Water	6020B	463426
310-312855-15	TCB-1/2	Total/NA	Water	6020B	463426
310-312855-16	SW-03	Total/NA	Water	6020B	463426
310-312855-17	Leachate Basin	Total/NA	Water	6020B	463426
MB 310-463426/1-A	Method Blank	Total/NA	Water	6020B	463426
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	6020B	463426

Analysis Batch: 463704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	6020B	463426
310-312855-14	GU-EX	Total/NA	Water	6020B	463426
310-312855-15	TCB-1/2	Total/NA	Water	6020B	463426
310-312855-16	SW-03	Total/NA	Water	6020B	463426
310-312855-17	Leachate Basin	Total/NA	Water	6020B	463426
MB 310-463426/1-A	Method Blank	Total/NA	Water	6020B	463426
LCS 310-463426/2-A	Lab Control Sample	Total/NA	Water	6020B	463426

General Chemistry

Analysis Batch: 463054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	I-3765-85	
310-312855-14	GU-EX	Total/NA	Water	I-3765-85	
MB 310-463054/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-463054/2	Lab Control Sample	Total/NA	Water	I-3765-85	

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

General Chemistry

Analysis Batch: 463066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-15	TCB-1/2	Total/NA	Water	I-3765-85	
310-312855-16	SW-03	Total/NA	Water	I-3765-85	
310-312855-17	Leachate Basin	Total/NA	Water	I-3765-85	
MB 310-463066/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-463066/2	Lab Control Sample	Total/NA	Water	I-3765-85	
310-312855-17 DU	Leachate Basin	Total/NA	Water	I-3765-85	

Analysis Batch: 463243

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	SM 2540C	
310-312855-14	GU-EX	Total/NA	Water	SM 2540C	
310-312855-15	TCB-1/2	Total/NA	Water	SM 2540C	
310-312855-16	SW-03	Total/NA	Water	SM 2540C	
310-312855-17	Leachate Basin	Total/NA	Water	SM 2540C	
MB 310-463243/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-463243/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-312855-15 DU	TCB-1/2	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 463689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-312855-13	GU-1	Total/NA	Water	Field Sampling	
310-312855-14	GU-EX	Total/NA	Water	Field Sampling	
310-312855-15	TCB-1/2	Total/NA	Water	Field Sampling	
310-312855-16	SW-03	Total/NA	Water	Field Sampling	
310-312855-17	Leachate Basin	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: GU-1
Date Collected: 08/06/25 14:15
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 15:14
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:11
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:34
Total/NA	Analysis	I-3765-85		1	463054	E6KR	EET CF	08/08/25 09:51
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 14:15

Client Sample ID: GU-EX
Date Collected: 08/06/25 07:30
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-14
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 15:26
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 13:57
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:14
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:36
Total/NA	Analysis	I-3765-85		1	463054	E6KR	EET CF	08/08/25 09:51
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 07:30

Client Sample ID: TCB-1/2
Date Collected: 08/06/25 13:45
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 15:37
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:16
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:44
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 13:45

Client Sample ID: SW-03
Date Collected: 08/06/25 12:04
Date Received: 08/07/25 15:30

Lab Sample ID: 310-312855-16
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 15:49

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Client Sample ID: SW-03

Lab Sample ID: 310-312855-16
Date Collected: 08/06/25 12:04
Date Received: 08/07/25 15:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:19
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:47
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 12:04

Client Sample ID: Leachate Basin

Lab Sample ID: 310-312855-17
Date Collected: 08/06/25 15:50
Date Received: 08/07/25 15:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	464334	ZRI4	EET CF	08/19/25 16:00
Total/NA	Analysis	9056A		50	464334	ZRI4	EET CF	08/20/25 14:32
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463607	NFT2	EET CF	08/13/25 18:22
Total/NA	Prep	3005A			463426	WK2X	EET CF	08/13/25 09:30
Total/NA	Analysis	6020B		1	463704	NFT2	EET CF	08/14/25 14:49
Total/NA	Analysis	I-3765-85		1	463066	E6KR	EET CF	08/08/25 11:04
Total/NA	Analysis	SM 2540C		1	463243	ENB7	EET CF	08/11/25 11:49
Total/NA	Analysis	Field Sampling		1	463689	FQT6	EET CF	08/06/25 15:50

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

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

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: SCS Engineers
Project/Site: Ottumwa Midland LF 25225073.00

Job ID: 310-312855-2

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	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.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

eurofins | Environment Testing America

310-312855 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison | STATE WI | Project

Receipt Information

Date/Time Received: DATE 8-7-25 | TIME 1530 | 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 # 1 of 3

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: AA | 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): 1.4 | Corrected Temp (°C): 1.4

• **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

Document CED-P-SAM-FRM45521
Revision: 26
Date 27 Jan 2022

Eurofins Cedar Falls

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 8-7-25 TIME 1530 | 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 # 2 of 3

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: AA | 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): 0.6 | Corrected Temp (°C): 0.6

• **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

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

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

Receipt Information

Date/Time Received: DATE 8-7-25 | TIME 1530 | 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 # 3 of 3

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: AH | 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): 4.0 | Corrected Temp (°C): 4.0

• **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

Client Information	Sampler: Michael Morgan	Lab PM: Sandie Frednck	Carrier Tracking No(s):	COC No.
Client Contact: Meghan Blodgett	Phone: 515-631-0778	E-Mail: Sandie.Frednck@et.eurofinsus.com	State of Origin: IA	Page: 1 of 1
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Dr	Due Date Requested			
City: Madison	TAT Requested (days)			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-345-9221	PO #:			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Midland LF	Project #: 25225073 00			
Site: Ottumwa Midland LF	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)	6020B - Metals (15)	2540C_Calcd, 9056A_ORGFM_28D, I_3765_85	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N		
GU-1	8/6/25	14 15	G	Water	N		X	X		Metals list: As, Ba, Be, B, Ca, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Se, Z
GU-2			G	Water	N		X	X		
GU-EX	8/6/25	7 30	G	Water	N		X	X		
TCB-1/2	8/6/25	13 45	G	Water	N		X	X		
SW-01R			G	Water	N		X	X		
SW-02R			G	Water	N		X	X		
SW-03	8/6/25	12 04	G	Water	N		X	X		
SW-04			G	Water	N		X	X		
SW-05			G	Water	N		X	X		
LP-1			G	Water	N		X	X		
Leachate Basin	8/6/25	15 50	G	Water	N		X	X		

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
Michael Morgan	8/7/25 10 00	SCS Engineers		8-7-25 1500	
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: 01/12/2023

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-312855-2

Login Number: 312855
List Number: 1
Creator: Hirsch, Preston

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	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Groundwater Monitoring Results - Field Parameters
Ottumwa Midland Landfill / SCS Engineers Project #25225073.00
August 2025

Eurofins Report Number	Sample	Date	Temperature (Deg. C)	pH (Std. Units)	Specific Conductivity (µmhos/cm)	GW Elevation (feet)
310-312855-1	MW-1R	8/6/2025	18.8	6.93	792	813.14
	MW-12	8/5/2025	16.0	7.80	2551	722.07
	MW-13	8/5/2025	17.6	7.00	3285	722.03
	MW-14	8/5/2025	16.5	7.03	2917	722.23
	MW-15R	8/5/2025	22.2	6.18	2221	760.47
	MW-16R	8/6/2025	15.0	6.83	3093	721.88
	MW-100R	8/5/2025	22.5	7.14	963	808.21
	MW-101R	8/6/2025	14.4	6.82	1432	782.40
	MW-102P	8/6/2025	18.9	6.38	2857	722.41
	MW-108	8/5/2025	16.8	6.48	599	741.11
	MW-125	8/6/2025	16.4	6.65	2929	722.34
310-312855-2	SW-3	8/6/2025	27.4	7.80	--	--
	TCB-1/2	8/6/2025	27.8	8.70	809	--
	GU-1 Temp	8/6/2025	21.5	6.76	1422	--
	GU-EX	8/6/2025	23.1	7.34	1238	--
	Leachate Basin	8/6/2025	29.9	8.23	4497	--

Abbreviations:
amsl = above mean sea level
µmhos/cm = microSiemens per centimeter
NM = Not Measured

Created by: AJR Date: 8/15/2019
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C:\Users\FQT6\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\KFZAQBZG\[2508_OML_Field_Data.xlsx]GW Field Data

Table 1, Page 1 of 1

Appendix C

Summary of Historical Groundwater Chemistry

IPL Ottumwa Midland Landfill
Historic Monitoring Results

ARSENIC
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
ARSENIC, DISSOLVED	1995-Aug	<5			<5	5.9										
ARSENIC, DISSOLVED	1995-Oct	<5		<5	<5	11.7			<5		<5	<5				
ARSENIC, DISSOLVED	1996-Apr	<1		<1	1	11			<1		<1	<1				
ARSENIC, DISSOLVED	1996-Jan	<1		<1	<1	9			<1			<1				
ARSENIC, DISSOLVED	1996-Jul	<5		<5	<5	15			<5		<5	<5				
ARSENIC, DISSOLVED	1996-Oct					8										
ARSENIC, DISSOLVED	1997-Apr					8.6										
ARSENIC, DISSOLVED	1997-Oct					5.3					<1					
ARSENIC, DISSOLVED	1998-Apr					2.6										
ARSENIC, DISSOLVED	1998-Oct					3.7	<1									
ARSENIC, DISSOLVED	1999-Sep				<1	2.3	3.4									
ARSENIC, DISSOLVED	2000-Sep	<1		<1	<1	2.7	<1		<1		1.3	<1				
ARSENIC, DISSOLVED	2001-Sep	<1		<1 NS	<1	<1	<1		<1		<1	<1				
ARSENIC, DISSOLVED	2002-Sep	<1		<1	<1	<1	<1		<1		<1	<1				
ARSENIC, DISSOLVED	2003-Sep	<1		<1	<1	1.7	<1		<2 R_2N_2S		<1	<1				
ARSENIC, DISSOLVED	2004-Oct															
ARSENIC, DISSOLVED	2004-Sep	<1		<1	<2 R	<1	<1		<2 R			<2 R				
ARSENIC, DISSOLVED	2005-Sep	<1 WT		<1 WT	<1 WT	1.2 WT	1.1 WT		<1 WT		<1 WT	<1 WT				
ARSENIC, DISSOLVED	2006-Sep	<1		<1	<2 RL1	<1	<1		<1		<1	<1				
ARSENIC, DISSOLVED	2007-Sep	<1		<1	<1	<1	<1		<1			<1				
ARSENIC, DISSOLVED	2008-Sep	<1		<1	<1	<1 pH>2	<1		<1		<1	<1				
ARSENIC, DISSOLVED	2009-Sep	<1		<1	<2	<1	<2		<2		<1	<2				
ARSENIC, DISSOLVED	2010-Aug	<2 RL1														
ARSENIC, DISSOLVED	2010-Sep			<1	<2 RL1	9.36	<4 RL1		<2		<2 RL1	<1				
ARSENIC, DISSOLVED	2011-Sep	<6 RL1		<1	<2 RL1	2.86	<12 RL1		<2 RL1			<2 RL1				
ARSENIC, DISSOLVED	2012-Sep	<3 RL1		<1	<2 RL1	<1	<2 RL1		<2 RL1			<1				
ARSENIC	2013-Sep															
ARSENIC, DISSOLVED	2013-Sep	<1		<1	<1	5.9	<1		<1		<1	<1				
ARSENIC	2014-Sep															
ARSENIC, DISSOLVED	2014-Sep	<0.05		0.071 J	<0.05	2.3	0.48		<0.05		<0.05					
ARSENIC	2015-Dec															
ARSENIC, DISSOLVED	2015-Dec												<4.5	<4.5	<4.5	<4.5
ARSENIC	2015-Sep															
ARSENIC, DISSOLVED	2015-Sep	<4.5		<4.5	<4.5	<4.5		<4.5		<4.5			<4.5	<4.5	6.9	<4.5
ARSENIC	2016-Jun															
ARSENIC, DISSOLVED	2016-Jun												0.21	0.37	1.2	0.93
ARSENIC	2016-Mar															
ARSENIC, DISSOLVED	2016-Mar												<3.9	<3.9	<3.9	<3.9
ARSENIC	2016-Sep															
ARSENIC, DISSOLVED	2016-Sep	0.12		0.46	<0.21 D3	0.4		0.43		0.4	<0.1		0.15	<0.1	0.86	0.5
ARSENIC	2017-Aug	0.2		0.19	0.12	6.9		0.55		0.21	0.052		0.18	0.25	0.61	1.1
ARSENIC	2018-Aug			0.27	0.16	13.7		1		0.35	0.31		0.27	0.44	0.66	1.7
ARSENIC	2019-Apr	<0.75														
ARSENIC	2019-Aug		<0.75	<0.75	<0.75	21		<0.75		<0.75	<0.75		<0.75	<0.75	<0.75	3

GW Standard:
MCL = 10

IPL Ottumwa Midland Landfill
Historic Monitoring Results

ARSENIC
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
ARSENIC, DISSOLVED	1995-Aug										<5						
ARSENIC, DISSOLVED	1995-Oct										<5						
ARSENIC, DISSOLVED	1996-Apr						<1		<1		<1						
ARSENIC, DISSOLVED	1996-Jan																
ARSENIC, DISSOLVED	1996-Jul						<5		<5		<5		<5				
ARSENIC, DISSOLVED	1996-Oct																
ARSENIC, DISSOLVED	1997-Apr																
ARSENIC, DISSOLVED	1997-Oct																
ARSENIC, DISSOLVED	1998-Apr						<1		<1				<1				
ARSENIC, DISSOLVED	1998-Oct						1.8		1.7				1				
ARSENIC, DISSOLVED	1999-Sep										1.8		<1				
ARSENIC, DISSOLVED	2000-Sep										<1		<1				
ARSENIC, DISSOLVED	2001-Sep						<1				<1		<1				
ARSENIC, DISSOLVED	2002-Sep										<1		<1				
ARSENIC, DISSOLVED	2003-Sep										<1		<1				
ARSENIC, DISSOLVED	2004-Oct																
ARSENIC, DISSOLVED	2004-Sep						2.2						<1				
ARSENIC, DISSOLVED	2005-Sep										< WT		<1				
ARSENIC, DISSOLVED	2006-Sep										1.45		<1				
ARSENIC, DISSOLVED	2007-Sep						1.72		<1		1.53		1.14				
ARSENIC, DISSOLVED	2008-Sep						1.5		1.25		2.94	2	<1				
ARSENIC, DISSOLVED	2009-Sep						1.14				<1		<1				
ARSENIC, DISSOLVED	2010-Aug																
ARSENIC, DISSOLVED	2010-Sep						1.74		<1		1.35	<1	1.63				
ARSENIC, DISSOLVED	2011-Sep												5.83				
ARSENIC, DISSOLVED	2012-Sep				<2						<1		7.19				
ARSENIC	2013-Sep													21			
ARSENIC, DISSOLVED	2013-Sep										<1	3.3	1.8				<1
ARSENIC	2014-Sep					0.76								2.8	5.8		<0.18
ARSENIC, DISSOLVED	2014-Sep						2	<15	1.3	<15	0.3 J	1.9	0.31 J				
ARSENIC	2015-Dec	<4.5														<4.5	<4.5
ARSENIC, DISSOLVED	2015-Dec	<4.5															
ARSENIC	2015-Sep	<4.5		<4.5							<4.5	4.7	<4.5	<4.5		<4.5	<4.5
ARSENIC, DISSOLVED	2015-Sep	<4.5															
ARSENIC	2016-Jun	0.12														1.6	<0.1
ARSENIC, DISSOLVED	2016-Jun	0.22															
ARSENIC	2016-Mar	<3.9														<3.9	<3.9
ARSENIC, DISSOLVED	2016-Mar	<3.9															
ARSENIC	2016-Sep	<0.1		0.34							1.6		2.8	2.1		2	<0.1
ARSENIC, DISSOLVED	2016-Sep																
ARSENIC	2017-Aug	0.079		0.68							1.7		4.1	2.8		1.4	<0.052
ARSENIC	2018-Aug	0.27		1							<4.9		4.7	3.1		1.8	<0.15
ARSENIC	2019-Apr																<0.75
ARSENIC	2019-Aug	<0.75	<0.75	1.9 J							1.9 J	7.3	1.5 J	4.6		3.5	<0.75

GW Standard:
MCL = 10

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BARIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
BARIUM, DISSOLVED	1995-Aug	184			58	152										
BARIUM, DISSOLVED	1995-Oct	183		37	43	105			104		53	119				
BARIUM, DISSOLVED	1996-Apr	142		40	33	59			77		34	76				
BARIUM, DISSOLVED	1996-Jan	192		60	62	114			74			93				
BARIUM, DISSOLVED	1996-Jul	156		29	32	74			63		120	55				
BARIUM, DISSOLVED	1997-Oct										60					
BARIUM, DISSOLVED	1998-Apr										27					
BARIUM, DISSOLVED	1998-Oct						28									
BARIUM, DISSOLVED	1999-Sep	92		43	21	53	25		42		53	36				
BARIUM, DISSOLVED	2000-Sep	70		33	17	49	24		33		74	34				
BARIUM, DISSOLVED	2001-Sep	59		45	21	42	13		34		64	38				
BARIUM, DISSOLVED	2002-Sep	71		44	23	46	28		33		38	32				
BARIUM, DISSOLVED	2003-Sep	64		39	19	38	24		29		37	34				
BARIUM, DISSOLVED	2004-Oct															
BARIUM, DISSOLVED	2004-Sep	57		36	21	39	22		32			31				
BARIUM, DISSOLVED	2005-Sep	80		23	20	36	25		28		39	29				
BARIUM, DISSOLVED	2006-Sep	62.7		28.2	18.1	39.9	14.3		27.1		33.4	27.8				
BARIUM, DISSOLVED	2007-Sep	60.3		22.3	22.2	29.4	28		22.2			26.3				
BARIUM, DISSOLVED	2008-Sep	86.9		30.3	20.2	34.3 pH>2	21.2		40.9		34.8	25.5				
BARIUM, DISSOLVED	2009-Sep	163		26	19	32.4	16.1		20.7		32.3	22.9				
BARIUM, DISSOLVED	2010-Aug	77.4														
BARIUM, DISSOLVED	2010-Sep			24.7	15.1	21.2	<10		20.9 S3		27	23.9				
BARIUM, DISSOLVED	2011-Sep	73.3		22.6	13.9	26.4	14		22.9			22.1				
BARIUM, DISSOLVED	2012-Sep	70.3		23.6	17.1	38.3	24.5		21.8			26.8				
BARIUM	2013-Sep															
BARIUM, DISSOLVED	2013-Sep	70		23	19	27	31		24		35	25				
BARIUM	2014-Sep															
BARIUM, DISSOLVED	2014-Sep	50		24 B	24 B	36 B	37 B		23 B		32 B					
BARIUM	2015-Dec															
BARIUM, DISSOLVED	2015-Dec												62	66	27	89
BARIUM	2015-Sep															
BARIUM, DISSOLVED	2015-Sep	82.6		31.2	17.9	39.4		37.7		90.5			79.4	74.4	33.9	97.5
BARIUM	2016-Jun															
BARIUM, DISSOLVED	2016-Jun												54.5	49.5	35.3	73.9
BARIUM	2016-Mar															
BARIUM, DISSOLVED	2016-Mar												59	59	38	92
BARIUM	2016-Sep															
BARIUM, DISSOLVED	2016-Sep	69.5		25.7	17.4	35.1		29.5		80.6	23.3		67.2	50.2	30.4	79.3
BARIUM	2017-Aug	61		21	18.2	26.8		40.6		49.7	19.4		54.2	40	22.7	35.4
BARIUM	2018-Aug			15.5	19.9	19.3		80.5		46.4	20.2		58.4	75.9	25.2	37.1
BARIUM	2019-Apr	81														
BARIUM	2019-Aug		75	32	19	12		37		44	47		50	28	24	34

GW Standard:
MCL = 2000

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BARIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
BARIUM, DISSOLVED	1995-Aug										46						
BARIUM, DISSOLVED	1995-Oct										75						
BARIUM, DISSOLVED	1996-Apr						97		64		33						
BARIUM, DISSOLVED	1996-Jan																
BARIUM, DISSOLVED	1996-Jul						124		101		59		59				
BARIUM, DISSOLVED	1997-Oct																
BARIUM, DISSOLVED	1998-Apr						95		67		58		47				
BARIUM, DISSOLVED	1998-Oct						95		78		82		47				
BARIUM, DISSOLVED	1999-Sep										99		81				
BARIUM, DISSOLVED	2000-Sep										133		54				
BARIUM, DISSOLVED	2001-Sep						196				110		147				
BARIUM, DISSOLVED	2002-Sep										92		101				
BARIUM, DISSOLVED	2003-Sep										58		167				
BARIUM, DISSOLVED	2004-Oct										87						
BARIUM, DISSOLVED	2004-Sep						169						114				
BARIUM, DISSOLVED	2005-Sep										83		162				
BARIUM, DISSOLVED	2006-Sep										65.7		109				
BARIUM, DISSOLVED	2007-Sep						160		53.8		80.6		85.4				
BARIUM, DISSOLVED	2008-Sep						196		105		79	105	35.3				
BARIUM, DISSOLVED	2009-Sep						133				95.6		21.7				
BARIUM, DISSOLVED	2010-Aug																
BARIUM, DISSOLVED	2010-Sep						142		64.8		109	106	121				
BARIUM, DISSOLVED	2011-Sep												52.3				
BARIUM, DISSOLVED	2012-Sep				35.9						79.3		25.7				
BARIUM	2013-Sep													34			
BARIUM, DISSOLVED	2013-Sep										43	130	230				<10
BARIUM	2014-Sep					26								46	34		<0.61
BARIUM, DISSOLVED	2014-Sep						100		52		60	56	48				
BARIUM	2015-Dec	42						<15		<15						69	<0.52
BARIUM, DISSOLVED	2015-Dec	49 D9															
BARIUM	2015-Sep	49.2		27							54.7	272	115	69.5		140	<0.52
BARIUM, DISSOLVED	2015-Sep	53 D9															
BARIUM	2016-Jun	61														138	0.31 B
BARIUM, DISSOLVED	2016-Jun	61.5 D9															
BARIUM	2016-Mar	39.7														72.4	<0.58
BARIUM, DISSOLVED	2016-Mar	43															
BARIUM	2016-Sep	41.1		28.3							63.7		44.7	8.8		72.4	<0.14
BARIUM, DISSOLVED	2016-Sep																
BARIUM	2017-Aug	40.1		33.8							54.8		195	12.5		98.5	0.17 B
BARIUM	2018-Aug	38.3		34.2							65.1		116	10.1		77	<0.34
BARIUM	2019-Apr																<0.84
BARIUM	2019-Aug	30	50	37							60	140	120	93		77	<0.84

GW Standard:
MCL = 2000

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BERYLLIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
BERYLLIUM, DISSOLVED	1999-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2000-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2001-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2002-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2003-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2004-Oct															
BERYLLIUM, DISSOLVED	2004-Sep	<10		<10	<10	<10	<10		<10			<10				
BERYLLIUM, DISSOLVED	2005-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2006-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2007-Sep	<10		<10	<10	<10	<10		<10			<10				
BERYLLIUM, DISSOLVED	2008-Sep	<10		<10	<10	<10 pH>2	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2009-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
BERYLLIUM, DISSOLVED	2010-Aug	11														
BERYLLIUM, DISSOLVED	2010-Sep			<10	<10	<10	34.8		<10 S3		<10	<10				
BERYLLIUM, DISSOLVED	2011-Sep	<10		<10	<10	<10	<10		<10			<10				
BERYLLIUM, DISSOLVED	2012-Sep	<1		<1	<1	1.92	<1		<1			<1				
BERYLLIUM	2013-Sep															
BERYLLIUM, DISSOLVED	2013-Sep	<1		<1	<1	<1	<1		<1		<1	<1				
BERYLLIUM	2014-Sep															
BERYLLIUM, DISSOLVED	2014-Sep	<0.3		<0.3	<0.3	<0.3	<0.3		<0.3		<0.3					
BERYLLIUM	2015-Dec															
BERYLLIUM, DISSOLVED	2015-Dec												<0.17	0.18	<0.17	<0.17
BERYLLIUM	2015-Sep															
BERYLLIUM, DISSOLVED	2015-Sep	0.34		0.74	<0.17	0.18		<0.17		<0.17			<0.17	<0.17	<0.17	<0.17
BERYLLIUM	2016-Jun															
BERYLLIUM, DISSOLVED	2016-Jun												<0.08	<0.08	<0.08	<0.08
BERYLLIUM	2016-Mar															
BERYLLIUM, DISSOLVED	2016-Mar												<0.26	<0.26	<0.26	<0.26
BERYLLIUM	2016-Sep															
BERYLLIUM, DISSOLVED	2016-Sep	<0.08		<0.08	<0.08	<0.08		<0.08		<0.08	<0.08		<0.08	<0.08	<0.16 D3	<0.08
BERYLLIUM	2017-Aug	<0.012		0.019	<0.012	<0.012		<0.012		0.016	<0.012		<0.012	0.02	0.013 M1	0.025
BERYLLIUM	2018-Aug			<0.12	<0.12	<0.12		<0.12		<0.12	<0.12		<0.12	<0.12	<0.12	<0.12
BERYLLIUM	2019-Apr	<0.27														
BERYLLIUM	2019-Aug		<0.27	<0.27	<0.27	<0.27		<0.27		<0.27	<0.27		<0.27	<0.27	<0.27	<0.27

GW Standard:
MCL = 4

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BERYLLIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GC5	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
BERYLLIUM, DISSOLVED	1999-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2000-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2001-Sep						<10				<10		<10				
BERYLLIUM, DISSOLVED	2002-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2003-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2004-Oct										<10						
BERYLLIUM, DISSOLVED	2004-Sep						<10						<10				
BERYLLIUM, DISSOLVED	2005-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2006-Sep										<10		<10				
BERYLLIUM, DISSOLVED	2007-Sep						<10		<10		<10		<10				
BERYLLIUM, DISSOLVED	2008-Sep						<10		<10		<10	<10	<10				
BERYLLIUM, DISSOLVED	2009-Sep						<10				<10		<10				
BERYLLIUM, DISSOLVED	2010-Aug																
BERYLLIUM, DISSOLVED	2010-Sep						<10		<10		<10	<10	<10				
BERYLLIUM, DISSOLVED	2011-Sep												<10				
BERYLLIUM, DISSOLVED	2012-Sep				1.19						<1		<1				
BERYLLIUM	2013-Sep													<1			
BERYLLIUM, DISSOLVED	2013-Sep										<1	<1	<1				<1
BERYLLIUM	2014-Sep					<0.3								<0.3	<0.3		<0.3
BERYLLIUM, DISSOLVED	2014-Sep						<0.3		<0.3		<0.3	<0.3	<0.3				
BERYLLIUM	2015-Dec	<0.17														<0.17	<0.17
BERYLLIUM, DISSOLVED	2015-Dec	<0.17															
BERYLLIUM	2015-Sep	<0.17		<0.17							<0.17	<0.17	<0.17	<0.17		<0.17	<0.17
BERYLLIUM, DISSOLVED	2015-Sep	<0.17						<15		<15							
BERYLLIUM	2016-Jun	<0.08														<0.08	<0.08
BERYLLIUM, DISSOLVED	2016-Jun	<0.08															
BERYLLIUM	2016-Mar	<0.26														<0.26	<0.26
BERYLLIUM, DISSOLVED	2016-Mar	<0.26															
BERYLLIUM	2016-Sep	<0.08		<0.08							<0.08		<0.08	<0.08		<0.08	<0.08
BERYLLIUM, DISSOLVED	2016-Sep																
BERYLLIUM	2017-Aug	<0.012		<0.012							<0.012		<0.012	<0.012		<0.012	<0.012
BERYLLIUM	2018-Aug	<0.12		<0.12							<0.16		<0.12	<0.12		<0.12	<0.12
BERYLLIUM	2019-Apr																<0.27
BERYLLIUM	2019-Aug	<0.27	<0.27	<0.27							<0.27	<0.27	<0.27	<0.27		<0.27	<0.27

GW Standard:
MCL = 4

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BORON
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-07P	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
BORON, DISSOLVED	2007-Sep	<100			1550	1740	1750	1060		1550			1460				
BORON, DISSOLVED	2008-Sep	100			1670	1950	2070 pH>2	1090		1660		1160	1580				
BORON, DISSOLVED	2009-Sep	<100		866	1470	1860	1840	1070		1520		1130	1460				
BORON, DISSOLVED	2010-Aug	123															
BORON, DISSOLVED	2010-Sep			507	1410	1880	1900	1060		1600		1590	1470				
BORON, DISSOLVED	2011-Sep	<100			1440	1820	1860	1230		1480			1400				
BORON, DISSOLVED	2012-Sep	104		1100	1590	2010	2020	800		1680			1630				
BORON	2013-Sep																
BORON, DISSOLVED	2013-Sep	<100			1400	1800	1800	550		1500		1200	1500				
BORON	2014-Sep																
BORON, DISSOLVED	2014-Sep	120			1400	1800	1800	520		1500		740					
BORON	2015-Dec																
BORON, DISSOLVED	2015-Dec													51	630	2000	470
BORON	2015-Sep																
BORON, DISSOLVED	2015-Sep	75.6			1530	1840	1950		1380		2260			62.5	660	1880	740
BORON	2016-Jun																
BORON, DISSOLVED	2016-Jun													<50	535	1880	384
BORON	2016-Mar																
BORON, DISSOLVED	2016-Mar													<50	580	2000	530
BORON	2016-Sep																
BORON, DISSOLVED	2016-Sep	84			1450	1920	1890		1450		2260	931		56.6	622	1890	484
BORON	2017-Aug	76			1430	2000	2010		1380		2130	1170		51.8	733	1770	302
BORON	2018-Aug				1530	2090	2160		1310		2140	1110		64.2	855	1920	338
BORON	2019-Apr	110 J															
BORON	2019-Aug		110 J,B		1600 B	1700 B	1700 B		1000		1700	580		<110	660	1400 B	310 B
Boron	2-Year Avg.	80		--	1480	2045	2085	--	1345	--	2135	1140	--	58	794	1845	320

GW Standard:
None

Note: Average of previous 2 years (2016-2017) is calculated for parameters that do not have an MCL, SMCL, or HAL. For parameters that were not detected, the detection limit is used in the calculation.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

BORON
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERD RAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2
BORON, DISSOLVED	2007-Sep						<100		178		1220		468			
BORON, DISSOLVED	2008-Sep						<100		<100		1570	<100	1120			
BORON, DISSOLVED	2009-Sep						<100				1120		1270			
BORON, DISSOLVED	2010-Aug															
BORON, DISSOLVED	2010-Sep						<100		<100		857	<100	240			
BORON, DISSOLVED	2011-Sep												1740			
BORON, DISSOLVED	2012-Sep				1860						2180		1570			
BORON	2013-Sep													3700		
BORON, DISSOLVED	2013-Sep										820	250	850			
BORON	2014-Sep					1600								2400	3300	
BORON, DISSOLVED	2014-Sep						<50		<50		510	<50	300			
BORON	2015-Dec	240														460
BORON, DISSOLVED	2015-Dec	250 D9														
BORON	2015-Sep	425		952							846	62.1	802	1350		679
BORON, DISSOLVED	2015-Sep	442 D9														
BORON	2016-Jun	610														455
BORON, DISSOLVED	2016-Jun	629 D9														
BORON	2016-Mar	223														422
BORON, DISSOLVED	2016-Mar	220														
BORON	2016-Sep	520		820							846		597	4550		570
BORON, DISSOLVED	2016-Sep															
BORON	2017-Aug	660		862							1120		852	5330		820
BORON	2018-Aug	1020		867							1010		703	5440		1270
BORON	2019-Apr															
BORON	2019-Aug	260 B	330 B	830 B							530 B	<110	780 B	1900 B		1400 B
Boron	2-Year Avg.	590	--	864.5	--	--	--	--	--	--	1065	--	777.5	5385	--	1045

GW Standard:
None

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

COBALT
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
COBALT, DISSOLVED	1999-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COBALT, DISSOLVED	2000-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COBALT, DISSOLVED	2001-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COBALT, DISSOLVED	2002-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COBALT, DISSOLVED	2003-Sep	<20		<20	<20	<20	<20		<20		24	<20				
COBALT, DISSOLVED	2004-Oct															
COBALT, DISSOLVED	2004-Sep	<20		<20	<20	<20	<20		<20			<20				
COBALT, DISSOLVED	2005-Sep	<20		<20	<20	<20	25		<20		22	<20				
COBALT, DISSOLVED	2006-Sep	<20		<20	<20	<20	<20		<20		31.4	<20				
COBALT, DISSOLVED	2007-Sep	<20		<20	<20	<20	<20		<20			<20				
COBALT, DISSOLVED	2008-Sep	<20		<20	<20	<20 pH>2	<20		<20		<20	<20				
COBALT, DISSOLVED	2009-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COBALT, DISSOLVED	2010-Aug	2.72 J														
COBALT, DISSOLVED	2010-Sep			3.01 J	5.31 J	6.23 J	11.4 J		3.94 J		<1.55	<1.55				
COBALT, DISSOLVED	2011-Sep	<1.55		<1.55	<1.55	<1.55	<1.55		<1.55			<1.55				
COBALT, DISSOLVED	2012-Sep	<1.55			<1.55	2.71 J	<1.55		<1.55			<1.55				
COBALT	2013-Sep															
COBALT, DISSOLVED	2013-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
COBALT	2014-Sep															
COBALT, DISSOLVED	2014-Sep	1.3 J		<0.79	1.2 J	1.4 J	<0.79		1.7 J		0.81 J					
COBALT	2015-Dec															
COBALT, DISSOLVED	2015-Dec												<0.1	0.35	0.46	6.6
COBALT	2015-Sep															
COBALT, DISSOLVED	2015-Sep	0.16		0.39	0.64	1.7		3		1.3			<0.1	0.47	1.1	2.5
COBALT	2016-Jun															
COBALT, DISSOLVED	2016-Jun												<0.5	<0.5	0.91	5.3
COBALT	2016-Mar															
COBALT, DISSOLVED	2016-Mar												<0.5	<0.5	<0.5	2.8
COBALT	2016-Sep															
COBALT, DISSOLVED	2016-Sep	<0.5		<1 D3	1.3	1.9		2.8		<1.5 D3	<0.5		<0.5	<0.5	<1.5 D3	2.6
COBALT	2017-Aug	0.049		0.36	1.3	1.4		2.6		0.92	0.054		0.028	0.26	0.86	11.1
COBALT	2018-Aug			0.19	1.3	0.47		3.6		0.97	0.22		<0.15	1.5	1.1	10.6
COBALT	2019-Apr	0.37 J														
COBALT	2019-Aug		<0.091	1.3	1.1	0.41 J		3.5		0.84	1.4		<0.091	0.13 J	1.3 J	7.9
Cobalt	2-Year Avg.	0.27		0.275	1.3	0.935	--	3.1		0.945	0.137	--	0.09	0.88	0.98	10.85

GW Standard:

None

Note: Average of previous 2 years (2016-2017) is calculated for parameters that do not have an MCL, SMCL, or HAL. For parameters that were not detected, the detection limit is used in the calculation.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

COBALT
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
COBALT, DISSOLVED	1999-Sep										<20		<20				
COBALT, DISSOLVED	2000-Sep										<20		<20				
COBALT, DISSOLVED	2001-Sep						<20				<20		<20				
COBALT, DISSOLVED	2002-Sep										<20		<20				
COBALT, DISSOLVED	2003-Sep										<20		<20				
COBALT, DISSOLVED	2004-Oct										<20						
COBALT, DISSOLVED	2004-Sep						<20						<20				
COBALT, DISSOLVED	2005-Sep										<20		<20				
COBALT, DISSOLVED	2006-Sep										<20		<20				
COBALT, DISSOLVED	2007-Sep						<20		<20		<20		<20				
COBALT, DISSOLVED	2008-Sep						<20		<20		<20	<20	<20				
COBALT, DISSOLVED	2009-Sep						<20				<20		<20				
COBALT, DISSOLVED	2010-Aug																
COBALT, DISSOLVED	2010-Sep						1.61 J		6.22 J		2.25 J	2.24 J	3.47 J				
COBALT, DISSOLVED	2011-Sep												<1.55				
COBALT, DISSOLVED	2012-Sep				2.76 J						<1.55		<1.55				
COBALT	2013-Sep													<5			
COBALT, DISSOLVED	2013-Sep										<5	<5	<5				<5
COBALT	2014-Sep					4.1								<0.79	2.4		<0.79
COBALT, DISSOLVED	2014-Sep						<0.79		<0.79		<0.79	<0.79	<0.79				
COBALT	2015-Dec	0.14														<0.1	<0.1
COBALT, DISSOLVED	2015-Dec	0.24															
COBALT	2015-Sep	4.1		8.8							0.32	3.1	0.45	0.19		0.12	<0.1
COBALT, DISSOLVED	2015-Sep	3.4															
COBALT	2016-Jun	2.7														<0.5	<0.5
COBALT, DISSOLVED	2016-Jun	2.5															
COBALT	2016-Mar	<0.5														<0.5	<0.5
COBALT, DISSOLVED	2016-Mar	<0.5															
COBALT	2016-Sep	4.6		1.1							<0.5		<0.5	<0.5		<0.5	<0.5
COBALT, DISSOLVED	2016-Sep																
COBALT	2017-Aug	10.2		1.3							0.21		0.74	0.18		0.12	<0.014
COBALT	2018-Aug	6.5		2.3							<0.87		0.25	0.2		<0.15	<0.15
COBALT	2019-Apr																<0.091
COBALT	2019-Aug	8.4	16	3.4							0.22 J	1.3	0.26 J	0.23 J		0.37 J	<0.091
Cobalt	2-Year Avg.	7.4	--	1.8	--	--	--	--	--	--	0.54	--	0.495	0.19	--	0.135	0.12

GW Standard:

None

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

COPPER
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
COPPER, DISSOLVED	1995-Aug	<20			<20	<20										
COPPER, DISSOLVED	1995-Oct	<20		<20	<20	<20			<20		<20	<20				
COPPER, DISSOLVED	1996-Apr	<30		<30	<30	<30			<30		<30	<30				
COPPER, DISSOLVED	1996-Jan	<30		<30	<30	<30			<30			<30				
COPPER, DISSOLVED	1996-Jul	<30		<30	<30	<30			<30		<30	<30				
COPPER, DISSOLVED	1997-Oct										<20					
COPPER, DISSOLVED	1998-Apr															
COPPER, DISSOLVED	1998-Oct						<20									
COPPER, DISSOLVED	1999-Sep						<20									
COPPER, DISSOLVED	2000-Sep						<20									
COPPER, DISSOLVED	2001-Sep						<20									
COPPER, DISSOLVED	2004-Oct															
COPPER, DISSOLVED	2004-Sep	<20		<20	<20	<20	<20		<20			<20				
COPPER, DISSOLVED	2005-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COPPER, DISSOLVED	2006-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COPPER, DISSOLVED	2007-Sep	<20		<20	<20	<20	<20		<20			<20				
COPPER, DISSOLVED	2008-Sep	<20		<20	<20	<20 pH>2	<20		<20		<20	<20				
COPPER, DISSOLVED	2009-Sep	<20		<20	<20	<20	<20		<20		<20	<20				
COPPER, DISSOLVED	2010-Aug	<20														
COPPER, DISSOLVED	2010-Sep			<20	<20	<20	<20		<20		<20	<20				
COPPER, DISSOLVED	2011-Sep	<20		<20	<20	<20	<20		<20			<20				
COPPER, DISSOLVED	2012-Sep	<20		<20	<20	<20	<20		<20			<20				
COPPER	2013-Sep															
COPPER, DISSOLVED	2013-Sep	<10		<10	<10	<10	<10		<10		<10	<10				
COPPER	2014-Sep															
COPPER, DISSOLVED	2014-Sep	15 J,B		4.1 J,B	6.7 J,B	3.9 J,B	4.6 J,B		4.2 J,B		3.6 J,B					
COPPER	2015-Dec															
COPPER, DISSOLVED	2015-Dec												1.4	1	<0.83	<0.83
COPPER	2015-Sep															
COPPER, DISSOLVED	2015-Sep	3.6 B		3.3 B	5.5 B	3.4 B		3 B		3.9 B			3.1 B	3.8 B	3.4 B	4.6 B
COPPER	2016-Jun															
COPPER, DISSOLVED	2016-Jun												2.2	0.94 B	2.1	3.5
COPPER	2016-Mar															
COPPER, DISSOLVED	2016-Mar												<1.1	<1.1	<1.1	<1.1
COPPER	2016-Sep															
COPPER, DISSOLVED	2016-Sep	1.1 B		0.49 B	0.73 B	0.64 B		0.53 B		0.51 B	1.5		0.85 B	1.1 B	1 B	1.2 B
COPPER	2017-Aug	0.99		0.94 B	0.62 B	0.54 B		0.38 B		0.97	0.52 B		0.32 B	0.92 B	0.23 B	0.61 B
COPPER	2018-Aug			<0.48	<0.48	0.6		2.7		<0.48	0.66		0.74	2.6	<0.48	0.57
COPPER	2019-Apr	2.1 J														
COPPER	2019-Aug		<2	<2	<2	<2		<2		<2	<2		<2	<2	<2	<2

GW Standard:
SMCL = 1000

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

COPPER
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
COPPER, DISSOLVED	1995-Aug										<20						
COPPER, DISSOLVED	1995-Oct										210						
COPPER, DISSOLVED	1996-Apr						<30		<30		<30						
COPPER, DISSOLVED	1996-Jan																
COPPER, DISSOLVED	1996-Jul						<30		<30		<30		<30				
COPPER, DISSOLVED	1997-Oct																
COPPER, DISSOLVED	1998-Apr						<20		<20		<20		<20				
COPPER, DISSOLVED	1998-Oct						<20		<20		<20		<20				
COPPER, DISSOLVED	1999-Sep										<20		<20				
COPPER, DISSOLVED	2000-Sep																
COPPER, DISSOLVED	2001-Sep																
COPPER, DISSOLVED	2004-Oct										<20						
COPPER, DISSOLVED	2004-Sep						<20						<20				
COPPER, DISSOLVED	2005-Sep										<20		<20				
COPPER, DISSOLVED	2006-Sep										<20		<20				
COPPER, DISSOLVED	2007-Sep						<20		<20		<20		<20				
COPPER, DISSOLVED	2008-Sep						<20		<20		<20	<20	<20				
COPPER, DISSOLVED	2009-Sep						<20				<20		<20				
COPPER, DISSOLVED	2010-Aug																
COPPER, DISSOLVED	2010-Sep						<20		<20		<20	<20	<20				
COPPER, DISSOLVED	2011-Sep												<20				
COPPER, DISSOLVED	2012-Sep				<20						<20		<20				
COPPER	2013-Sep													13			
COPPER, DISSOLVED	2013-Sep										<10	<10	<10				<10
COPPER	2014-Sep					1.5 J,B								8.7 J	8.2 J,B		<0.85
COPPER, DISSOLVED	2014-Sep						4.1 J,B		4.9 J,B		4.3 J,B	3.7 J,B	3.7 J,B				
COPPER	2015-Dec	2														1.7	8.2
COPPER, DISSOLVED	2015-Dec	1.2															
COPPER	2015-Sep	6.8 B		6.2 B							9.2 B	6.7 B	7.3 B	9.1 B		5.4 B	2.2 B
COPPER, DISSOLVED	2015-Sep	6.1 B															
COPPER	2016-Jun	0.37														0.66	<0.11
COPPER, DISSOLVED	2016-Jun	2.6 D9															
COPPER	2016-Mar	<1.1														<1.1	<1.1
COPPER, DISSOLVED	2016-Mar	<1.1															
COPPER	2016-Sep	0.25		0.74							1.1		0.28	1		0.52	<0.11
COPPER, DISSOLVED	2016-Sep																
COPPER	2017-Aug	0.3 B		1							0.55 B		0.64 B	1 B		0.38 B	0.073 B
COPPER	2018-Aug	0.8		1.6							4.5 B		<0.48	1		<0.48	<0.48
COPPER	2019-Apr																<2
COPPER	2019-Aug	<2	<2	<2							<2	<2	<2	<2		<2	<2

GW Standard:
SMCL = 1000

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

FLUORIDE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
FLUORIDE	1995-Aug	0.38			0.7	0.76										
FLUORIDE	1995-Oct	0.4		2.7	0.76	0.86			0.76		0.22	0.7				
FLUORIDE	1996-Apr	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2				
FLUORIDE	1996-Jan	<0.2		<0.2	<0.2	<0.2			<0.2			<0.2				
FLUORIDE	1996-Oct	<0.2		<0.2	<0.2	<0.2			<0.2		<0.2	<0.2				
FLUORIDE	2014-Sep	0.67		2.4	0.81	0.81	0.28									
FLUORIDE	2014-Sep								0.88		0.79					
FLUORIDE	2015-Dec												0.44	0.34	0.85	0.47
FLUORIDE	2015-Sep	0.45		2	0.68	0.7		0.22		0.48			0.36	0.26	0.44	0.32
FLUORIDE	2016-Jun												0.38	0.23	0.79	0.51
FLUORIDE	2016-Mar												0.51	0.35	0.75	0.67
FLUORIDE	2016-Sep	0.48		2.4	0.83	0.96		0.4		0.69	0.89		0.53	0.45	0.84	0.59
FLUORIDE	2017-Aug	0.58		2.5	0.71	0.89		0.39		0.58	0.78		0.53	0.44	0.74	0.61
FLUORIDE	2018-Aug			2.8	0.94	0.98		0.32		0.68	0.62		0.49	0.49	0.69	0.68
FLUORIDE	2019-Apr	0.35 J														
FLUORIDE	2019-Aug		0.85	0.76	<0.23	0.64		<0.23		<0.23	0.72	ater than or equal to the		<0.23	<0.23	0.9

GW Standard:
SMCL = 2

IPL Ottumwa Midland Landfill
Historic Monitoring Results

FLUORIDE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
FLUORIDE	1995-Aug																
FLUORIDE	1995-Oct																
FLUORIDE	1996-Apr																
FLUORIDE	1996-Jan																
FLUORIDE	1996-Oct																
FLUORIDE	2014-Sep					0.67	0.32		0.34		0.59	0.3	0.47	0.45	0.64		<0.1
FLUORIDE	2014-Sep																
FLUORIDE	2015-Dec	0.53														0.25	<0.066
FLUORIDE	2015-Sep	0.41		0.68							0.53	0.31	0.56	0.35		0.31	<0.066
FLUORIDE	2016-Jun	0.44														0.21	<0.073
FLUORIDE	2016-Mar	0.54														0.25	<0.073
FLUORIDE	2016-Sep	0.61		0.7							0.49		0.52	0.87		0.19	<0.027
FLUORIDE	2017-Aug	0.61		0.62							0.59		0.78	0.78		0.24	<0.1
FLUORIDE	2018-Aug	0.61		0.55							0.59		0.81	0.65		0.28	<0.063
FLUORIDE	2019-Apr																0.75
FLUORIDE	2019-Aug	0.55	<0.23	<0.23							0.62	<0.23	0.8	<0.23		<0.23	<0.045

GW Standard:
SMCL = 2

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

IRON
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
IRON, DISSOLVED	1995-Apr															
IRON, DISSOLVED	1995-Aug	<100			<100	<100										
IRON, DISSOLVED	1995-Oct	<100		110	140	<100			<100		330	<100				
IRON, DISSOLVED	1996-Apr	317		129	406	31			<30		<30	74				
IRON, DISSOLVED	1996-Jan	<30		53	<30	87			40			<30				
IRON, DISSOLVED	1996-Jul	<30		73	322	<30			<30		<30	83				
IRON, DISSOLVED	1996-Oct	<30		157	<30	48			<30		321	<30				
IRON, DISSOLVED	1997-Apr	<100		170	110	<100			190		<100	100				
IRON, DISSOLVED	1997-Oct	<100		180	120	<100			<100		<100	<100				
IRON, DISSOLVED	1998-Apr	<100		<100	120	<100					<100	500				
IRON, DISSOLVED	1998-Oct	<100		730	310	<100	<100		240			590				
IRON, DISSOLVED	1999-Sep	<100		<100	260	<100	<100		<100		140	320				
IRON, DISSOLVED	2000-Sep	<100		<100	270	110	<100		<100		540	<100				
IRON, DISSOLVED	2001-Sep	<100		<100	120	<100	<100		<100		<100	<100				
IRON, DISSOLVED	2002-Sep	<100		160	150	<100	<100		<100		<100	170				
IRON, DISSOLVED	2003-Sep	<100		100	230	<100	<100		100		800	110				
IRON, DISSOLVED	2004-Oct															
IRON, DISSOLVED	2004-Sep	<100		<100	120	<100	<100		180			<100				
IRON, DISSOLVED	2005-Sep	<100		<100	170	<100	160		<100		<100	<100				
IRON, DISSOLVED	2006-Sep	<100		686	<100	<100	<100		<100		<100	<100				
IRON, DISSOLVED	2007-Sep	<100		111	<100	<100	102		<100			<100				
IRON, DISSOLVED	2008-Sep	<100		670	176	<100 pH>2	<100		1040		<100	<100				
IRON, DISSOLVED	2009-Sep	6300		331	<100	<100	<100		<100		<100	<100				
IRON, DISSOLVED	2010-Aug	<100														
IRON, DISSOLVED	2010-Sep			1440	317	131	<100		<100		<100	182				
IRON, DISSOLVED	2011-Sep	<100		<100	156	<100	<100		<100			<100				
IRON, DISSOLVED	2012-Sep	<100		<100	238	<100	<100		<100			<100				
IRON	2013-Sep															
IRON, DISSOLVED	2013-Sep	<50		<50	110	<50	64		<50		<50	120				
IRON	2014-Sep															
IRON, DISSOLVED	2014-Sep	<24		<24	110	81	<24		<24		<24					
IRON	2015-Dec															
IRON, DISSOLVED	2015-Dec												16	20	23000	430
IRON	2015-Sep															
IRON, DISSOLVED	2015-Sep	16.4		20.4	310	32.2		1880		91.7			11.3	<9	5680	158
IRON	2016-Jun															
IRON, DISSOLVED	2016-Jun												<12.8	<12.8	9810	370
IRON	2016-Mar															
IRON, DISSOLVED	2016-Mar												<8.8	<8.8	16300	250
IRON	2016-Sep															
IRON, DISSOLVED	2016-Sep	<12.8		<25.5 D3	300	<25.5 D3		1980		273	20.4		22	231	14900	182
IRON	2017-Aug	12.5		473	324	91.5		2410		365	<9.6		16.2	140	5230	983
IRON	2018-Aug			27.1 B	155 B	81.8 B		5580		266	<14.9		86.3 B	949	5330	1300
IRON	2019-Apr	380														
IRON	2019-Aug		<66	180	290	230		2600		430	160		<66	<66	5200	3500

GW Standard:
SMCL = 300

IPL Ottumwa Midland Landfill
Historic Monitoring Results

IRON
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
IRON, DISSOLVED	1995-Apr										<100						
IRON, DISSOLVED	1995-Aug																
IRON, DISSOLVED	1995-Oct										<100						
IRON, DISSOLVED	1996-Apr						<30		<30		<30						
IRON, DISSOLVED	1996-Jan																
IRON, DISSOLVED	1996-Jul						<30		430		<30		<30				
IRON, DISSOLVED	1996-Oct										123		115				
IRON, DISSOLVED	1997-Apr						<100		<100		<100						
IRON, DISSOLVED	1997-Oct										<100						
IRON, DISSOLVED	1998-Apr						<100		<100		<100		<100				
IRON, DISSOLVED	1998-Oct						170		170		<100		<100				
IRON, DISSOLVED	1999-Sep										<100		<100				
IRON, DISSOLVED	2000-Sep										<100		<100				
IRON, DISSOLVED	2001-Sep						<100				<100		<100				
IRON, DISSOLVED	2002-Sep										<100		<100				
IRON, DISSOLVED	2003-Sep										<100		<100				
IRON, DISSOLVED	2004-Oct										<100						
IRON, DISSOLVED	2004-Sep						<100						<100				
IRON, DISSOLVED	2005-Sep										<100		740				
IRON, DISSOLVED	2006-Sep										<100		<100				
IRON, DISSOLVED	2007-Sep						<100		<100		<100		<100				
IRON, DISSOLVED	2008-Sep						<100		<100		<100	<100	<100				
IRON, DISSOLVED	2009-Sep						<100				<100		101				
IRON, DISSOLVED	2010-Aug																
IRON, DISSOLVED	2010-Sep						<100		<100		<100	<100	<100				
IRON, DISSOLVED	2011-Sep												<100				
IRON, DISSOLVED	2012-Sep				153						<100		<100				
IRON	2013-Sep													140			
IRON, DISSOLVED	2013-Sep										<50	100	<50				<50
IRON	2014-Sep					260								960	2400		<24
IRON, DISSOLVED	2014-Sep						130		170		<24	100	25				
IRON	2015-Dec	13														41	<9
IRON, DISSOLVED	2015-Dec	<9															
IRON	2015-Sep	140		1570							196	806	233	84.5		<9	<9
IRON, DISSOLVED	2015-Sep	37.8															
IRON	2016-Jun	<12.8														42.8	<12.8
IRON, DISSOLVED	2016-Jun	<12.8															
IRON	2016-Mar	<8.8														<8.8	<8.8
IRON, DISSOLVED	2016-Mar	<8.8															
IRON	2016-Sep	<12.8		1570							228		85.9	29.7		49.6	13.5
IRON, DISSOLVED	2016-Sep																
IRON	2017-Aug	<9.6		1370							52.9		581	38.8		<9.6	<9.6
IRON	2018-Aug	<14.9		4690							59.8		186 B	31.3 B,M1		6.2	<14.9
IRON	2019-Apr																<66
IRON	2019-Aug	<66	510	4700							77 J	1300	110	67 J		370	<66

GW Standard:
SMCL = 300

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

LEAD
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
LEAD, DISSOLVED	1995-Aug	<5			<5	<5										
LEAD, DISSOLVED	1995-Oct	<5		<5	<5	<5			<5		<5	<5				
LEAD, DISSOLVED	1996-Apr	<5		<5	<5	<5			<5		<5	<5				
LEAD, DISSOLVED	1996-Jan	<5		<5	<5	<5			<5			<5				
LEAD, DISSOLVED	1996-Jul	<5		<5	<5	<5			<5		<5	<5				
LEAD, DISSOLVED	1997-Oct										<4					
LEAD, DISSOLVED	1998-Apr															
LEAD, DISSOLVED	1998-Oct						<4									
LEAD, DISSOLVED	1999-Sep						<4									
LEAD, DISSOLVED	2000-Sep						<4									
LEAD, DISSOLVED	2001-Sep						<4									
LEAD, DISSOLVED	2004-Oct															
LEAD, DISSOLVED	2004-Sep	<4		<4	<4	<4	<4		<4			<4				
LEAD, DISSOLVED	2005-Sep	<4 WT		<4 WT	<4 WT	<4 WT	<4 WT		<4 WT		<4 WT	<4 WT				
LEAD, DISSOLVED	2006-Sep	<4		<4	<4	<4	<4		<4		<4	<4				
LEAD, DISSOLVED	2007-Sep	<4		<4	<4	<4	<4		<4			<4				
LEAD, DISSOLVED	2008-Sep	<4		<4	<4	<4 pH>2	<4		<4		<4	<4				
LEAD, DISSOLVED	2009-Sep	<4		<4	<4	<4	<4		<4		<4	<4				
LEAD, DISSOLVED	2010-Aug	<4														
LEAD, DISSOLVED	2010-Sep			<4	<4	<4	<4		<4		<4	<4				
LEAD, DISSOLVED	2011-Sep	<4		<4	<4	<4	<4		<4			<4				
LEAD, DISSOLVED	2012-Sep	<4		<4	<4	<4	<4		<4			<4				
LEAD	2013-Sep															
LEAD, DISSOLVED	2013-Sep	<1		<1	<1	<1	<1		<1		<1	<1				
LEAD	2014-Sep															
LEAD, DISSOLVED	2014-Sep	0.19 J,B		0.18 J,B	0.22 J,B	0.2 J,B	0.17 J,B		0.17 J,B		0.17 J,B					
LEAD	2015-Dec															
LEAD, DISSOLVED	2015-Dec												2	<1.9	<1.9	<1.9
LEAD	2015-Sep															
LEAD, DISSOLVED	2015-Sep	<1.9		<1.9	<1.9	<1.9		<1.9		<1.9			2.4	<1.9	<1.9	<1.9
LEAD	2016-Jun															
LEAD, DISSOLVED	2016-Jun												<0.19	<0.19	<0.19	<0.19
LEAD	2016-Mar															
LEAD, DISSOLVED	2016-Mar												<2.5	<2.5	<2.5	<2.5
LEAD	2016-Sep															
LEAD, DISSOLVED	2016-Sep	<0.19		<0.19	<0.19	<0.19		<0.19		<0.39 D3	<0.19		<0.19	0.2	<0.39 D3	<0.19
LEAD	2017-Aug	0.18		0.38	<0.033	0.22		0.24		0.4	<0.033		0.039	0.41	0.036	0.041
LEAD	2018-Aug			<0.12	<0.12	0.12		0.63		<0.12	<0.12		<0.12	0.6	<0.12	<0.12
LEAD	2019-Apr	0.71														
LEAD	2019-Aug		<0.27	0.31 J	<0.27	<0.27		<0.27		<0.27	<0.27		<0.27	<0.27	<1.1	<0.27

GW Standard:
Action Level: 15

IPL Ottumwa Midland Landfill
Historic Monitoring Results

LEAD
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
LEAD, DISSOLVED	1995-Aug										<5						
LEAD, DISSOLVED	1995-Oct										<5						
LEAD, DISSOLVED	1996-Apr						<5		<5		<5						
LEAD, DISSOLVED	1996-Jan																
LEAD, DISSOLVED	1996-Jul						<5		<5		<5		<5				
LEAD, DISSOLVED	1997-Oct																
LEAD, DISSOLVED	1998-Apr						<4		<4				<4				
LEAD, DISSOLVED	1998-Oct						<4		<4				<4				
LEAD, DISSOLVED	1999-Sep												<4				
LEAD, DISSOLVED	2000-Sep												<4				
LEAD, DISSOLVED	2001-Sep												<4				
LEAD, DISSOLVED	2004-Oct										<4						
LEAD, DISSOLVED	2004-Sep						<4						<4				
LEAD, DISSOLVED	2005-Sep										<4 WT		<4				
LEAD, DISSOLVED	2006-Sep										<4		<4				
LEAD, DISSOLVED	2007-Sep						<4		<4		<4		<4				
LEAD, DISSOLVED	2008-Sep						<4		<4		<4	<4	<4				
LEAD, DISSOLVED	2009-Sep						<4				<4		<4				
LEAD, DISSOLVED	2010-Aug																
LEAD, DISSOLVED	2010-Sep						<4		<4		<4	<4	<4				
LEAD, DISSOLVED	2011-Sep												<4				
LEAD, DISSOLVED	2012-Sep				<4						<4		<4				
LEAD	2013-Sep													<2 D3			
LEAD, DISSOLVED	2013-Sep										<1	<1	<1				<1
LEAD	2014-Sep					0.16 J,B								0.78 J,B	6.2		0.12 J,B
LEAD, DISSOLVED	2014-Sep						0.22 J,B		0.32 J,B		0.17 J,B	0.22 J,B	0.18 J,B				
LEAD	2015-Dec	<1.9														<1.9	<1.9
LEAD, DISSOLVED	2015-Dec	<1.9															
LEAD	2015-Sep	3.8 B		3.3 B							<1.9	<1.9	3.2 B	3.2 B		<1.9	<1.9
LEAD, DISSOLVED	2015-Sep	2.6															
LEAD	2016-Jun	<0.19														<0.19	<0.19
LEAD, DISSOLVED	2016-Jun	<0.19															
LEAD	2016-Mar	<2.5														<2.5	<2.5
LEAD, DISSOLVED	2016-Mar	<2.5															
LEAD	2016-Sep	<0.19		<0.19							0.23		<0.19	<0.19		<0.19	<0.19
LEAD, DISSOLVED	2016-Sep																
LEAD	2017-Aug	<0.033		0.33							0.1		0.33	<0.066 D3		<0.033	<0.033
LEAD	2018-Aug	<0.12		0.66							<3		<0.12	<0.24 D3		<0.12	<0.12
LEAD	2019-Apr																<0.27
LEAD	2019-Aug	<1.1	0.34 J	<0.27							<0.27	<0.27	<0.27	<0.27		0.42 J	<0.27

GW Standard:
Action Level: 15

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

MAGNESIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
MAGNESIUM, DISSOLVED	1995-Aug	58000			87000	31000										
MAGNESIUM, DISSOLVED	1995-Oct	56000		7800	82000	29000			33000		140000	43000				
MAGNESIUM, DISSOLVED	1996-Apr	50300		8230	76400	28200			35700		97000	43100				
MAGNESIUM, DISSOLVED	1996-Jan	60100		10300	83100	32300			29300			31200				
MAGNESIUM, DISSOLVED	1996-Jul	57300		6790	73000	29800			29400		<100	39700				
MAGNESIUM, DISSOLVED	1996-Oct					30600										
MAGNESIUM, DISSOLVED	1997-Apr	51000			62000	29000			31000		78000	36000				
MAGNESIUM, DISSOLVED	1997-Oct	56000			59000	30000			29000		62000	39000				
MAGNESIUM, DISSOLVED	1998-Apr	62000			54000	29000					42000	37000				
MAGNESIUM, DISSOLVED	1998-Oct	59000			55000	29000	200000		25000			39000				
MAGNESIUM, DISSOLVED	1999-Sep	60000		9500	50000	29000	190000		29000		47000	36000				
MAGNESIUM, DISSOLVED	2000-Sep	47000		9600	50000	31000	200000		29000		25000	34000				
MAGNESIUM, DISSOLVED	2001-Sep	35000		14800	49400	31400	186000		29500		40600	31900 *MSO				
MAGNESIUM, DISSOLVED	2002-Sep	40000		24000	47000	31000	200000		27000		48000	36000				
MAGNESIUM, DISSOLVED	2003-Sep	41300		22700	47800	30700	203000		32100		86600	31600				
MAGNESIUM, DISSOLVED	2004-Oct															
MAGNESIUM, DISSOLVED	2004-Sep	29000		19000 N*	46000	32000	200000		31000			31000				
MAGNESIUM, DISSOLVED	2005-Sep	41000		11000	50000 N*	33000	210000		31000		69000	35000				
MAGNESIUM, DISSOLVED	2006-Sep	29500		11300	44900	34800	200000		30600		104000	32000				
MAGNESIUM, DISSOLVED	2007-Sep	28700		9990	44400	30600	199000		33900			28600				
MAGNESIUM, DISSOLVED	2008-Sep	45400		10900 MHA	50600	35100 pH>	204000		30600		29300	30700				
MAGNESIUM, DISSOLVED	2009-Sep	50100		9170	48900	34200	208000		34200		17600	29900				
MAGNESIUM, DISSOLVED	2010-Aug	64300														
MAGNESIUM, DISSOLVED	2010-Sep			7430	51400	31700	211000		33000		21400	26900				
MAGNESIUM, DISSOLVED	2011-Sep	61800		9310	50300	34300	237000		32000			26400				
MAGNESIUM, DISSOLVED	2012-Sep	52600		9420	52400	36100	121000		35400			28500				
MAGNESIUM	2013-Sep															
MAGNESIUM, DISSOLVED	2013-Sep	44600		8100	45200	31000	106000		32800		66000	28600				
MAGNESIUM	2014-Sep															
MAGNESIUM, DISSOLVED	2014-Sep	25600		7900	41700	30300	104000		22600		32800					
MAGNESIUM	2015-Dec															
MAGNESIUM, DISSOLVED	2015-Dec												39100	116000	242000	25000
MAGNESIUM	2015-Sep															
MAGNESIUM, DISSOLVED	2015-Sep	46300		7320	47000	31300		150000		71000			35300	92900	171000	22500
MAGNESIUM	2016-Jun															
MAGNESIUM, DISSOLVED	2016-Jun												33900 M1	88700	174000	18900
MAGNESIUM	2016-Mar															
MAGNESIUM, DISSOLVED	2016-Mar												37200	101000	205000	23400
MAGNESIUM	2016-Sep															
MAGNESIUM, DISSOLVED	2016-Sep	49500		8300	65400	32300		146000		85500	49200		36000	92600	198000	21500
MAGNESIUM	2017-Aug	48100		7830	61700	30400		139000		41700	58100		37000	72300	157000	17700
MAGNESIUM	2018-Aug			7230	60700	34200		146000		40400	84000		39600	70400	170000	20100
MAGNESIUM, DISSOLVED	2018-Aug															
MAGNESIUM	2019-Apr	31000														
MAGNESIUM	2019-Aug		14000	17000	60000	30000		140000		35000	24000		35000	59000	170000	14000
Magnesium	2-Year Avg.	48800		7530	61200	32300	--	142500	--	41050	71050	--	38300	71350	163500	18900

GW Standard:
None

Note: Average of previous 2 years (2016-2017) is calculated for parameters that do not have an MCL, SMCL, or HAL. For parameters that were not detected, the detection limit is used in the calculation.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

MAGNESIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
MAGNESIUM, DISSOLVED	1995-Aug										36000						
MAGNESIUM, DISSOLVED	1995-Oct										32000						
MAGNESIUM, DISSOLVED	1996-Apr						24000		34400		20900						
MAGNESIUM, DISSOLVED	1996-Jan																
MAGNESIUM, DISSOLVED	1996-Jul						18500		34200		14800		29500				
MAGNESIUM, DISSOLVED	1996-Oct																
MAGNESIUM, DISSOLVED	1997-Apr						18000		18000		28000						
MAGNESIUM, DISSOLVED	1997-Oct										27000						
MAGNESIUM, DISSOLVED	1998-Apr						17000		17000		26000		33000				
MAGNESIUM, DISSOLVED	1998-Oct						14000		14000		13000		23000				
MAGNESIUM, DISSOLVED	1999-Sep										25000		37000				
MAGNESIUM, DISSOLVED	2000-Sep										17000		27000				
MAGNESIUM, DISSOLVED	2001-Sep						29300				13800		18800				
MAGNESIUM, DISSOLVED	2002-Sep										22000 N*		28000				
MAGNESIUM, DISSOLVED	2003-Sep										42500		42600				
MAGNESIUM, DISSOLVED	2004-Oct										22900						
MAGNESIUM, DISSOLVED	2004-Sep						27000						26000				
MAGNESIUM, DISSOLVED	2005-Sep										36000		48000				
MAGNESIUM, DISSOLVED	2006-Sep										37900		49200				
MAGNESIUM, DISSOLVED	2007-Sep						28600		28200		23300		27800				
MAGNESIUM, DISSOLVED	2008-Sep						23800		21800 MHA		20400	12400	34300				
MAGNESIUM, DISSOLVED	2009-Sep						27000				16300 S3		25900				
MAGNESIUM, DISSOLVED	2010-Aug																
MAGNESIUM, DISSOLVED	2010-Sep						24900		12700		8710	14900	15200				
MAGNESIUM, DISSOLVED	2011-Sep												28400				
MAGNESIUM, DISSOLVED	2012-Sep				67400						47000		46500				
MAGNESIUM	2013-Sep													74400 M1			
MAGNESIUM, DISSOLVED	2013-Sep										26200	18500	30400				<50
MAGNESIUM	2014-Sep					73700								45600	54200		<17
MAGNESIUM, DISSOLVED	2014-Sep						9300		7700		17200	5200	13900				
MAGNESIUM	2015-Dec	42500														8500	14
MAGNESIUM, DISSOLVED	2015-Dec	45800 D9															
MAGNESIUM	2015-Sep	58800		38600							35000	31200	36200	29800		8460	<13.3
MAGNESIUM, DISSOLVED	2015-Sep	58700															
MAGNESIUM	2016-Jun	72500														9930	<15.8
MAGNESIUM, DISSOLVED	2016-Jun	67000															
MAGNESIUM	2016-Mar	44200														9740	<15.8
MAGNESIUM, DISSOLVED	2016-Mar	44600															
MAGNESIUM	2016-Sep	63600		82600							38300		33500	89200		9160	<15.8
MAGNESIUM, DISSOLVED	2016-Sep																
MAGNESIUM	2017-Aug	76100		81400							47800		47900	82600		14700	<15.4
MAGNESIUM	2018-Aug	114000		103000							36500		51400	88700		22400	<14
MAGNESIUM, DISSOLVED	2018-Aug															20200	
MAGNESIUM	2019-Apr																120 J
MAGNESIUM	2019-Aug	51000	64000	33000							22000	18000	32000	25000		12000	<29
Magnesium	2-Year Avg.	69850	--	92200	--	--	--	--	--	--	42150	--	49650	85650	--	21300	15.6

GW Standard:
None

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

MANGANESE
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
MANGANESE, DISSOLVED	1999-Sep	<10		546	234	286	3400		267		3700	166				
MANGANESE, DISSOLVED	2000-Sep	<10		329	177	338	3400		180		5900	170				
MANGANESE, DISSOLVED	2001-Sep	<10		529	278	238	1700		186		7070	192				
MANGANESE, DISSOLVED	2002-Sep	31		697	255	319	1000		212		8300	178				
MANGANESE, DISSOLVED	2003-Sep	<10		588	187	227	1400		156		8610	185				
MANGANESE, DISSOLVED	2004-Oct															
MANGANESE, DISSOLVED	2004-Sep	<10		555	215	207	967		170			109				
MANGANESE, DISSOLVED	2005-Sep	18		280	182	230	1900		226		8400	173				
MANGANESE, DISSOLVED	2006-Sep	15		387 S	191	246	1080		235		12900	171				
MANGANESE, DISSOLVED	2007-Sep	15.1		249	157	142	2880		173			103				
MANGANESE, DISSOLVED	2008-Sep	<10		273	164	219 pH>2	1130		220		411	102				
MANGANESE, DISSOLVED	2009-Sep	515		249	215	243	1180		142		15.9	83.1				
MANGANESE, DISSOLVED	2010-Aug	<10														
MANGANESE, DISSOLVED	2010-Sep			170	137	165	930		93.8 S3		<10	127				
MANGANESE, DISSOLVED	2011-Sep	<10		347	144	192	343		153			91				
MANGANESE, DISSOLVED	2012-Sep	30.1		66.1	140	316	305		118			120				
MANGANESE	2013-Sep															
MANGANESE, DISSOLVED	2013-Sep	6.6		250	140	180	240		140		1600	160				
MANGANESE	2014-Sep															
MANGANESE, DISSOLVED	2014-Sep	18		55	130	280	270		270		280					
MANGANESE	2015-Dec															
MANGANESE, DISSOLVED	2015-Dec												<2.4	390	1600	1100
MANGANESE	2015-Sep															
MANGANESE, DISSOLVED	2015-Sep	11.1		362	104	435		4570		777			8.8	658	714	1100
MANGANESE	2016-Jun															
MANGANESE, DISSOLVED	2016-Jun												3.4 B	120	986	965
MANGANESE	2016-Mar															
MANGANESE, DISSOLVED	2016-Mar												7.2	310	1300	990
MANGANESE	2016-Sep															
MANGANESE, DISSOLVED	2016-Sep	10.7		319	136	408		3160		583	28.6		4.9	48	1250	880
MANGANESE	2017-Aug	2		176	170	213		2990		415	10.8		0.9 B	74.1	558 M1	1150
MANGANESE	2018-Aug			114	178	93.7		3010		329	170		5.6	210	574	1100
MANGANESE	2019-Apr	20														
MANGANESE	2019-Aug		2.8 J	370	180	87		2600		330	440		<2.5	44	550	970

GW Standard:
SMCL = 50

IPL Ottumwa Midland Landfill
Historic Monitoring Results

MANGANESE
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
MANGANESE, DISSOLVED	1999-Sep										<10		42				
MANGANESE, DISSOLVED	2000-Sep										<10		281				
MANGANESE, DISSOLVED	2001-Sep						1870				<10		50				
MANGANESE, DISSOLVED	2002-Sep										<10		62				
MANGANESE, DISSOLVED	2003-Sep										<10		52				
MANGANESE, DISSOLVED	2004-Oct										<10						
MANGANESE, DISSOLVED	2004-Sep						2300						135				
MANGANESE, DISSOLVED	2005-Sep										11		335				
MANGANESE, DISSOLVED	2006-Sep										11.3		66.8				
MANGANESE, DISSOLVED	2007-Sep						1370		<10		30.3		49.8				
MANGANESE, DISSOLVED	2008-Sep						350		35.6		<10	55	118				
MANGANESE, DISSOLVED	2009-Sep						646				<10		36.8				
MANGANESE, DISSOLVED	2010-Aug																
MANGANESE, DISSOLVED	2010-Sep						1150		69.3		<10	185	86.9				
MANGANESE, DISSOLVED	2011-Sep												<10				
MANGANESE, DISSOLVED	2012-Sep				192						<10		10.8				
MANGANESE	2013-Sep													160			
MANGANESE, DISSOLVED	2013-Sep										84	310	38				<5
MANGANESE	2014-Sep					470								53	270		<2.5
MANGANESE, DISSOLVED	2014-Sep						85		84		14	24	49				
MANGANESE	2015-Dec	38														<2.4	<2.4
MANGANESE, DISSOLVED	2015-Dec	54 1e															
MANGANESE	2015-Sep	2950		1030							36.9	4020	330	56.8		<2.4	<2.4
MANGANESE, DISSOLVED	2015-Sep	2570															
MANGANESE	2016-Jun	2590														4.2	<0.19
MANGANESE, DISSOLVED	2016-Jun	2530															
MANGANESE	2016-Mar	503														<0.25	<0.25
MANGANESE, DISSOLVED	2016-Mar	500															
MANGANESE	2016-Sep	2740		156							54.3		295	110		6.4	0.2
MANGANESE, DISSOLVED	2016-Sep																
MANGANESE	2017-Aug	3260		104							27.3		477	9 B		5.3 B	0.31 B
MANGANESE	2018-Aug	5540		219							24		583	3.9 M1		7.5	<0.33
MANGANESE	2019-Apr																23
MANGANESE	2019-Aug	4700	3900	340							8.2 J	2000	170	13		23	<2.5

GW Standard:
SMCL = 50

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

SELENIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
SELENIUM, DISSOLVED	1995-Aug	<5			<5	<5										
SELENIUM, DISSOLVED	1995-Oct	<5		<5	<5	<5			<5		<5	<5				
SELENIUM, DISSOLVED	1996-Apr	<5		<5	<5	<5			<5		11	<5				
SELENIUM, DISSOLVED	1996-Jan	<5		<5	<5	<5			<5			<5				
SELENIUM, DISSOLVED	1996-Jul	<5		<5	<5	<5			<5		<5	<5				
SELENIUM, DISSOLVED	1996-Oct															
SELENIUM, DISSOLVED	1997-Apr										13.3					
SELENIUM, DISSOLVED	1997-Oct										<5					
SELENIUM, DISSOLVED	1998-Apr										<5					
SELENIUM, DISSOLVED	1998-Oct						<5									
SELENIUM, DISSOLVED	1999-Sep						<5				<5					
SELENIUM, DISSOLVED	2000-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2001-Sep	<5		<5 NS+	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2002-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2003-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2004-Oct															
SELENIUM, DISSOLVED	2004-Sep	<10 R		<5	<5	<5	<5		<5			<5				
SELENIUM, DISSOLVED	2005-Sep	<5		<5 NS	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2006-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2007-Sep	<5		<5	<5	<5	<20 RL1		<5			<5				
SELENIUM, DISSOLVED	2008-Sep	<5		<5 S	<5	<5 pH>2	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2009-Sep	<5		<5	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2010-Aug	<5														
SELENIUM, DISSOLVED	2010-Sep			<5 S, S3	<5	<5	<5		<5		<5	<5				
SELENIUM, DISSOLVED	2011-Sep	<5		<5	<5	<5 S S3	<5		<5			<5				
SELENIUM, DISSOLVED	2012-Sep	<5		<5	<5	<5	<5		<5 S,S3			<5				
SELENIUM	2013-Sep															
SELENIUM, DISSOLVED	2013-Sep	1		<1	<1	<1	<1		<1		<1	<1				
SELENIUM	2014-Sep															
SELENIUM, DISSOLVED	2014-Sep	0.41		<0.14	<0.14	<0.14	0.41 J		<0.14		0.52 J					
SELENIUM	2015-Dec															
SELENIUM, DISSOLVED	2015-Dec												<5.8	<5.8	<5.8	<5.8
SELENIUM	2015-Sep															
SELENIUM, DISSOLVED	2015-Sep	<5.8		<5.8	<5.8	<5.8		<5.8		<5.8			<5.8	7.2	<5.8	<5.8
SELENIUM	2016-Jun															
SELENIUM, DISSOLVED	2016-Jun												0.95	4.8	<0.18	0.21
SELENIUM	2016-Mar															
SELENIUM, DISSOLVED	2016-Mar												<5.4	<5.4	<5.4	<5.4
SELENIUM	2016-Sep															
SELENIUM, DISSOLVED	2016-Sep	1.1		<0.37 D3	<0.37 D3	<0.37 D3		<0.18		<0.55 D3	<0.18		0.68	6.1	<0.55 D3	<0.18
SELENIUM	2017-Aug	1.1		<0.086	<0.086	0.16		<0.086		0.099	0.25		0.95	4	<0.086	0.089
SELENIUM	2018-Aug			<0.16	<0.16	<0.16		0.4		<0.16	<0.16		0.95	3.7	<0.16	<0.16
SELENIUM	2019-Apr	<1														
SELENIUM	2019-Aug		1.4 J	<1	<1	<1		<1		<1	<1		<1	qual to the M	<1	<1

GW Standard:
MCL = 50

IPL Ottumwa Midland Landfill
Historic Monitoring Results

SELENIUM
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GC5	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
SELENIUM, DISSOLVED	1995-Aug										<5						
SELENIUM, DISSOLVED	1995-Oct										<5						
SELENIUM, DISSOLVED	1996-Apr						<5		<5		26						
SELENIUM, DISSOLVED	1996-Jan																
SELENIUM, DISSOLVED	1996-Jul						<5		<5		13		<5				
SELENIUM, DISSOLVED	1996-Oct										6						
SELENIUM, DISSOLVED	1997-Apr										13						
SELENIUM, DISSOLVED	1997-Oct										10.5						
SELENIUM, DISSOLVED	1998-Apr						<5		<5		7		55				
SELENIUM, DISSOLVED	1998-Oct						<5		<5		<5		<5				
SELENIUM, DISSOLVED	1999-Sep										<5		<5				
SELENIUM, DISSOLVED	2000-Sep										<5		<5				
SELENIUM, DISSOLVED	2001-Sep						<5				<5		<5				
SELENIUM, DISSOLVED	2002-Sep										<5		<5 NS				
SELENIUM, DISSOLVED	2003-Sep										<5		<5				
SELENIUM, DISSOLVED	2004-Oct										<5						
SELENIUM, DISSOLVED	2004-Sep						<5						<5				
SELENIUM, DISSOLVED	2005-Sep										<5		<5				
SELENIUM, DISSOLVED	2006-Sep										<5		<5				
SELENIUM, DISSOLVED	2007-Sep						<5		<5		<5		<5				
SELENIUM, DISSOLVED	2008-Sep						<5		<5		5.96	<5	<5				
SELENIUM, DISSOLVED	2009-Sep						<5				<5		<5				
SELENIUM, DISSOLVED	2010-Aug																
SELENIUM, DISSOLVED	2010-Sep						<5		<5		<5	<5	<5				
SELENIUM, DISSOLVED	2011-Sep												<5				
SELENIUM, DISSOLVED	2012-Sep				<5 S S3						<5		<5				
SELENIUM	2013-Sep													39			
SELENIUM, DISSOLVED	2013-Sep										3.4	<1	<1				<1
SELENIUM	2014-Sep					3.6								13	16		<0.23
SELENIUM, DISSOLVED	2014-Sep						0.69 J		0.92 J		3.9	0.43 J	0.55 J				
SELENIUM	2015-Dec	<5.8														<5.8	<5.8
SELENIUM, DISSOLVED	2015-Dec	<5.8															
SELENIUM	2015-Sep	<5.8		<5.8							<5.8	<5.8	<5.8	9.9		<5.8	<5.8
SELENIUM, DISSOLVED	2015-Sep	<5.8															
SELENIUM	2016-Jun	1.3														1.8	<0.18
SELENIUM, DISSOLVED	2016-Jun	1.3															
SELENIUM	2016-Mar	<5.4														<5.4	<5.4
SELENIUM, DISSOLVED	2016-Mar	<5.4															
SELENIUM	2016-Sep	1.3		2.6							2.8		0.38	37.6		1.7	<0.18
SELENIUM, DISSOLVED	2016-Sep																
SELENIUM	2017-Aug	0.77		2.4							1.6		0.56	52		0.9	<0.086
SELENIUM	2018-Aug	0.85		2.1							<6.1		0.55	70.7		1.6	<0.16
SELENIUM	2019-Apr																1 J
SELENIUM	2019-Aug	<1	<1	2.1 J							1.1 J	<1	<1	52		2.3 J	<1

GW Standard:
MCL = 50

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

ZINC
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
ZINC, DISSOLVED	1995-Aug	<20			<20	<20										
ZINC, DISSOLVED	1995-Oct	<20		<20	<20	<20			<20		<20	<20				
ZINC, DISSOLVED	1996-Apr	<30		<30	<30	<30			<30		<30	<30				
ZINC, DISSOLVED	1996-Jan	<20		<20	<20	<20			<20			<20				
ZINC, DISSOLVED	1996-Jul	<30		<30	<30	<30			<30		<30	<30				
ZINC, DISSOLVED	1997-Oct										<20					
ZINC, DISSOLVED	1998-Apr															
ZINC, DISSOLVED	1998-Oct						<20									
ZINC, DISSOLVED	1999-Sep						32									
ZINC, DISSOLVED	2000-Sep						<20									
ZINC, DISSOLVED	2001-Sep						<20									
ZINC, DISSOLVED	2002-Sep						<20									
ZINC, DISSOLVED	2003-Sep						<20									
ZINC, DISSOLVED	2004-Oct															
ZINC, DISSOLVED	2004-Sep	<20		<40 IE	<40 IE	<40 IE	<20		<40 IE			<20				
ZINC, DISSOLVED	2005-Sep	29		<100 IE	<100 IE	<100 IE	87		<100 IE		41	<100 IE				
ZINC, DISSOLVED	2006-Sep	25.4		<60	118	<60 IE	29.1		<60 IE		45.1	<60 IE				
ZINC, DISSOLVED	2007-Sep	29.1		<100 IE,MI	<100 IE	<100 IE	183		<40 IE			<40 IE				
ZINC, DISSOLVED	2008-Sep	22.2		<100 IE	<100 IE	<100 IEpH>	91.3		<100 IE		28.3	<100 IE				
ZINC, DISSOLVED	2009-Sep	45.5		<60 IE	<60 IE	<60 IE	183		<60 IE		25.4	<60 IE				
ZINC, DISSOLVED	2010-Aug	<20														
ZINC, DISSOLVED	2010-Sep			<60 IE	<60 IE	<60 IE	<20		<60 IE		<20	<20				
ZINC, DISSOLVED	2011-Sep	<20		<100 IE	<100 IE	<100 IE	<20		<60 IE			<60 IE				
ZINC, DISSOLVED	2012-Sep	<20		<60 IE	<60 IE	<60 IE	<20		133			<60 IE				
ZINC	2013-Sep															
ZINC, DISSOLVED	2013-Sep	<50		<50	<50	<50	<50		<50		100	<50				
ZINC	2014-Sep															
ZINC, DISSOLVED	2014-Sep	22		<12	15	<12	<12		<12		28					
ZINC	2015-Dec															
ZINC, DISSOLVED	2015-Dec												2.8	<2.6	11	35
ZINC	2015-Sep															
ZINC, DISSOLVED	2015-Sep	<2.6		<2.6	5.9	3.3		<2.6		4.1			<2.6	<2.6	5.9	7.6
ZINC	2016-Jun															
ZINC, DISSOLVED	2016-Jun												3.3 B	4.1 B	14.6 B	22.7
ZINC	2016-Mar															
ZINC, DISSOLVED	2016-Mar												<7.1	<7.1	<7.1	<7.1
ZINC	2016-Sep															
ZINC, DISSOLVED	2016-Sep	3.7 B		2.7 B	4.2 B	2.8 B		3.2 B		3.2 B	11.6		6.2 B	3.9 B	28.5 B	6.3 B
ZINC	2017-Aug	2.4		3.7	2 B	1.7 B		1.5 B		1 B	10.4		0.88	1.8	3.6 M1	87.8
ZINC	2018-Aug			<3.7	<3.7	<3.7		6		<3.7	31.4		<3.7	6.7	4.3	88.1
ZINC	2019-Apr	<10														
ZINC	2019-Aug		<10	<10	<10	<10	ter than or equal to the MDL and the			<10	<10		<10	<10	<10	86

GW Standard:
SMCL = 5000

IPL Ottumwa Midland Landfill
Historic Monitoring Results

ZINC
UNITS: UG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
ZINC, DISSOLVED	1995-Aug										<20						
ZINC, DISSOLVED	1995-Oct										<20						
ZINC, DISSOLVED	1996-Apr						<30		<30		<30						
ZINC, DISSOLVED	1996-Jan																
ZINC, DISSOLVED	1996-Jul						<30		33		<30						
ZINC, DISSOLVED	1997-Oct																
ZINC, DISSOLVED	1998-Apr						<20		<20				<20				
ZINC, DISSOLVED	1998-Oct						<20		<20				<20				
ZINC, DISSOLVED	1999-Sep												<20				
ZINC, DISSOLVED	2000-Sep												<20				
ZINC, DISSOLVED	2001-Sep												<20				
ZINC, DISSOLVED	2002-Sep																
ZINC, DISSOLVED	2003-Sep																
ZINC, DISSOLVED	2004-Oct										<20						
ZINC, DISSOLVED	2004-Sep						<20						<20				
ZINC, DISSOLVED	2005-Sep										24		<20				
ZINC, DISSOLVED	2006-Sep										25.5		23.7				
ZINC, DISSOLVED	2007-Sep						33.2		62.6		26.7		31.1				
ZINC, DISSOLVED	2008-Sep						<20		<20		<20	35.7	<20				
ZINC, DISSOLVED	2009-Sep						38.9				21.9		25.5				
ZINC, DISSOLVED	2010-Aug																
ZINC, DISSOLVED	2010-Sep						<20		<20		<20	34.3	<20				
ZINC, DISSOLVED	2011-Sep												<20				
ZINC, DISSOLVED	2012-Sep				37.8						<20		<20				
ZINC	2013-Sep													<50			
ZINC, DISSOLVED	2013-Sep										<50	<50	<50				<50
ZINC	2014-Sep					27								<12	<12		<12
ZINC, DISSOLVED	2014-Sep						<12		<12		<12	<12	<12				
ZINC	2015-Dec	4.9														<2.6	4.7
ZINC, DISSOLVED	2015-Dec	7.1															
ZINC	2015-Sep	21.8		21.9							6.2	14.7	6.5	4.6		3.1	<2.6
ZINC, DISSOLVED	2015-Sep	22.5															
ZINC	2016-Jun	23.8														1.7	1.5
ZINC, DISSOLVED	2016-Jun	25.6 D9															
ZINC	2016-Mar	<7.1														<7.1	<7.1
ZINC, DISSOLVED	2016-Mar	<7.1															
ZINC	2016-Sep	17.2		15.9							2.9		2.6	2		10.1	4.1
ZINC, DISSOLVED	2016-Sep																
ZINC	2017-Aug	26.2		14.5							1.4 B		2.5 B	1.8 B		1.2 B	2 B
ZINC	2018-Aug	166		23.6							<3.5		<3.7	<3.7		<3.7	<3.7
ZINC	2019-Apr																<10
ZINC	2019-Aug	36	91	15 J							<10	<10	<10	<10		<10	<10

GW Standard:
SMCL = 5000

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

CHLORIDE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
CHLORIDE	1995-Aug	170			14	13										
CHLORIDE	1995-Oct	150		48	<5	<5			16		66	<5				
CHLORIDE	1996-Apr	121		48	17	18			16		19	22				
CHLORIDE	1996-Jan	174		54	32	35			21			20				
CHLORIDE	1996-Jul	138.3		46.6	17.5	18.1			16.2		9.9	21.7				
CHLORIDE	1996-Oct	106		53	27	25			26		21	31				
CHLORIDE	1997-Apr	98		49	19	19			18		9.5	22				
CHLORIDE	1997-Oct	120		50	18	19			18		8.9	23				
CHLORIDE	1998-Apr	120		51	19	23			19		6	24				
CHLORIDE	1998-Oct	580		50	18	20	8.6		18			22				
CHLORIDE	1999-Sep	110		49	17	22			20		5.6	24				
CHLORIDE	2000-Sep	89.6		52.1	16.8	24.4	7.4		20.2		<5	22.1				
CHLORIDE	2001-Sep	53.3		59.7	15.6	21	8.7		18.6		5.6	19.7				
CHLORIDE	2002-Sep	59.5		76.9	14.3	25	7.6		19.3		<5	22.9				
CHLORIDE	2003-Sep	64.8		71.8	13.6	21.6	7.5		18.3		5.6	20.4				
CHLORIDE	2004-Oct															
CHLORIDE	2004-Sep	37.9		63.9	13.5	21.7	7.7		18.9			18.5				
CHLORIDE	2005-Sep	60		55	13.4	21.6	6.9		18.8		5.8	20.2				
CHLORIDE	2006-Sep	35.9		55.3	14.1	22.6	7.08		19		5.88	20.5				
CHLORIDE	2007-Sep	34.5		53.5	13.6	22	7.49		17.9			17.2				
CHLORIDE	2008-Sep	70.4		56.9	13	20.5	6.51		17.8		5.51	16.2				
CHLORIDE	2009-Sep	84.9		53.2	14.2	21.6	6.92		17.9		<5	16.3				
CHLORIDE	2010-Aug	164														
CHLORIDE	2010-Sep			49.2	11.5	19.5	<10 RL1		17		4.73	16.5				
CHLORIDE	2011-Sep	113		51	13.1	21.8	5.98		17			16.5				
CHLORIDE	2012-Sep	74.4			12.7	22.4	<5 RL1		18.1			17.1				
CHLORIDE	2013-Sep	54.7		46.1	11.5	18.9	3.9		16.4		3.2	14.8				
CHLORIDE	2014-Sep	26.6		47.8	11.5	20.9	4		18.9		2.8					
CHLORIDE	2015-Dec												21.1	4.3	8.6	1.9
CHLORIDE	2015-Sep	62.4		47.7	11.2	19.4		10.9		28.5			26.5	3.8	8.6	2.3
CHLORIDE	2016-Jun												24.8	4.7	8.5	1.8
CHLORIDE	2016-Mar												22.7	4.6	9.3	1.9
CHLORIDE	2016-Sep	64.9		44.5	12.1	19.3		7.4		19.2	6.7		27.4	4.3	8.8	2
CHLORIDE	2017-Aug	60.6		47.4	11.5	17.7		5.6		20.7	7		26.4	5.3	8.6	2.1
CHLORIDE	2018-Aug			47.2	11.9	18.9		5.5		20.4	8		26.4	5.3	8.8	2.1
CHLORIDE	2019-Apr	24														
CHLORIDE	2019-Aug		25	50	13	18		6.3		22	qual to the MDL and the		27	6.7	9.1	2.7 J

GW Standard:
SMCL = 250

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

CHLORIDE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
CHLORIDE	1995-Aug										30						
CHLORIDE	1995-Oct										36						
CHLORIDE	1996-Apr						20		20		17						
CHLORIDE	1996-Jan																
CHLORIDE	1996-Jul						30.4		7.5		9		35.6				
CHLORIDE	1996-Oct										18		106				
CHLORIDE	1997-Apr						56		23		12						
CHLORIDE	1997-Oct										8.1						
CHLORIDE	1998-Apr						13		14		5.8		6.4				
CHLORIDE	1998-Oct						8.8		10		<5		<5				
CHLORIDE	1999-Sep										4.3		6.2				
CHLORIDE	2000-Sep										<5		<5				
CHLORIDE	2001-Sep						23.4				5.4		5.5				
CHLORIDE	2002-Sep										<5		<5				
CHLORIDE	2003-Sep										7		33.1				
CHLORIDE	2004-Oct										<5 MSO						
CHLORIDE	2004-Sep						18.5						<5				
CHLORIDE	2005-Sep										5.2		16.2				
CHLORIDE	2006-Sep										6.18		13.7				
CHLORIDE	2007-Sep						23.1		16.8		6.3		8.33				
CHLORIDE	2008-Sep						20.7		18.6		<5	10.2	9.39				
CHLORIDE	2009-Sep						17.2				<5		5.19				
CHLORIDE	2010-Aug																
CHLORIDE	2010-Sep						16.2		9.25		3.31	6.24	5.07				
CHLORIDE	2011-Sep												16.1				
CHLORIDE	2012-Sep				16.5						10.1		30.6				
CHLORIDE	2013-Sep										2.8	6.3	6.4	123			<1
CHLORIDE	2014-Sep					15.4	8.4		6.3		2.7	3.6	4.9	29.7	31.6		<0.5
CHLORIDE	2015-Dec	17.5														5	<0.5
CHLORIDE	2015-Sep	17.5		5.8							5.3	19.6	8.5	24		10.2	<0.5
CHLORIDE	2016-Jun	16														5.8	<0.5
CHLORIDE	2016-Mar	18.8														4.9	<0.5
CHLORIDE	2016-Sep	17.2		19.4							9.2		14.1	127		5.6	<0.5
CHLORIDE	2017-Aug	16.7		14.8							7		32.9	138		8.5	0.67
CHLORIDE	2018-Aug	12.8		16.4							11		38.8	147		8.1	<0.46
CHLORIDE	2019-Apr																25
CHLORIDE	2019-Aug	18	19	10							3.7 J	16	8.1	180		18	<0.29

GW Standard:
SMCL = 250

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

SULFATE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-07P	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
SULFATE	1999-Sep	350			440	640	510			550		390	440				
SULFATE	2000-Sep	340			740	840	610	2400		680		370	530				
SULFATE	2001-Sep	210 SA			880 SA	1100 SA	540 SA	1700 SA		570 SA		430 SA	450 SA				
SULFATE	2002-Sep	320 SA			710 SA	1000 SA	660 SA	2200 SA		690 SA		600 SA	600 SA				
SULFATE	2003-Sep	260 SA			760 SA	1000 SA	640 SA	1700 SA		820 SA		1300 SA	490 SA				
SULFATE	2004-Oct																
SULFATE	2004-Sep	160 SA			770 SA	920 SA	630 SA	2300 SA		850 SA			530 SA				
SULFATE	2005-Sep	260			840	1000	740	2100		810		900	590				
SULFATE	2006-Sep	157			930	645	970	3440		960		542	656				
SULFATE	2007-Sep	138			814	1040	694	1910		784			552				
SULFATE	2008-Sep	291			724	929	657	1850		716		561	493				
SULFATE	2009-Sep	298		845	726	921	638	1820		688		296	476				
SULFATE	2010-Aug	403															
SULFATE	2010-Sep			293	713	942	648	1820		697		381	481				
SULFATE	2011-Sep	374			733	1070	602	1830		642			431				
SULFATE	2012-Sep	318		705	752	961	692	762		734			507				
SULFATE	2013-Sep	264			680	966	646	707		783		1110	507				
SULFATE	2014-Sep	97.8			747	922	728	607		719		568					
SULFATE	2015-Dec													151	1020	2070	192
SULFATE	2015-Sep	312			759	982	667		1280		1170			154	931	1690	193
SULFATE	2016-Jun													153	942	1840	179
SULFATE	2016-Mar													146	922	1860	173
SULFATE	2016-Sep	323			821	1150	764 M1		1020		1470	881		170	883	1920	175
SULFATE	2017-Aug	346			710	1240	628		874		850	1060		176	607	1540	140
SULFATE	2018-Aug				782	1210	684		990		786	1360		169	526	1690	155
SULFATE	2019-Apr	190															
SULFATE	2019-Aug		60		810	1200	710		980		800	260		160	440	1600	99

GW Standard:
SMCL = 250

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

SULFATE
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERD RAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2
SULFATE	1999-Sep										460		390			
SULFATE	2000-Sep										300		310			
SULFATE	2001-Sep						40 SA				330 SA		380 SA			
SULFATE	2002-Sep										460 SA		310 SA			
SULFATE	2003-Sep										880 SA		380 SA			
SULFATE	2004-Oct										390					
SULFATE	2004-Sep						20 SA						390 SA			
SULFATE	2005-Sep										610		400			
SULFATE	2006-Sep										644		428			
SULFATE	2007-Sep						36		328		403		283			
SULFATE	2008-Sep						23.4		35.6		457	21.8	463			
SULFATE	2009-Sep						30.6				289		447			
SULFATE	2010-Aug															
SULFATE	2010-Sep						30.8		37.6		221	45.1	104			
SULFATE	2011-Sep												489			
SULFATE	2012-Sep				948						901		598			
SULFATE	2013-Sep										380	36.3	276	4060		
SULFATE	2014-Sep					1170	14.1		17.1		298	10.3	175	1390	1360	
SULFATE	2015-Dec	249														242
SULFATE	2015-Sep	432		691							576	162	527	1060		287
SULFATE	2016-Jun	622														223
SULFATE	2016-Mar	241														229
SULFATE	2016-Sep	514		905							688		356	5000		240
SULFATE	2017-Aug	561		771							631		362	5290		411
SULFATE	2018-Aug	959		962							624		363	5920		549
SULFATE	2019-Apr															
SULFATE	2019-Aug	350	450	520							260	5.6	180	1800		750

GW Standard:
SMCL = 250

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

TOTAL DISSOLVED SOLIDS
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-12	MW-13	MW-14	MW-15R	MW-16R	MW-17	MW-100R	MW-101R	MW-102P	MW-108
TOTAL DISSOLVED SOLIDS	2015-Sep	929		1930	1940	2000	2480	2830		637	1900	3560	520
TOTAL DISSOLVED SOLIDS	2015-Dec									589	1880	3140	484
TOTAL DISSOLVED SOLIDS	2016-Mar									606	1760	3380	490
TOTAL DISSOLVED SOLIDS	2016-Jun									622	1780	2990	476
TOTAL DISSOLVED SOLIDS	2016-Sep	808		1560	2100	1850	2050	2830	1440	601	1510	2890	432
TOTAL DISSOLVED SOLIDS	2017-Aug	887		1700	2170	1820	2050	2340	1560	633	1290	2760	420
TOTAL DISSOLVED SOLIDS	2018-Aug			1860	2430	2090	2030	2320	2160	644	1160	2730	448
TOTAL DISSOLVED SOLIDS	2019-Apr	640											
TOTAL DISSOLVED SOLIDS	2019-Aug		530	1800	2400	2000	2300	2300	600	630	1100	3100	430

GW Standard:
SMCL = 500 mg/L

IPL Ottumwa Midland Landfill
Historic Monitoring Results

TOTAL DISSOLVED SOLIDS
UNITS: MG/L

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2	FIELD BLANK
TOTAL DISSOLVED SOLIDS	2015-Sep	1150		1170							939	558	927	1750		471	<5
TOTAL DISSOLVED SOLIDS	2015-Dec	792														423	10
TOTAL DISSOLVED SOLIDS	2016-Mar	828														383	16
TOTAL DISSOLVED SOLIDS	2016-Jun	1420														391	7
TOTAL DISSOLVED SOLIDS	2016-Sep	1110		1550							964		544	6730		334	<5
TOTAL DISSOLVED SOLIDS	2017-Aug	1270		1480							973		682	8340		611	<5
TOTAL DISSOLVED SOLIDS	2018-Aug	1710		1630							937		725	8850		791	10 H1
TOTAL DISSOLVED SOLIDS	2019-Apr																370
TOTAL DISSOLVED SOLIDS	2019-Aug	1100	1200	970							460	320	720	3100		1200	24 J

GW Standard:
SMCL = 500 mg/L

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

PH, LAB
UNITS: STD. UNITS

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-07M	MW-07P	MW-08	MW-09M	MW-09P	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
PH, LAB	2018-Aug																				
PH, FIELD	1995-Aug	7.15								7.03	7.17										
PH, FIELD	1995-Oct	6.95							6.43	6.9	6.96			6.67		6.94	7.29				
PH, FIELD	1996-Jan	7.88							8.28	8.18	7.47			7.94			7.83				
PH, FIELD	1996-Apr	7.5							8	7.3	7.4			7.7		7.2	7.1				
PH, FIELD	1996-Jul	7.3							8.1	7.2	7.5			7.8		7.4	7.3				
PH, FIELD	1996-Oct	7							8.1	6.9	7.1			7.5		6.8	7.2				
PH, FIELD	1997-Apr	7.4							8	7.2	7.4			7.4		7.4	7.3				
PH, FIELD	1997-Oct	7.4							8.2	7.3	7.5			7.7		7.5	7.3				
PH, FIELD	1998-Apr	6.82							7.47	6.79	7.09			7.11		6.9	7.07				
PH, FIELD	1998-Oct	6.7							7.4	7	6.7	6.4		7			6.5				
PH, FIELD	1999-Sep	7.1							7.6	6.8	6.7	6.4		7.2		6.9	6.9				
PH, FIELD	2000-Sep	7.11							7.87	7.13	7.47	6.53		7.4		7.03	7.03				
PH, FIELD	2001-Sep	7.33							7.82	7.07	7.23	6.67		7.4		7.04	7.04				
PH, FIELD	2002-Sep	7.15							7.5	7.03	7.12	6.83		7.16		7.35	6.98				
PH, FIELD	2003-Sep	7.33							7.31	7	7.3	5.83		6.97		7.06	7.29				
PH, FIELD	2004-Sep	7.23							7.68	7.11	7.4	6.48		7.25			7.1				
PH, FIELD	2004-Oct																				
PH, FIELD	2005-Sep	6.59							7.65	6.89	7.06	6.4		6.82		6.91	6.94				
PH, FIELD	2006-Sep	7.61							7.8	6.67	7.06	6.63		6.8		6.73	7.35				
PH, FIELD	2007-Sep	6.08							7.44	6.58	7.03			6.53			6.43				
PH, FIELD	2008-Sep	6.98							7.65	6.71	7.09	6.8		7.4		7.46	7.07				
PH, FIELD	2009-Sep	7			6.82				7.54	6.85	7.02	6.41		6.75		6.77	6.9				
PH, FIELD	2010-Aug	7.24																			
PH, FIELD	2010-Sep				6.79				7.71	7.16	7.15	6.76		7.31		7.19	7.26				
PH, FIELD	2011-Sep	8.5							8.09	7.57	7.73	6.84		7.24			7.55				
PH, FIELD	2012-Sep	8.23			7.53				6.72	6.94	7.23	5.47		7.41			7.27				
PH, FIELD	2013-Sep																				
PH, FIELD	2013-Sep	7.44		7.45		7.12			7.75	7.32	7.48	7		7.53		7	7.46				
PH, FIELD	2014-Sep	7.56			7.94	6.85	7.08	5.35	8.15	7.23	7.37	6.65		7.36		7.2					
PH, FIELD	2015-Sep	7.38							7.9	7.16	7.28		6.74		6.95				7.07	6.55	
PH, FIELD	2015-Dec																	6.78	6.84	6.12	6.87
PH, FIELD	2016-Mar																	7.27	6.93	6.5	7.09
PH, FIELD	2016-Jun																	7.17	7.29	7.01	7.25
PH, FIELD	2016-Sep	7.76							7.91	7.63	7.14		7.05		7.11	6.97		7.83	7.19	6.38	7.09
PH, FIELD	2017-Aug	7.27							7.7	6.97	7.18		6.44		6.84	6.87		7.07	6.73	6.26	6.62
PH, FIELD	2018-Aug								8.18	7.33	7.45		6.8		7.2	6.89		7.47	7.22	6.63	6.95
PH, FIELD	2019-Apr	7.36																			
PH, FIELD	2019-Aug		7.65						7.61	6.98	7.04		6.41		6.74	7.15		7.28	7.33	6.39	6.37

GW Standard:
SMCL = 8.5

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

PH, LAB
UNITS: STD. UNITS

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2
PH, LAB	2018-Aug															8.4 H6
PH, FIELD	1995-Aug										9.13					
PH, FIELD	1995-Oct										6.05					
PH, FIELD	1996-Jan															
PH, FIELD	1996-Apr						8.2		8		8.8					
PH, FIELD	1996-Jul						8.3		7.1		8.5		9			
PH, FIELD	1996-Oct										8.1		8.1			
PH, FIELD	1997-Apr						7.8		8.2		8.8					
PH, FIELD	1997-Oct										8.7					
PH, FIELD	1998-Apr						7.96		8.19		7.41		7.48			
PH, FIELD	1998-Oct						7.1		7.4		6.9		7.1			
PH, FIELD	1999-Sep										8.1		8.1			
PH, FIELD	2000-Sep										7.7		7.67			
PH, FIELD	2001-Sep						7.6				7.31		7.47			
PH, FIELD	2002-Sep										8.34		7.5			
PH, FIELD	2003-Sep										8.02		7.2			
PH, FIELD	2004-Sep						8.15						7.87			
PH, FIELD	2004-Oct										6.8					
PH, FIELD	2005-Sep										7.97		7.72			
PH, FIELD	2006-Sep										7.53		7.59			
PH, FIELD	2007-Sep						7.88		7.36		7.68		8.05			
PH, FIELD	2008-Sep						7.7		7.84		8.34	7.92	7.66			
PH, FIELD	2009-Sep						7.82				7.02		8.48			
PH, FIELD	2010-Aug															
PH, FIELD	2010-Sep						7.37		8.4		8.1	7.9	8.11			
PH, FIELD	2011-Sep												9.11			
PH, FIELD	2012-Sep										8.62		8.55			
PH, FIELD	2013-Sep													7.56		
PH, FIELD	2013-Sep										8.01	7.48	7.49			
PH, FIELD	2014-Sep					6.89	7.59		8.02		7.81	7.68	8.09	7.68	6.98	
PH, FIELD	2015-Sep	6.85		6.91					7.81		8.23	7.57	7.54	7.39		
PH, FIELD	2015-Dec	6.94														7.28
PH, FIELD	2016-Mar	6.43														8.48
PH, FIELD	2016-Jun	7.09														7.92
PH, FIELD	2016-Sep	8.1		6.8							7.61		8.23	7.13		8.89
PH, FIELD	2017-Aug	7.13		7.09							8.32		8.33	6.71		7.8
PH, FIELD	2018-Aug	6.94		7.15							7.5		7.99	8.1		8.81
PH, FIELD	2019-Apr															
PH, FIELD	2019-Aug			7.94							8.03	7.59	7.64	8.43		9.22

GW Standard:
SMCL = 8.5

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

TEMPERATURE
UNITS: DEG C

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-07M	MW-07P	MW-08	MW-09M	MW-09P	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
TEMPERATURE	1995-Aug	27.8								20.9	21.1										
TEMPERATURE	1995-Oct	11.3							8.5	8.6	8.6			10.4		13.7	8.8				
TEMPERATURE	1996-Jan	6.47							6.1	6.31	6.9			5.36			5				
TEMPERATURE	1996-Apr	8.5							11.5	9.5	10.5			11.7		6	9				
TEMPERATURE	1996-Jul	17							16	18.7	14			20.5		20.1	13.5				
TEMPERATURE	1996-Oct	14.4							12.8	12.2	12.8			12.2		14.4	11.7				
TEMPERATURE	1997-Apr	10							13	13	13			13		9	12				
TEMPERATURE	1997-Oct	17							15	14	13			15		20	14				
TEMPERATURE	1998-Apr	12							13	12	9			9		13.5	13.5				
TEMPERATURE	1998-Oct	14.4							12.5	15	13.2	12		12.6			12.5				
TEMPERATURE	1999-Sep	14							12.5	14.1	12	13		12.5		14.5	12.4				
TEMPERATURE	2000-Sep	21.5							16.1	15.1	16.7	16.8		12.8		22.7	12.9				
TEMPERATURE	2001-Sep	16.7							16.1	15.1	14.2	16.8		14.2		19.2	12.9				
TEMPERATURE	2002-Sep	17.2							24.1	17.6	16.5	15.2		16.1		21.1	19.4				
TEMPERATURE	2003-Sep	17.1							15.9	15.4	23.2	13.4		16.7		22.3	15.9				
TEMPERATURE	2004-Sep	16.8							15.9	16.7	16.1	15.8		17.5			15.8				
TEMPERATURE	2004-Oct																				
TEMPERATURE	2005-Sep	15.3							13.3	15.2	15.1	15.8		14.5		21.4	14.6				
TEMPERATURE	2006-Sep	17.4							18	16.6	19.2	16.3		17.2		21.5	14.5				
TEMPERATURE	2007-Sep	15.1							13.8	14.6	14.3			13			12.7				
TEMPERATURE	2008-Sep	18							17.1	14.8	14.8	21.1		16		25.4	15				
TEMPERATURE	2009-Sep	15.4			14				13.9	16.4	15.8	15.1		17.1		21.3	16.4				
TEMPERATURE	2010-Aug	17.6																			
TEMPERATURE	2010-Sep				16.8				16.6	15.8	16.1	18		15.9		21.4	15.2				
TEMPERATURE	2011-Sep	18.1							12.6	15.5	15.8	12.3		12.8			12.4				
TEMPERATURE	2012-Sep	16.8			15.1				15.2	12.5	11.8	10.5		14.3							
TEMPERATURE	2013-Sep	16.5		15.9		14.7			14.7	15.5	16.3	14.7		17.3		22.3	15.6				
TEMPERATURE	2014-Sep	17.6			13.1	14.3	16.3	14.5	15.8	14.6	15.3	13.5		14.4		24.5					
TEMPERATURE	2015-Sep	17							14.5	13.6	14		14.1		13.9				12.5	13.2	
TEMPERATURE	2015-Dec																	12.7	12.4	13.8	12.1
TEMPERATURE	2016-Mar																	11.5	12.2	13.8	12.8
TEMPERATURE	2016-Jun																	11.3	12	14.8	13.1
TEMPERATURE	2016-Sep	15.8							13.9	13.9	13.6		12.9		13.8	21		12.7	12.6	14.5	12.8
TEMPERATURE	2017-Aug	19.5							15.2	14.2	16.3		17.7		14.3	19.8		13.6	15	13.3	13.2
TEMPERATURE	2018-Aug								13.9	14.6	13.7		16.6		14	19.2		13.2	12.3	14.1	13.9
TEMPERATURE	2019-Apr	8.87																			
TEMPERATURE	2019-Aug		13.8						15.6	14.3	15.5		16.7		15	25.9		12.7	11.8	13.5	13.7

GW Standard:
None

IPL Ottumwa Midland Landfill
Historic Monitoring Results

TEMPERATURE
UNITS: DEG C

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	Leachate Basin	LEACHATE LIFT STATION	TCB-1/2
TEMPERATURE	1995-Aug										35.5					
TEMPERATURE	1995-Oct										11.4					
TEMPERATURE	1996-Jan										8.6					
TEMPERATURE	1996-Apr						13		12.2		9					
TEMPERATURE	1996-Jul						24.5		29.5		28.3		36			
TEMPERATURE	1996-Oct										12.2		13.3			
TEMPERATURE	1997-Apr						9		9		17					
TEMPERATURE	1997-Oct										23					
TEMPERATURE	1998-Apr						18.5		18.5		17		17			
TEMPERATURE	1998-Oct						14		13.2		15.5		15.5			
TEMPERATURE	1999-Sep										18		19			
TEMPERATURE	2000-Sep										17.5		22.5			
TEMPERATURE	2001-Sep						16.8				17.9		17.9			
TEMPERATURE	2002-Sep										26		25.1			
TEMPERATURE	2003-Sep										23.2		21.5			
TEMPERATURE	2004-Sep						21.4						23.5			
TEMPERATURE	2004-Oct										13.8					
TEMPERATURE	2005-Sep										22.2		19.7			
TEMPERATURE	2006-Sep										20.7		21.9			
TEMPERATURE	2007-Sep						16.5		15		22.4		22.1			
TEMPERATURE	2008-Sep						20.9		21.4		21.8	19.4	19.2			
TEMPERATURE	2009-Sep						19.5				21.9		23.6			
TEMPERATURE	2010-Aug															
TEMPERATURE	2010-Sep						25.1		22.5		24.6	23.8	26.9			
TEMPERATURE	2011-Sep						12.4						24.1			
TEMPERATURE	2012-Sep				16.33						18.44		21.13			
TEMPERATURE	2013-Sep										24.2	24.6	19.9	21.2		
TEMPERATURE	2014-Sep					18.1	20.3		21.7		23.1	20.8	22.5	21.6	18.7	
TEMPERATURE	2015-Sep	16.8		22					21		25.6	21.7	25.1	23.1		
TEMPERATURE	2015-Dec	9.8														1
TEMPERATURE	2016-Mar	11														10.5
TEMPERATURE	2016-Jun	15.6														29
TEMPERATURE	2016-Sep	17.2		15							26.9		27	18		27.2
TEMPERATURE	2017-Aug	18.5		15.4							23.4		21.7	18		22.8
TEMPERATURE	2018-Aug	19.9		13.8							24.7		25.3	22		28
TEMPERATURE	2019-Apr															
TEMPERATURE	2019-Aug										27.8	21.8	25.4	23.8		25.2

GW Standard:
None

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

IPL Ottumwa Midland Landfill
Historic Monitoring Results

CONDUCTANCE, SPECIFIC
UNITS: UMHOS/CM

CHEMICAL PARAMETER	EVENT	MW-01	MW-01R	MW-07M	MW-07P	MW-08	MW-09M	MW-09P	MW-12	MW-13	MW-14	MW-15	MW-15R	MW-16	MW-16R	MW-17	MW-18	MW-100R	MW-101R	MW-102P	MW-108
CONDUCTANCE, SPECIFIC	1995-Aug	1510								3990	2660										
CONDUCTANCE, SPECIFIC	1995-Oct	2180							4140	6460	4320			3200		4920	4880				
CONDUCTANCE, SPECIFIC	1996-Jan	1950							2880	4290	3040			2380			2160				
CONDUCTANCE, SPECIFIC	1996-Apr	1540							2700	3900	2800			2000		2300	2500				
CONDUCTANCE, SPECIFIC	1996-Jul	1340							2000	3200	2000			1700		1240	2000				
CONDUCTANCE, SPECIFIC	1996-Oct	1770							2600	3500	2600			2000		1490	2500				
CONDUCTANCE, SPECIFIC	1997-Apr	1570							2600	3200	2400			2100		1700	2400				
CONDUCTANCE, SPECIFIC	1997-Oct	1790							2400	2900	2600			2000		1940	2300				
CONDUCTANCE, SPECIFIC	1998-Apr	1460							2460	2860	2590			2090		1280	2370				
CONDUCTANCE, SPECIFIC	1998-Oct	1440							2370	2780	2390	2790		1900			2300				
CONDUCTANCE, SPECIFIC	1999-Sep	1520							2370	2840	2660	3180		2100		1630	2570				
CONDUCTANCE, SPECIFIC	2000-Sep	1374							2700	3030	2850	3530		2420		1042	2390				
CONDUCTANCE, SPECIFIC	2001-Sep	1015							2610	2970	2860	2610		2280		1366	2150				
CONDUCTANCE, SPECIFIC	2002-Sep	1179							2650	2990	3030	3490		2490		1564	2540				
CONDUCTANCE, SPECIFIC	2003-Sep	993							2310	2570	2970	3160		2070		2410	2380				
CONDUCTANCE, SPECIFIC	2004-Sep	830							1168	2610	3050	3470		2460			2100				
CONDUCTANCE, SPECIFIC	2004-Oct																				
CONDUCTANCE, SPECIFIC	2005-Sep	1531							2650	2850	2900	3480		2210		2050	2340				
CONDUCTANCE, SPECIFIC	2006-Sep	827							2540	2560	2600	3510		2380		2620	2340				
CONDUCTANCE, SPECIFIC	2007-Sep	834							2590	2580	2970			2290			2020				
CONDUCTANCE, SPECIFIC	2008-Sep	1297							2640	2910	3050	3520		2510		1353	1971				
CONDUCTANCE, SPECIFIC	2009-Sep	1340			2320				2740	2960	3020	3510		2300		830	1935				
CONDUCTANCE, SPECIFIC	2010-Aug	1618																			
CONDUCTANCE, SPECIFIC	2010-Sep				1409				2680	2840	3020	3380		2230		1103	1896				
CONDUCTANCE, SPECIFIC	2011-Sep	1507							2690	2520	2540	3780		2350			1917				
CONDUCTANCE, SPECIFIC	2012-Sep	1332			2117				2696	2813	3063	2372		2260			2045				
CONDUCTANCE, SPECIFIC	2013-Sep	923		2970		1893			2580	2680	2810	1657		1879		1411	1495				
CONDUCTANCE, SPECIFIC	2014-Sep	470			2520	2890	7440	7420	2890	3050	3240	1259		2600		1204					
CONDUCTANCE, SPECIFIC	2015-Sep	1139							2790	2830	3040		2530		3460				1804	3450	
CONDUCTANCE, SPECIFIC	2015-Dec																	880	2310	4480	739
CONDUCTANCE, SPECIFIC	2016-Mar																	815	1775	3860	652
CONDUCTANCE, SPECIFIC	2016-Jun																	865	1952	3602	715.9
CONDUCTANCE, SPECIFIC	2016-Sep	1263							2920	3330	3240		2590		4290	1677		933	1874	3980	714
CONDUCTANCE, SPECIFIC	2017-Aug	1663							3380	4121	3734		3360		4198	2482		1221	2087	4362	857
CONDUCTANCE, SPECIFIC	2018-Aug								2617	3149	2778		2633		3155	2394		907	1438	3291	673
CONDUCTANCE, SPECIFIC	2019-Apr	951																			
CONDUCTANCE, SPECIFIC	2019-Aug		791						2577	3103	2741		2640		3152	806		927	1425	3558	517

GW Standard:
None

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IPL Ottumwa Midland Landfill
Historic Monitoring Results

CONDUCTANCE, SPECIFIC
UNITS: UMHOS/CM

CHEMICAL PARAMETER	EVENT	GU-1 TEMP	GU-2	GU-EX	GW GCS	UNDERDRAIN LIFT STATION	SW-1	SW-1R	SW-2	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	LEACHATE LIFT STATION	TCB-1/2
CONDUCTANCE, SPECIFIC	1995-Aug										900					
CONDUCTANCE, SPECIFIC	1995-Oct										1350					
CONDUCTANCE, SPECIFIC	1996-Jan															
CONDUCTANCE, SPECIFIC	1996-Apr						650		1180		880					
CONDUCTANCE, SPECIFIC	1996-Jul						650		1170		620		950			
CONDUCTANCE, SPECIFIC	1996-Oct										750		1480			
CONDUCTANCE, SPECIFIC	1997-Apr						680		730		1110					
CONDUCTANCE, SPECIFIC	1997-Oct										1150					
CONDUCTANCE, SPECIFIC	1998-Apr						410		440		890		1000			
CONDUCTANCE, SPECIFIC	1998-Oct						320		370		510		730			
CONDUCTANCE, SPECIFIC	1999-Sep										980		900			
CONDUCTANCE, SPECIFIC	2000-Sep										782		901			
CONDUCTANCE, SPECIFIC	2001-Sep						783				904		911			
CONDUCTANCE, SPECIFIC	2002-Sep										978		922			
CONDUCTANCE, SPECIFIC	2003-Sep										1550		1126			
CONDUCTANCE, SPECIFIC	2004-Sep						721						959			
CONDUCTANCE, SPECIFIC	2004-Oct										896					
CONDUCTANCE, SPECIFIC	2005-Sep										1220		997			
CONDUCTANCE, SPECIFIC	2006-Sep										1335		1168			
CONDUCTANCE, SPECIFIC	2007-Sep						704		891		1000		841			
CONDUCTANCE, SPECIFIC	2008-Sep						536		549		1027	363	1180			
CONDUCTANCE, SPECIFIC	2009-Sep						678				738		1063			
CONDUCTANCE, SPECIFIC	2010-Aug															
CONDUCTANCE, SPECIFIC	2010-Sep						606		374		569	410	431			
CONDUCTANCE, SPECIFIC	2011-Sep						1917						1194			
CONDUCTANCE, SPECIFIC	2012-Sep				2088						1699		810			
CONDUCTANCE, SPECIFIC	2013-Sep										669	505	667	6240		
CONDUCTANCE, SPECIFIC	2014-Sep					2630	278		242		649	713	513	2970	3360	
CONDUCTANCE, SPECIFIC	2015-Sep	1324		1268					813		1021	738	1051	2280		
CONDUCTANCE, SPECIFIC	2015-Dec	1144														660
CONDUCTANCE, SPECIFIC	2016-Mar	1093														532
CONDUCTANCE, SPECIFIC	2016-Jun	1627														550
CONDUCTANCE, SPECIFIC	2016-Sep	1461		1660							1156		802	7800		550
CONDUCTANCE, SPECIFIC	2017-Aug	2258		2437							1672		1324	12257		1126
CONDUCTANCE, SPECIFIC	2018-Aug	2144		2450							1172		1024	9518		1070
CONDUCTANCE, SPECIFIC	2019-Apr															
CONDUCTANCE, SPECIFIC	2019-Aug			1735							624	533	1123	3933		1546

GW Standard:
None

Note: August 2018 data for GU-1 Temp were listed under GU-2 in previous AWQR appendices.

Appendix D

Statistical Evaluation of Groundwater Monitoring Results

November 25, 2025
File No. 25225073.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – UPL Update
Ottumwa Midland Landfill, Shallow and Pennsylvanian Units, August 2025 Monitoring Event

PREPARED BY: Ryan Matzuk

CHECKED BY: Charles Hostetler

STATISTICAL METHOD

The statistical analysis uses a prediction interval approach as recommended for detection monitoring in the March 2009 U.S. Environmental Protection Agency (U.S. EPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities. For the prediction interval evaluation, interwell testing was selected based on the considerations outlined in Chapter 6 of the Unified Guidance. The statistical program used to calculate the interwell prediction interval is Sanitas™ (Version 10.1.00).

The Ottumwa Midland Landfill (OML) monitoring data are evaluated in two well groups, representing the shallow (water table) and mid-depth (Pennsylvanian) hydrogeologic units. For the shallow hydrogeologic unit, monitoring well MW-1/MW-1R is used as the background well. Monitoring well MW-1R replaced MW-1 beginning with the August 2019 sampling event. The combined historical results for MW-1 and MW-1R are shown under the MW-1R label in the Sanitas™ output. For the mid-depth hydrogeologic unit, piezometer MW-102P is used as the background well.

TIME SERIES PLOTS

Time series plots are prepared for the required monitoring parameters to show the concentration variations over time. Time series graphs are included in **Attachment D1** (Shallow) and **Attachment D2** (Pennsylvanian). For metals, the time series plots only show monitoring results since August 2017, when the monitoring program transitioned from dissolved metals to total metals analysis. For chloride and sulfate, which are not typically affected by filtering, older historical results for background wells are included in the time series plots and are used in the determination of background for the statistical evaluation.

OUTLIER ANALYSIS

An outlier analysis is performed for background monitoring results at upgradient wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas™ outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas™ includes the following steps:

1) Run normality test (Shapiro Wilk/Francia).

2) If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3) If not normally distributed, run Tukey's test for outliers.

4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors; however, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the August 2025 sampling event, the following background values were identified as potential outliers and handled as described:

Shallow Hydrogeologic Unit

- **Fluoride (MW-1/MW-1R)**. One low result from the August 2022 event was flagged as a statistical outlier. This result was kept in the dataset because there was no known explanation for the lower result, and it appeared to be within the range of potential natural variation relative to the other observed fluoride concentrations.

- **Iron (MW-1/MW-1R)**. One high result from the April 2019 event was flagged as a statistical outlier. This result was kept in the dataset because there was no known explanation for the higher result, and it appeared to be within the range of potential natural variation relative to the other observed iron concentrations. Elevated iron and manganese during the April 2019 event suggest a possible change in redox conditions or in suspended solids.

- **Magnesium (MW-1/MW-1R)**. One high result from the August 2017 event was flagged as a statistical outlier. This result was kept in the dataset because there was no known explanation for the higher result, and it appeared to be within the range of potential natural variation relative to the other observed magnesium concentrations.

- **Manganese (MW-1/MW-1R)**. One high result from the April 2019 event was flagged as a statistical outlier. This result was kept in the dataset because there was no known explanation for the higher result, and it appeared to be within the range of potential natural variation relative to the other observed manganese concentrations. Elevated iron and manganese during the April 2019 event suggest a possible change in redox conditions or in suspended solids.

Pennsylvanian Unit

- **Beryllium (MW-102P)**. One high result from the August 2023 event was flagged as a statistical outlier. This result was kept in the dataset because there it appeared to be within the range of potential natural variation relative to the other observed beryllium concentrations. The high non-detect value reflects an elevated minimum limit of detection from the laboratory caused by a 4X dilution factor applied to this parameter.

- **Total Dissolved Solids (MW-102P)**. One low result from the August 2021 event was flagged as a statistical outlier. The result was removed from the dataset during the 2021 data analysis because it appeared likely to represent a laboratory error. The result was approximately 10 percent of previous values, suggesting a possible calculation error. The total dissolved solids (TDS) result was approximately 20 percent of the sulfate value, which also suggested an erroneous result since the TDS should be greater than the sulfate result.

The outlier analysis results are included in **Attachment D3** (Shallow) and **Attachment D4** (Pennsylvanian).

INTERWELL PREDICTION LIMITS

Interwell prediction limits for each hydrogeologic unit are calculated using background data from the upgradient monitoring wells (MW-1/1R and MW-102P) for each monitored constituent with outliers removed as noted above. The prediction limit analysis performed in Sanitas™ includes the following steps:

1) If 100 percent of the background values are non-detect, the Double Quantitation rule applies and no prediction limit is calculated.

2) If 50 percent or more of results are non-detect, then a non-parametric prediction limit is calculated.

3) If fewer than 50 percent of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

4) If normal or transformed normal, calculate parametric prediction limit.

5) If not normal or transformed normal, calculate non-parametric prediction limit.

Consistent with the Unified Guidance, parametric prediction limits are calculated based on a 1-of-2 retesting protocol and a 10 percent site-wide false positive rate. Sanitas™ establishes the per-test

significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the 2025 event, the following values were used:

Parameter	Value	Comments
Evaluations per year	1	August event
Constituents analyzed	15	Shallow: 20 constituents sampled. Beryllium not counted because all but one background result were non-detect. Calcium, lithium, molybdenum, and total suspended solids were added to the program in 2023 and do not meet the minimum requirement of 4 samples for prediction limit statistical analysis. Pennsylvanian: 20 constituents sampled. Selenium not counted because all background result were non-detect. Calcium, lithium, molybdenum, and total suspended solids were added to the program in 2023 and do not meet the minimum requirement of 4 samples for prediction limit statistical analysis.
Compliance wells	9	5 Shallow, 4 Pennsylvanian

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. The non-parametric limit is the highest value in the background dataset. Due to the small sample size, the false positive rate for the non-parametric tests is higher than for the parametric tests, but will go down as more background data are obtained.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantitation Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or quantitation limit. For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were replaced with the detection limit, unless the non-detects represent less than 15 percent of the total samples, in which case one-half of the detection limit was used.

Interwell prediction limit analysis results for 2025 are included in **Attachment D5** (Shallow) and **Attachment D6** (Pennsylvanian).

RM/lmh/cjh

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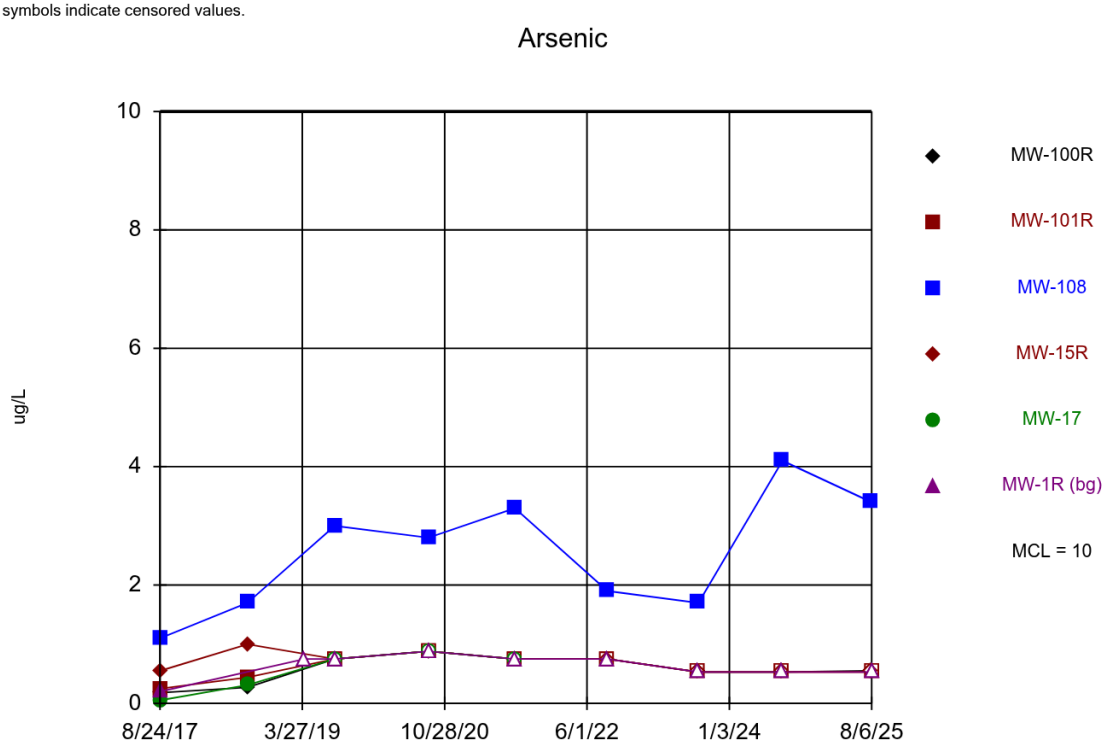
Attachment D1

Times Series Graphs - Shallow

Sanitas™ v.10.1.01 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:26 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

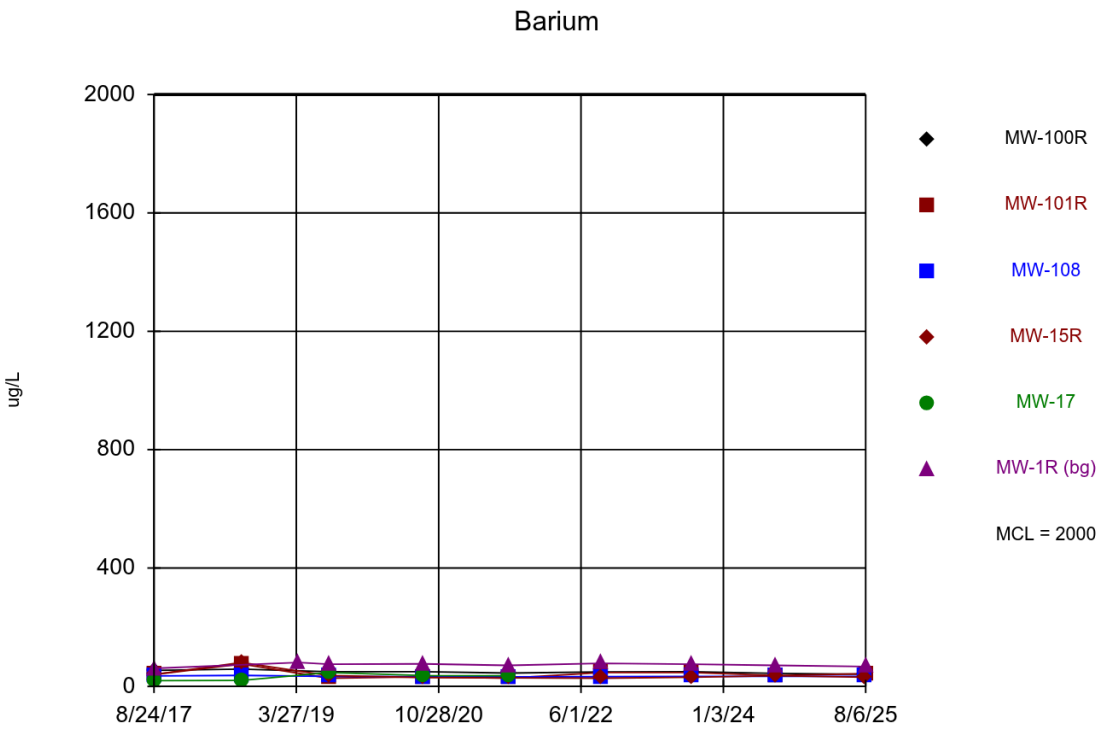
Time Series

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.18 (J)	0.25 (J)	1.1	0.55 (J)	0.052 (J)	0.2 (J)
8/16/2018	0.27 (J)	0.44 (J)	1.7	1	0.31 (J)	
4/6/2019						<0.75
8/7/2019	<0.75	<0.75	3	<0.75	<0.75	<0.75
8/24/2020	<0.88	<0.88	2.8		<0.88	<0.88
8/25/2020				<0.88		
8/10/2021					<0.75	<0.75
8/11/2021	<0.75	<0.75	3.3			
8/12/2021				<0.75		
8/23/2022						<0.75 (U)
8/24/2022	<0.75 (U)	<0.75 (U)	1.9 (J)	<0.75 (U)		
8/29/2023	<0.53 (U)	<0.53 (U)				<0.53 (U)
8/30/2023			1.7 (J)	<0.53 (U)		
8/6/2024	<0.53	<0.53		<0.53		<0.53
8/7/2024			4.1			
8/5/2025	0.55 (J)		3.4	<0.53 (U)		
8/6/2025		<0.53 (U)				<0.53 (U)

ND substitution: RL or RL/2 if <15% NDs.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Barium (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	54.2	40	35.4	40.6	19.4	61
8/16/2018	58.4	75.9	37.1	80.5	20.2	
4/6/2019						81
8/7/2019	50	28	34	37	47	75
8/24/2020	50	33	33		37	76
8/25/2020				30		
8/10/2021					36 (B)	71 (B)
8/11/2021	45 (B)	28 (B)	32 (B)			
8/12/2021				29 (B)		
8/23/2022						78
8/24/2022	49	47	33	28		
8/29/2023	50	47				75
8/30/2023			34	31		
8/6/2024	44	37		36		71
8/7/2024			34			
8/5/2025	41		34 (B)	31 (B)		
8/6/2025		43 (B)				67

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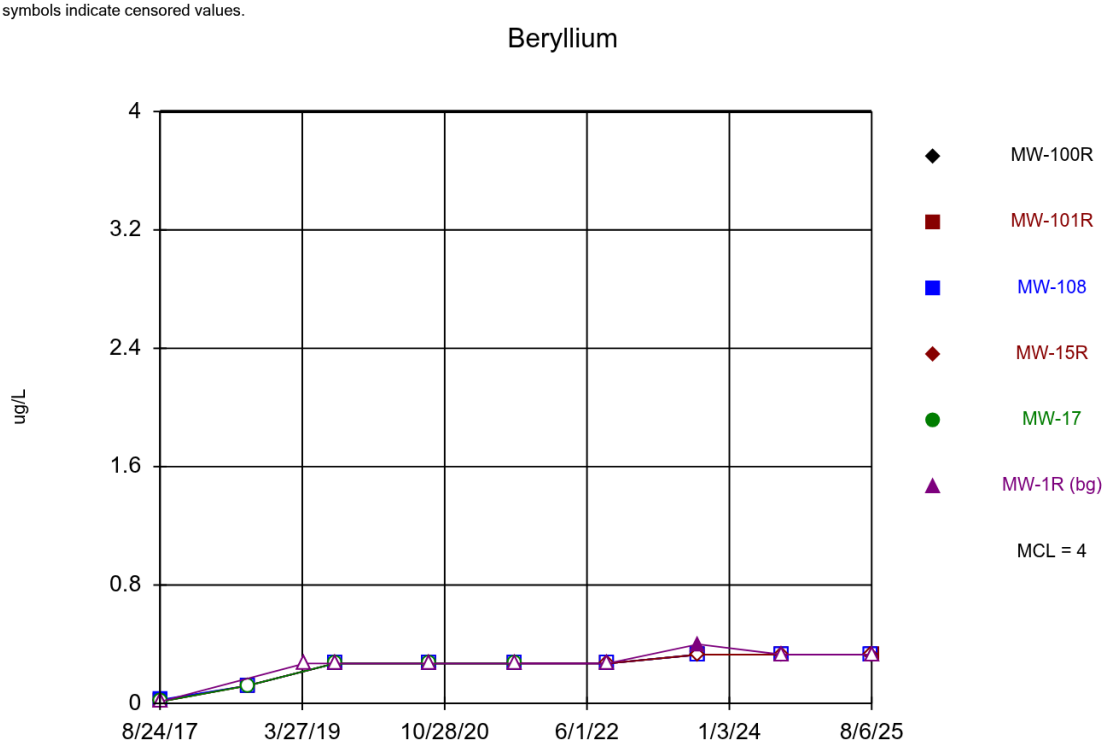

Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	<0.012	0.02 (J)	0.025 (J)	<0.012	<0.012	<0.012
8/16/2018	<0.12	<0.12	<0.12	<0.12	<0.12	
4/6/2019						<0.27
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.27	<0.27	<0.27		<0.27	<0.27
8/25/2020				<0.27		
8/10/2021					<0.27	<0.27
8/11/2021	<0.27	<0.27	<0.27			
8/12/2021				<0.27		
8/23/2022						<0.27 (U)
8/24/2022	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)		
8/29/2023	<0.33 (U)	<0.33 (U)				0.4 (J)
8/30/2023			<0.33 (U)	<0.33 (U)		
8/6/2024	<0.33	<0.33		<0.33		<0.33
8/7/2024			<0.33			
8/5/2025	<0.33 (U)		<0.33 (U)	<0.33 (U)		
8/6/2025		<0.33 (U)				<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.

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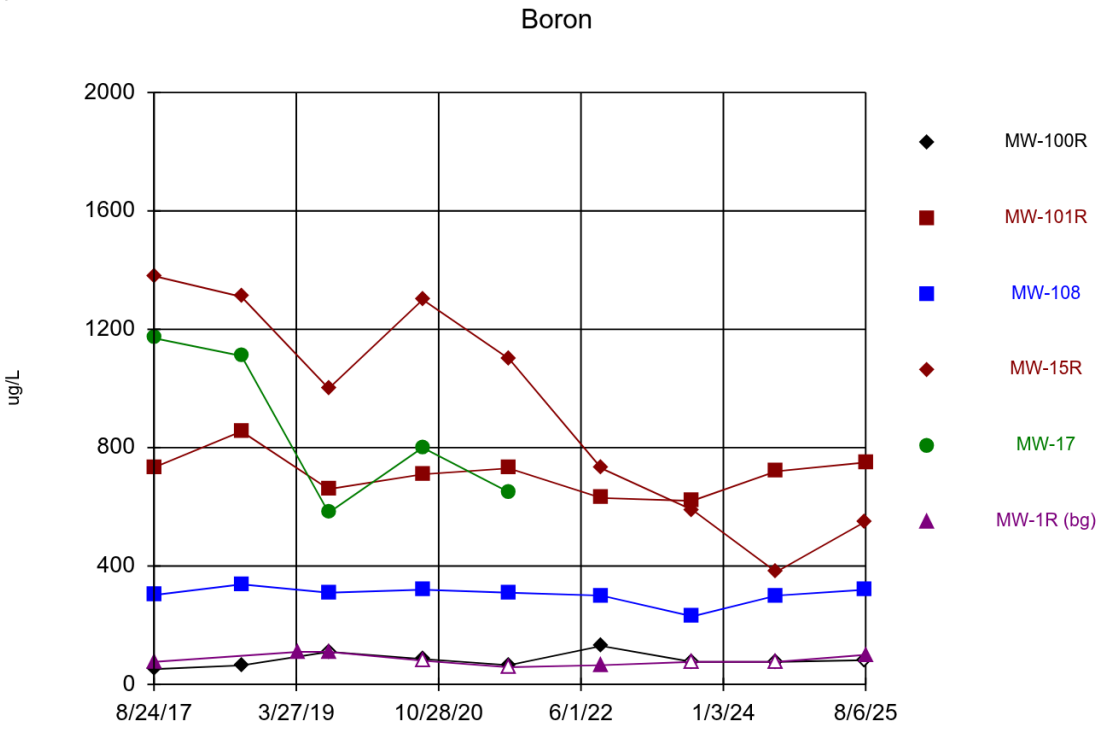
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

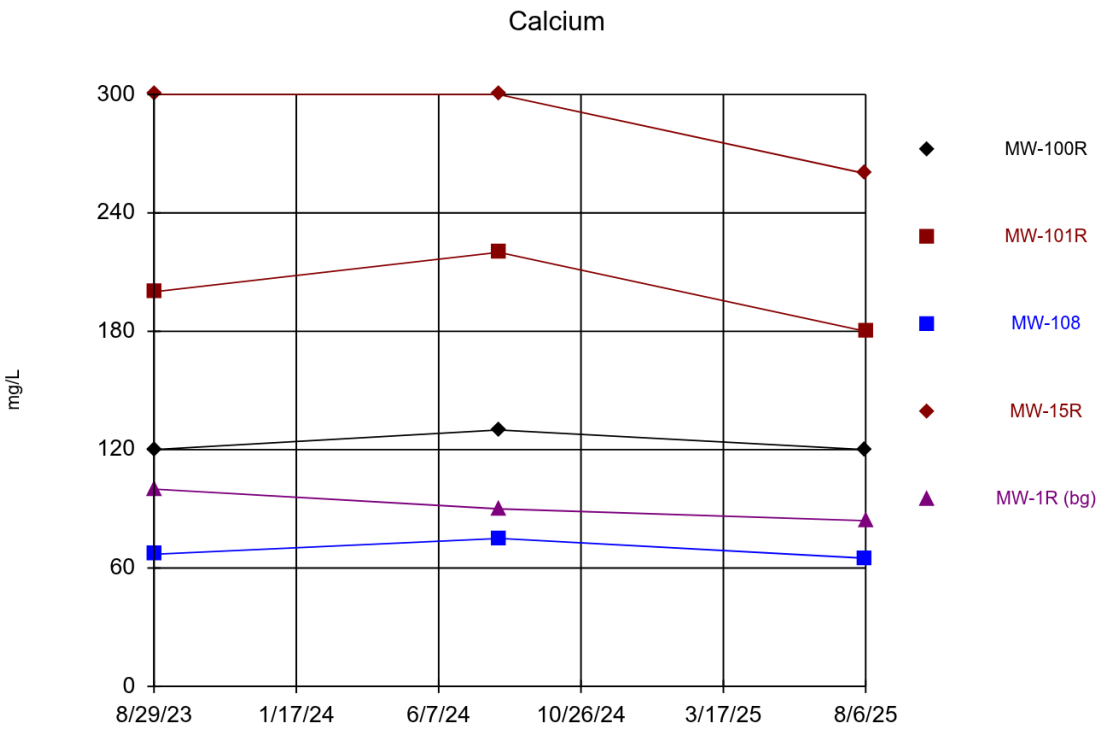
Time Series

Constituent: Boron (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	51.8 (J)	733	302	1380	1170	76 (J)
8/16/2018	64.2 (J)	855	338	1310	1110	
4/6/2019						110 (J)
8/7/2019	<110	660 (B)	310 (B)	1000 (B)	580 (B)	110 (J,B)
8/24/2020	86 (J)	710	320		800	<80
8/25/2020				1300		
8/10/2021					650	<58
8/11/2021	65 (J)	730	310			
8/12/2021				1100		
8/23/2022						65 (J)
8/24/2022	130	630	300	730		
8/29/2023	<76 (U)	620				<76 (U)
8/30/2023			230	590		
8/6/2024	<76	720		380		<76
8/7/2024			300			
8/5/2025	<82 (U)		320	550		
8/6/2025		750				100

ND substitution: RL or RL/2 if <15% NDs.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Calcium (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-1R (bg)
8/29/2023	120	200			100
8/30/2023			67	300	
8/6/2024	130	220		300	90
8/7/2024			75		
8/5/2025	120		65	260	
8/6/2025		180			84

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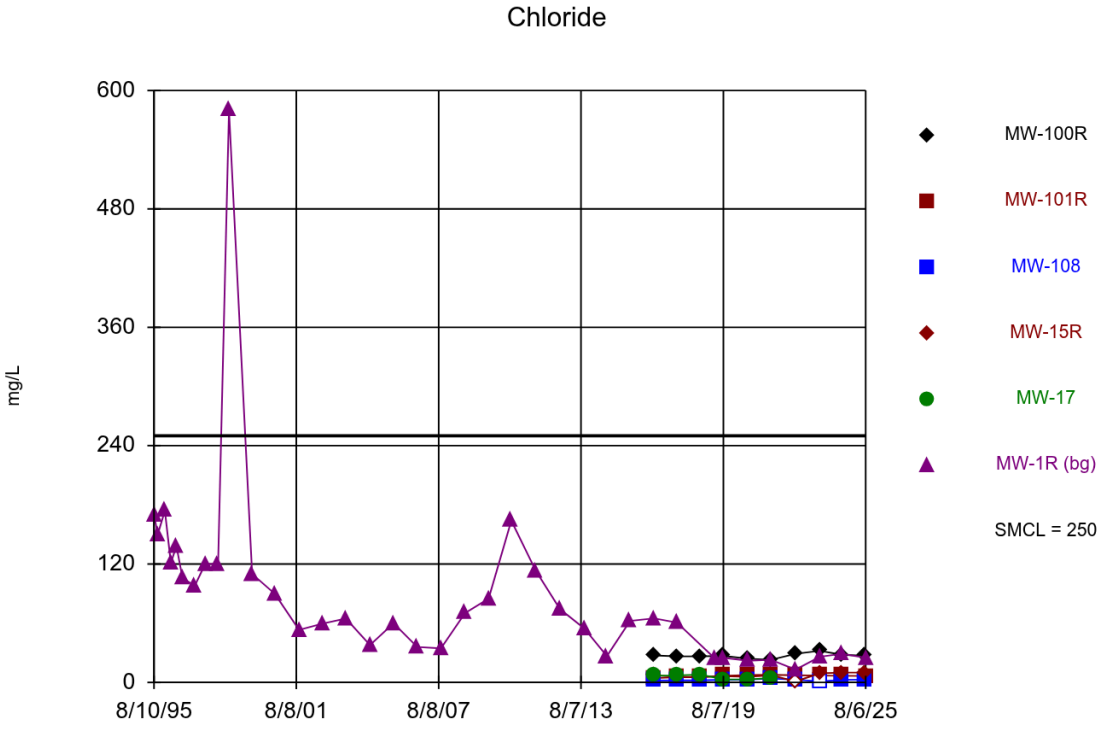

Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/10/1995						170
10/6/1995						150
1/25/1996						174
4/26/1996						121
7/19/1996						138.3
10/21/1996						106
4/28/1997						98
10/6/1997						120
4/22/1998						120
10/7/1998						580 (X)
9/29/1999						110
9/13/2000						89.6
9/19/2001						53.3
9/11/2002						59.5
9/10/2003						64.8
9/15/2004						37.9
9/14/2005						60
9/13/2006						35.9
9/12/2007						34.5
9/17/2008						70.4
9/16/2009						84.9
8/31/2010						164
9/13/2011						113
9/18/2012						74.4
9/27/2013						54.7
9/10/2014						26.6
9/2/2015						62.4
9/7/2016	27.4	4.3	2	7.4	6.7	64.9
8/24/2017	26.4	5.3	2.1	5.6	7	60.6
8/16/2018	26.4	5.3	2.1	5.5	8	
4/6/2019						24
8/7/2019	27	6.7	2.7 (J)	6.3	3.2 (J)	25
8/24/2020	24	7.5	2.8 (J)		3.1 (J)	22
8/25/2020				5.7		
8/10/2021					4.4 (J)	23
8/11/2021	23	7.7	3.9 (J)			
8/12/2021				7.3		
8/23/2022						13
8/24/2022	29	7.3	2.8 (J)	<2.3 (U)		
8/29/2023	32	6.9				26
8/30/2023			<2.3 (U)	9.2		
8/6/2024	28	6.7		10		29
8/7/2024			2.6 (J)			
8/5/2025	27		2.8 (J)	10		
8/6/2025		6.5				25

ND substitution: RL or RL/2 if <15% NDs.

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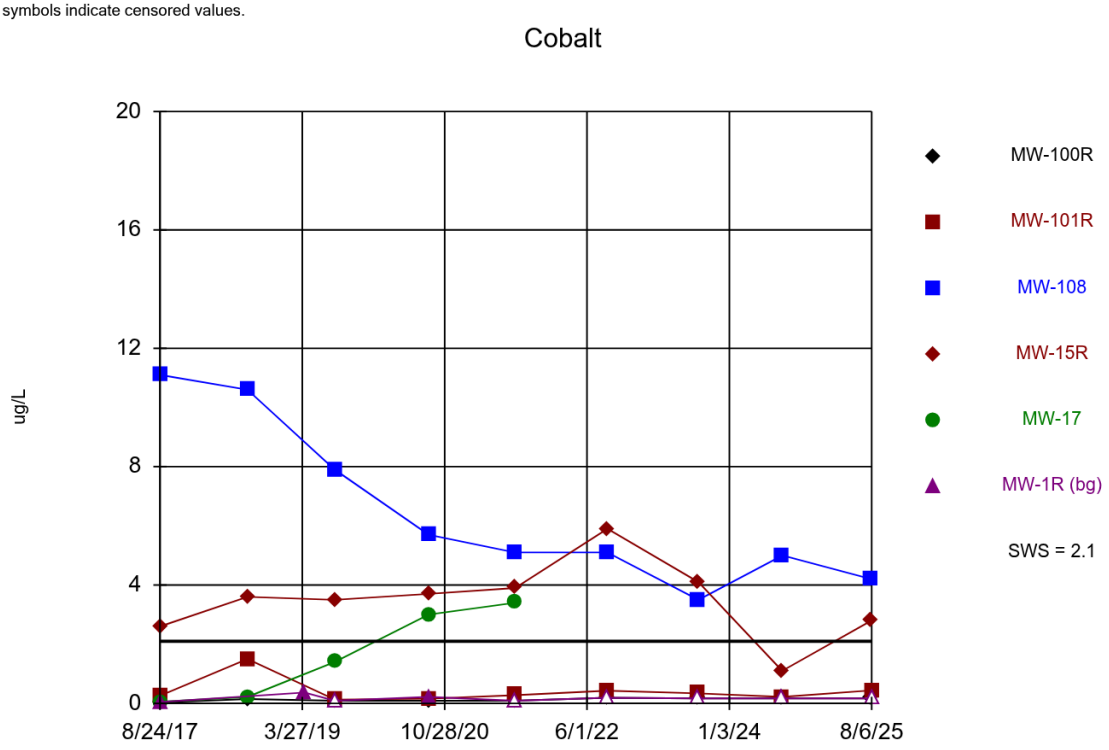

Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.028 (J)	0.26 (J)	11.1	2.6	0.054 (J)	0.049 (J)
8/16/2018	<0.15	1.5	10.6	3.6	0.22 (J)	
4/6/2019						0.37 (J)
8/7/2019	<0.091	0.13 (J)	7.9	3.5	1.4	<0.091
8/24/2020	<0.091	0.16 (J)	5.7		3	0.22 (J)
8/25/2020				3.7		
8/10/2021					3.4	<0.091
8/11/2021	<0.091	0.28 (J)	5.1			
8/12/2021				3.9		
8/23/2022						<0.19 (U)
8/24/2022	<0.19 (U)	0.43 (J)	5.1	5.9		
8/29/2023	<0.17 (U)	0.34 (J)				<0.17 (U)
8/30/2023			3.5	4.1		
8/6/2024	<0.17	0.22 (J)		1.1		<0.17
8/7/2024			5			
8/5/2025	<0.17 (U)		4.2	2.8		
8/6/2025		0.44 (J)				<0.17 (U)

ND substitution: RL or RL/2 if <15% NDs.

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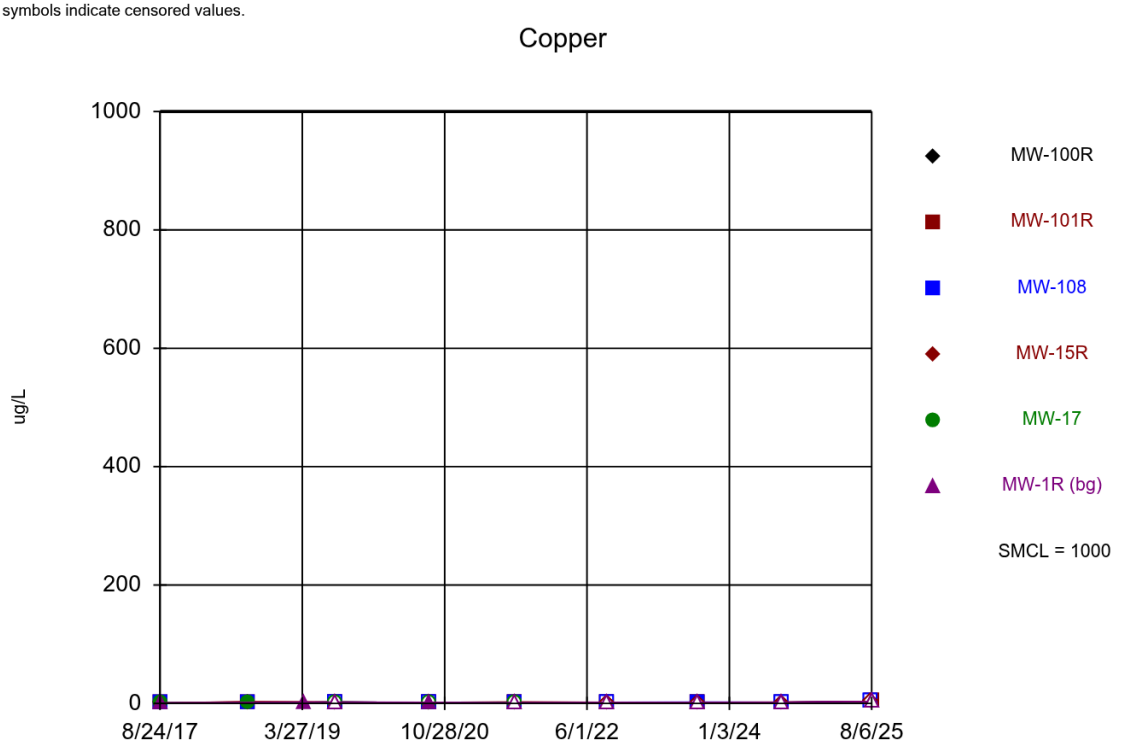
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Copper (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.32 (J)	0.92 (J)	0.61 (J)	0.38 (J)	0.52 (J)	0.99 (J)
8/16/2018	0.74 (J)	2.6	0.57 (J)	2.7	0.66 (J)	
4/6/2019						2.1 (J)
8/7/2019	<2	<2	<2	<2	<2	<2
8/24/2020	<1.5	<1.5	<1.5		<1.5	1.6 (J)
8/25/2020				<1.5		
8/10/2021					<1.4	<1.4
8/11/2021	<1.4	<1.4	1.7 (J)			
8/12/2021				2.5 (J)		
8/23/2022						<1.8 (U)
8/24/2022	<1.8 (U)	<1.8 (U)	<1.8 (U)	<1.8 (U)		
8/29/2023	1.8 (J)	<1.8 (U)				<1.8 (U)
8/30/2023			2 (J)	<1.8 (U)		
8/6/2024	<1.8	2 (J)		1.8 (J)		<1.8
8/7/2024			<1.8			
8/5/2025	<3.2 (U)		<3.2 (U)	<3.2 (U)		
8/6/2025		<3.2 (U)				<3.2 (U)

ND substitution: RL or RL/2 if <15% NDs.

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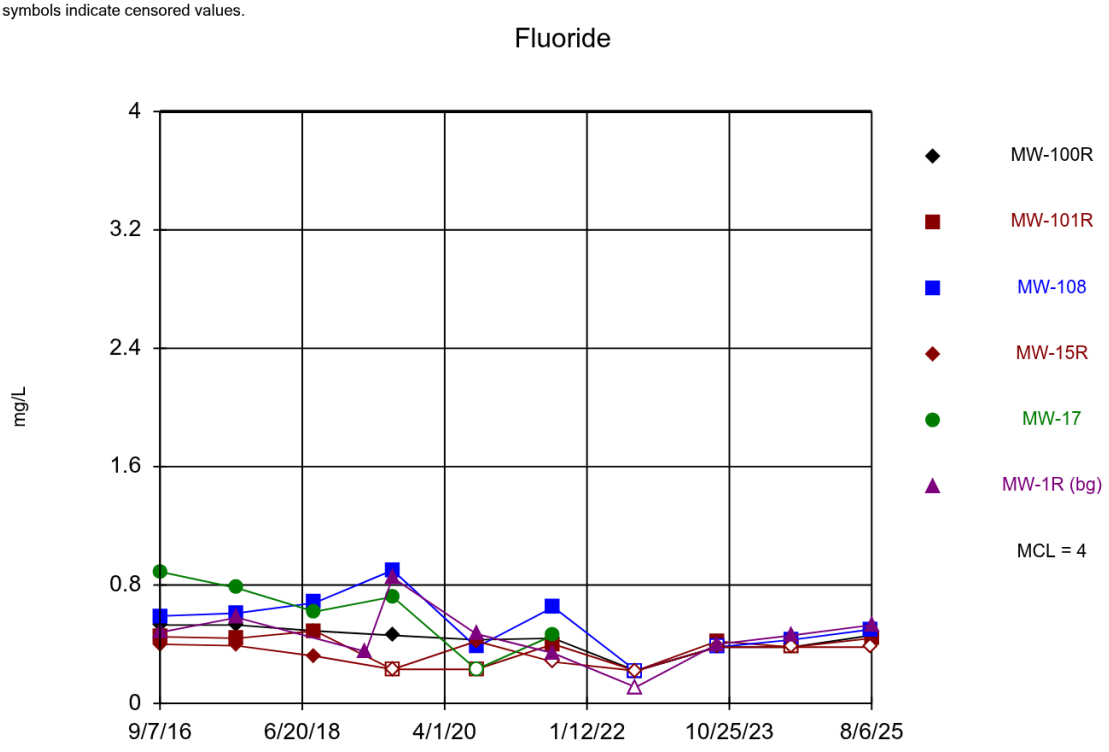
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
9/7/2016	0.53	0.45	0.59	0.4	0.89	0.48
8/24/2017	0.53	0.44	0.61	0.39	0.78	0.58
8/16/2018	0.49	0.49	0.68	0.32	0.62	
4/6/2019						0.35 (J)
8/7/2019	0.46 (J)	<0.23	0.9	<0.23	0.72	0.85
8/24/2020	0.43 (J)	<0.23	0.38 (J)		<0.23	0.47 (J)
8/25/2020				0.42 (J)		
8/10/2021					0.46 (J)	0.34 (J)
8/11/2021	0.44 (J)	0.4 (J)	0.65			
8/12/2021				<0.28		
8/23/2022						<0.22 (U)
8/24/2022	<0.22 (U)	<0.22 (U)	<0.22 (U)	<0.22 (U)		
8/29/2023	<0.38 (U)	0.42 (J)				0.4 (J)
8/30/2023			<0.38 (U)	<0.38 (U)		
8/6/2024	<0.38	<0.38		<0.38		0.46 (J)
8/7/2024			0.43 (J)			
8/5/2025	0.46 (J)		0.5 (J)	<0.38 (U)		
8/6/2025		0.44 (J)				0.53 (J)

ND substitution: RL or RL/2 if <15% NDs.

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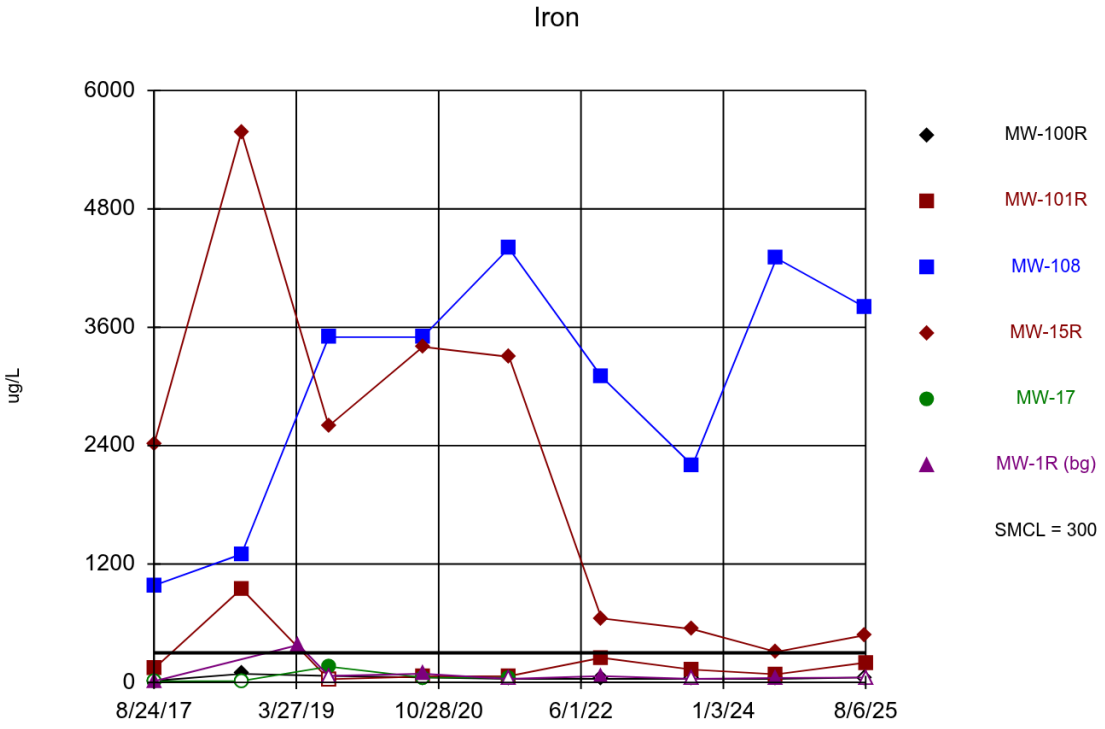
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Iron (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	16.2 (J)	140	983	2410	<9.6	12.5 (J)
8/16/2018	86.3	949	1300	5580	<14.9	
4/6/2019						380
8/7/2019	<66	<66	3500	2600	160	<66
8/24/2020	<50	60 (J)	3500		<50	88 (J)
8/25/2020				3400		
8/10/2021					48 (J)	<36
8/11/2021	<36	64 (J)	4400			
8/12/2021				3300		
8/23/2022						64 (J)
8/24/2022	<36 (U)	250	3100	650		
8/29/2023	<36 (U)	130				<36 (U)
8/30/2023			2200	540		
8/6/2024	<36	82 (J)		310		46 (J)
8/7/2024			4300			
8/5/2025	<50 (U)		3800	480		
8/6/2025		200				<50 (U)

ND substitution: RL or RL/2 if <15% NDs.

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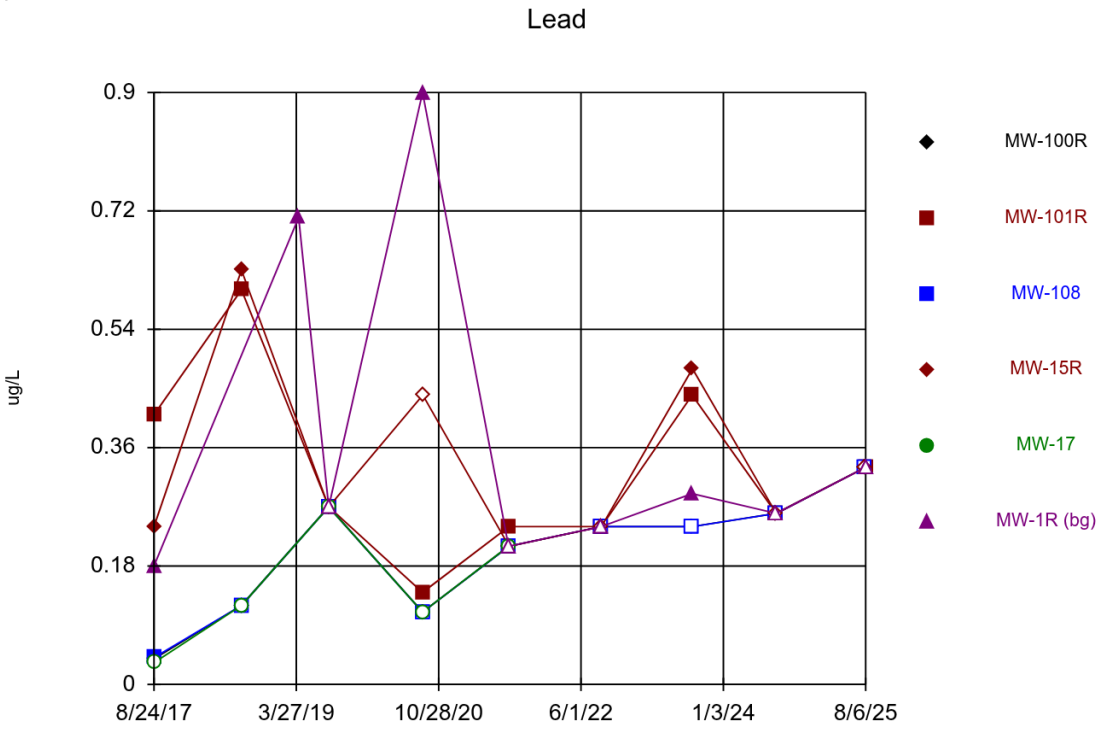
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

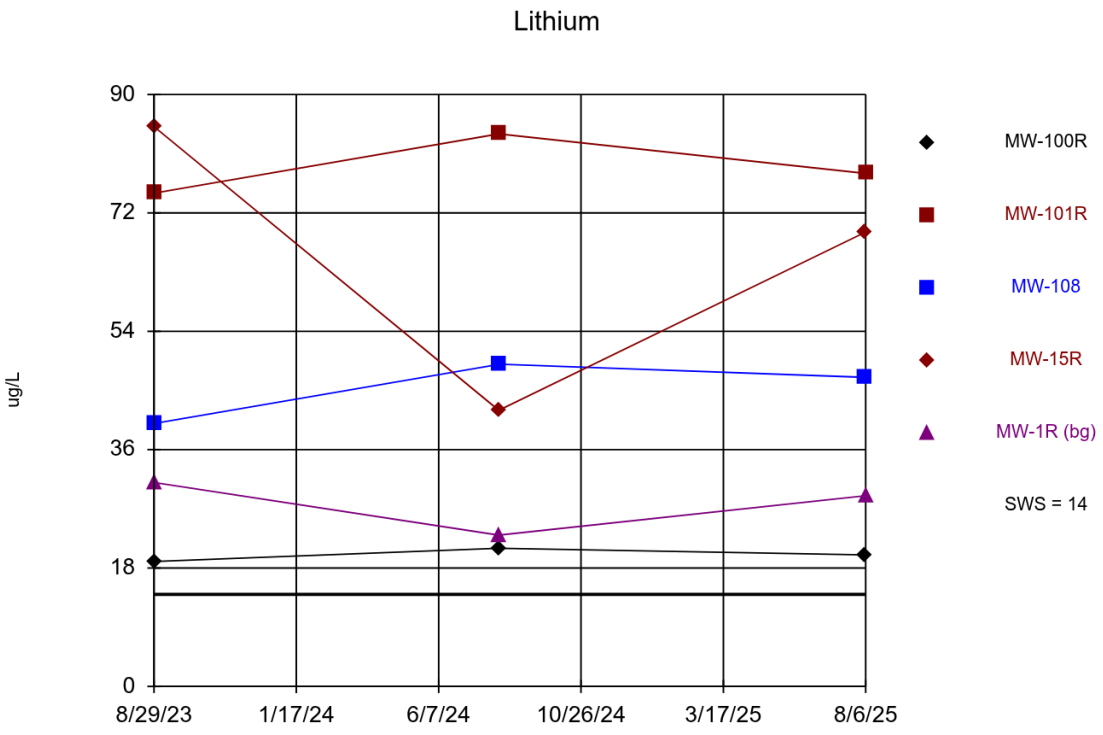
Time Series

Constituent: Lead (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.039 (J)	0.41 (J)	0.041 (J)	0.24 (J)	<0.033	0.18 (J)
8/16/2018	<0.12	0.6 (J)	<0.12	0.63 (J)	<0.12	
4/6/2019						0.71
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.11	0.14 (J)	<0.11		<0.11	0.9
8/25/2020				<0.44		
8/10/2021					<0.21	<0.21
8/11/2021	<0.21	0.24 (J)	<0.21			
8/12/2021				<0.21		
8/23/2022						<0.24 (U)
8/24/2022	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)		
8/29/2023	0.24 (JB)	0.44 (JB)				0.29 (JB)
8/30/2023			<0.24 (U)	0.48 (JB)		
8/6/2024	<0.26	<0.26		<0.26		<0.26
8/7/2024			<0.26			
8/5/2025	<0.33 (U)		<0.33 (U)	<0.33 (U)		
8/6/2025		<0.33 (U)				<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.



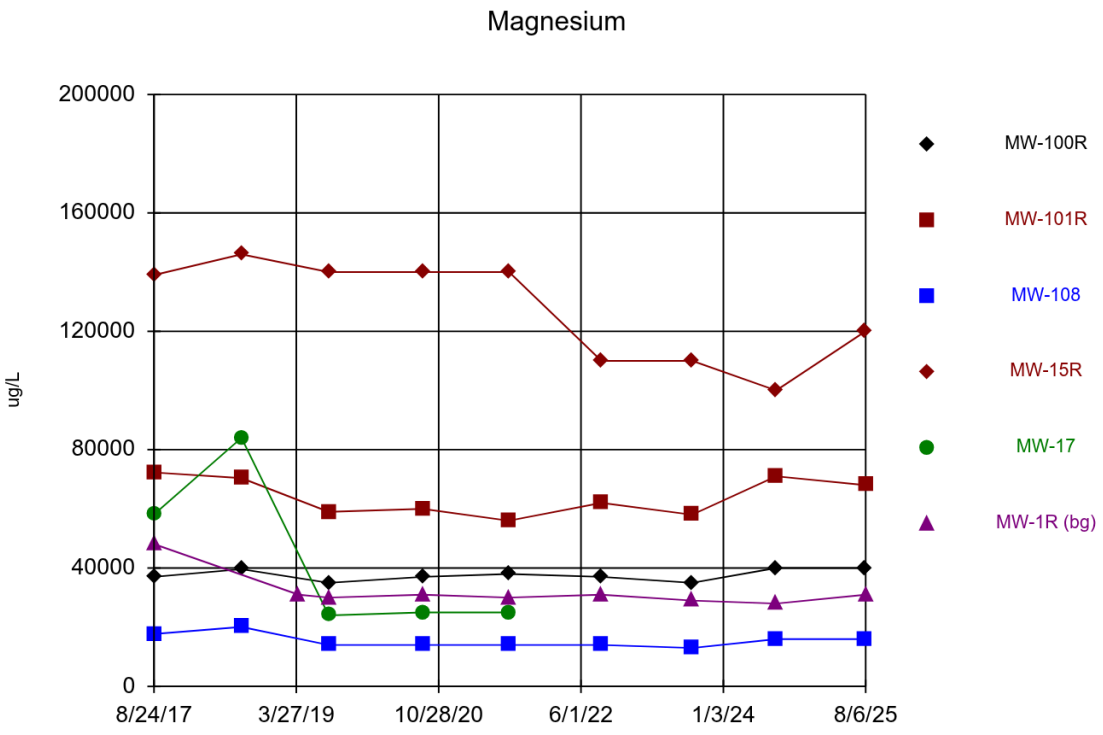
Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Lithium (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-1R (bg)
8/29/2023	19	75			31
8/30/2023			40	85	
8/6/2024	21	84		42	23
8/7/2024			49		
8/5/2025	20		47	69	
8/6/2025		78			29



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	37000	72300	17700	139000	58100	48100
8/16/2018	39600	70400	20100	146000	84000	
4/6/2019						31000
8/7/2019	35000	59000	14000	140000	24000	30000
8/24/2020	37000	60000	14000		25000	31000
8/25/2020				140000		
8/10/2021					25000	30000
8/11/2021	38000	56000	14000			
8/12/2021				140000		
8/23/2022						31000
8/24/2022	37000	62000	14000	110000		
8/29/2023	35000	58000				29000
8/30/2023			13000	110000		
8/6/2024	40000	71000		100000		28000
8/7/2024			16000			
8/5/2025	40000		16000	120000		
8/6/2025		68000				31000

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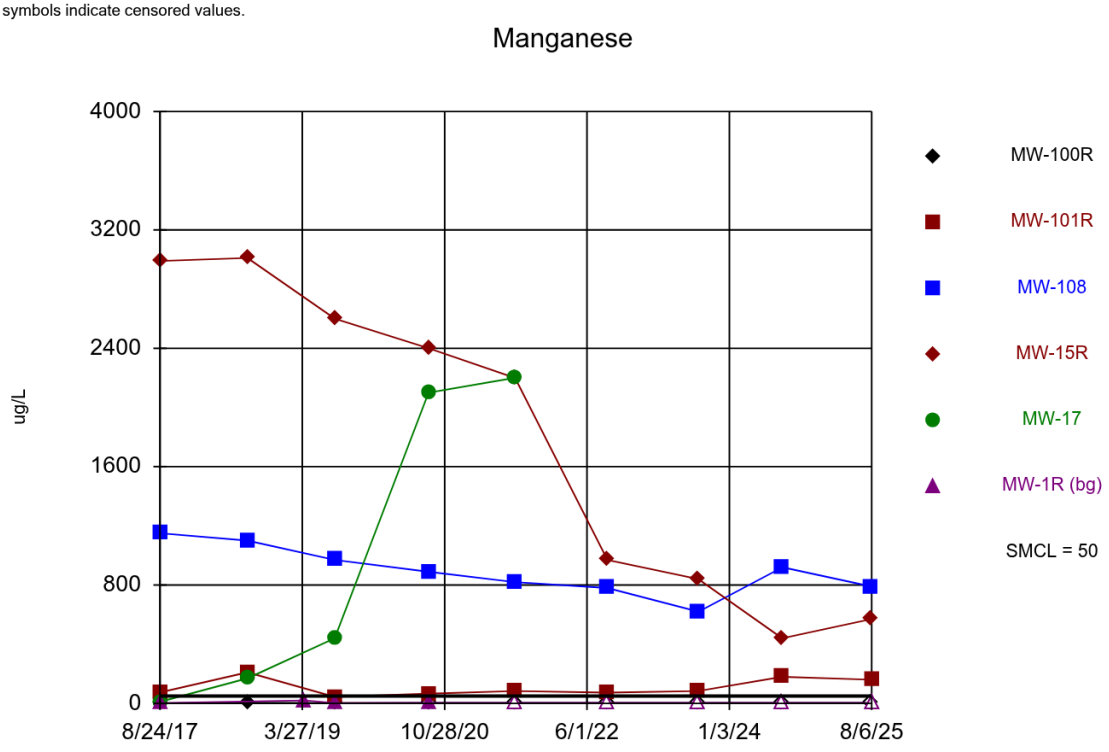
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

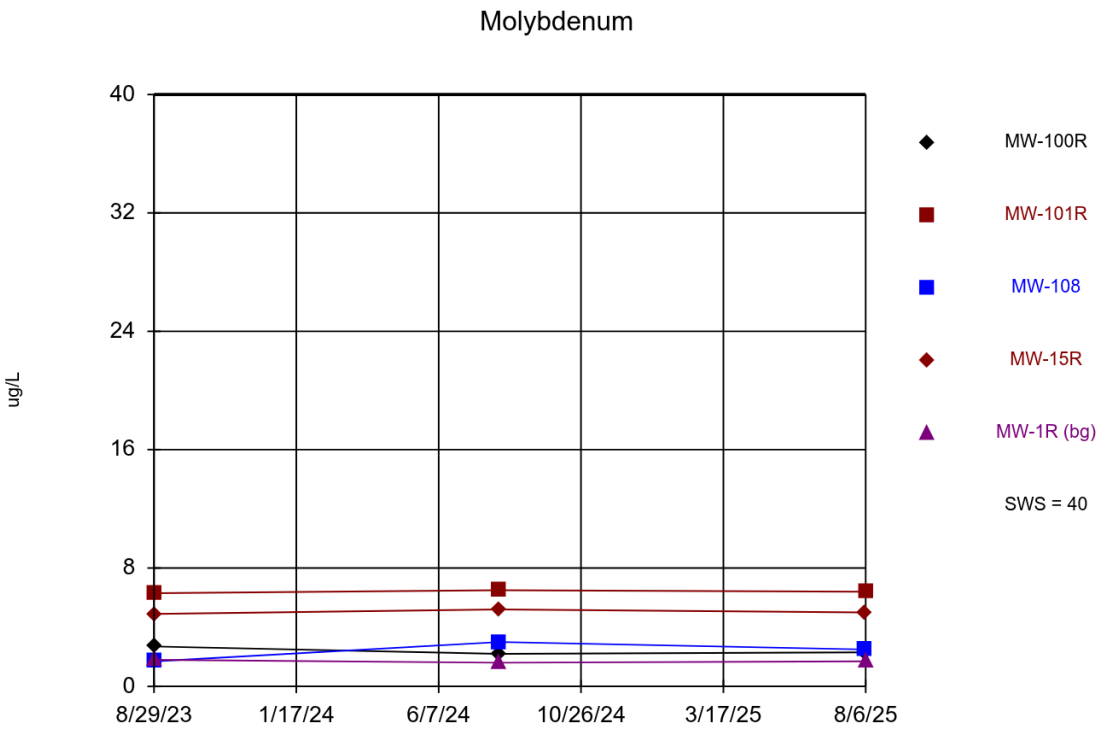
Time Series

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.9 (J)	74.1	1150	2990	10.8	2
8/16/2018	5.6	210	1100	3010	170	
4/6/2019						20
8/7/2019	<2.5	44	970	2600	440	2.8 (J)
8/24/2020	<4	66	890		2100	4.7 (J)
8/25/2020				2400		
8/10/2021					2200	<4.4
8/11/2021	<4.4	84	820			
8/12/2021				2200		
8/23/2022						<3.6 (U)
8/24/2022	<3.6 (U)	73	780	970		
8/29/2023	<3.6 (U)	84				<3.6 (U)
8/30/2023			620	840		
8/6/2024	<3.6	180		440		<3.6
8/7/2024			920			
8/5/2025	<3.6 (U)		790	570		
8/6/2025		160				<3.6 (U)

ND substitution: RL or RL/2 if <15% NDs.



Time Series Analysis Run 10/7/2025 9:27 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Molybdenum (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-1R (bg)
8/29/2023	2.7	6.3			1.8 (J)
8/30/2023			1.7 (J)	4.9	
8/6/2024	2.2	6.5		5.2	1.6 (J)
8/7/2024			3		
8/5/2025	2.3		2.5	5	
8/6/2025		6.4			1.7 (J)

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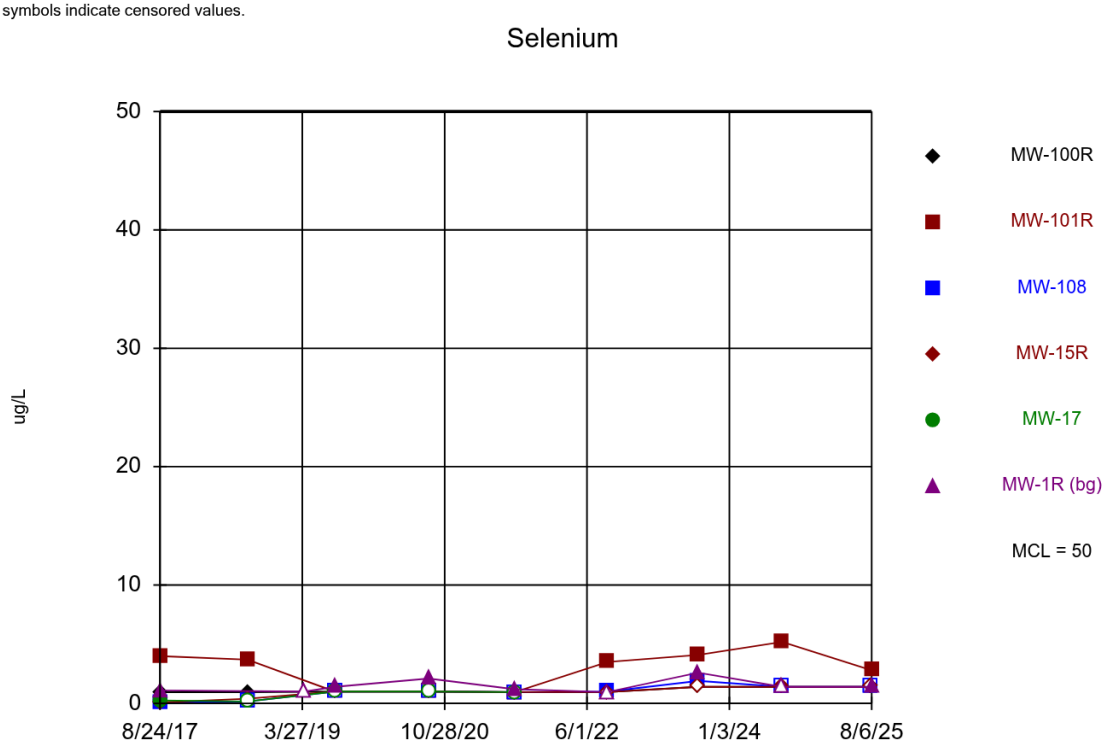
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:28 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

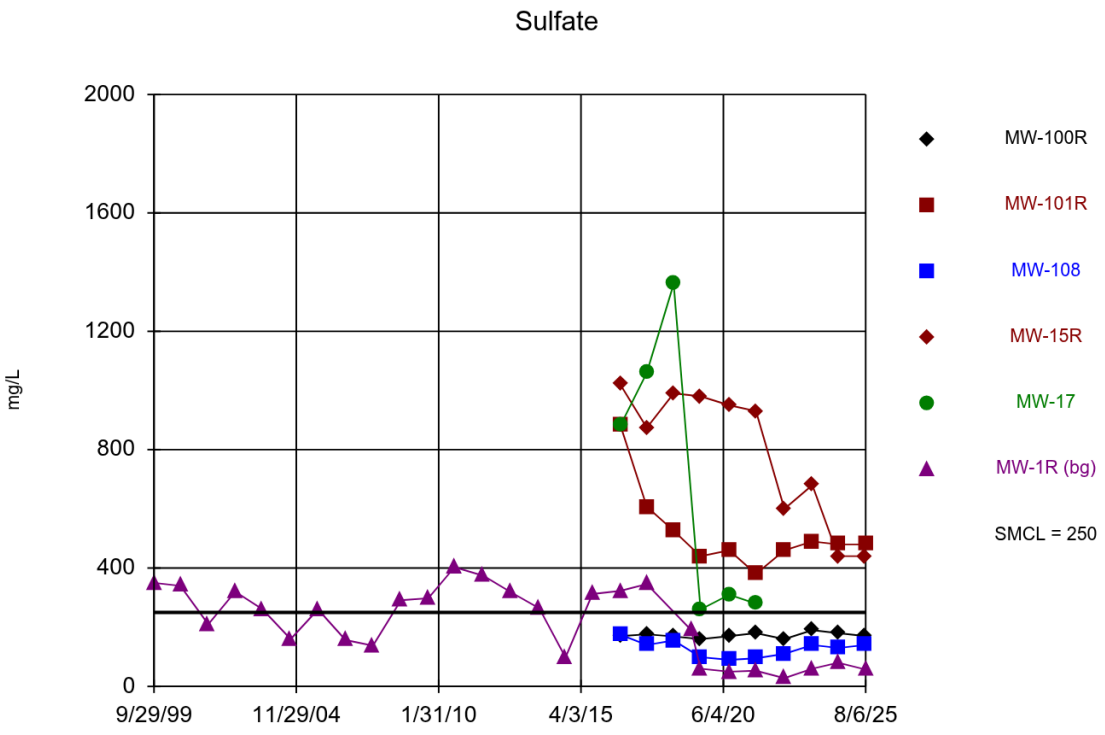
Time Series

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.95 (J)	4	0.089 (J)	<0.086	0.25 (J)	1.1
8/16/2018	0.95 (J)	3.7	<0.16	0.4 (J)	<0.16	
4/6/2019						<1
8/7/2019	<1	1 (J)	<1	<1	<1	1.4 (J)
8/24/2020	<1	<1	<1		<1	2.1 (J)
8/25/2020				<1		
8/10/2021					<0.96	1.2 (J)
8/11/2021	<0.96	<0.96	<0.96			
8/12/2021				<0.96		
8/23/2022						<0.96 (U)
8/24/2022	0.97 (J)	3.5 (J)	1 (J)	<0.96 (U)		
8/29/2023	1.4 (J)	4.1 (J)				2.6 (J)
8/30/2023			1.9 (J)	<1.4 (U)		
8/6/2024	<1.4	5.2		1.4 (J)		<1.4
8/7/2024			<1.4			
8/5/2025	<1.4 (U)		<1.4 (U)	<1.4 (U)		
8/6/2025		2.8 (J)				1.4 (J)

ND substitution: RL or RL/2 if <15% NDs.



Time Series Analysis Run 10/7/2025 9:28 AM View: Shallow Hydrogeologic Unit

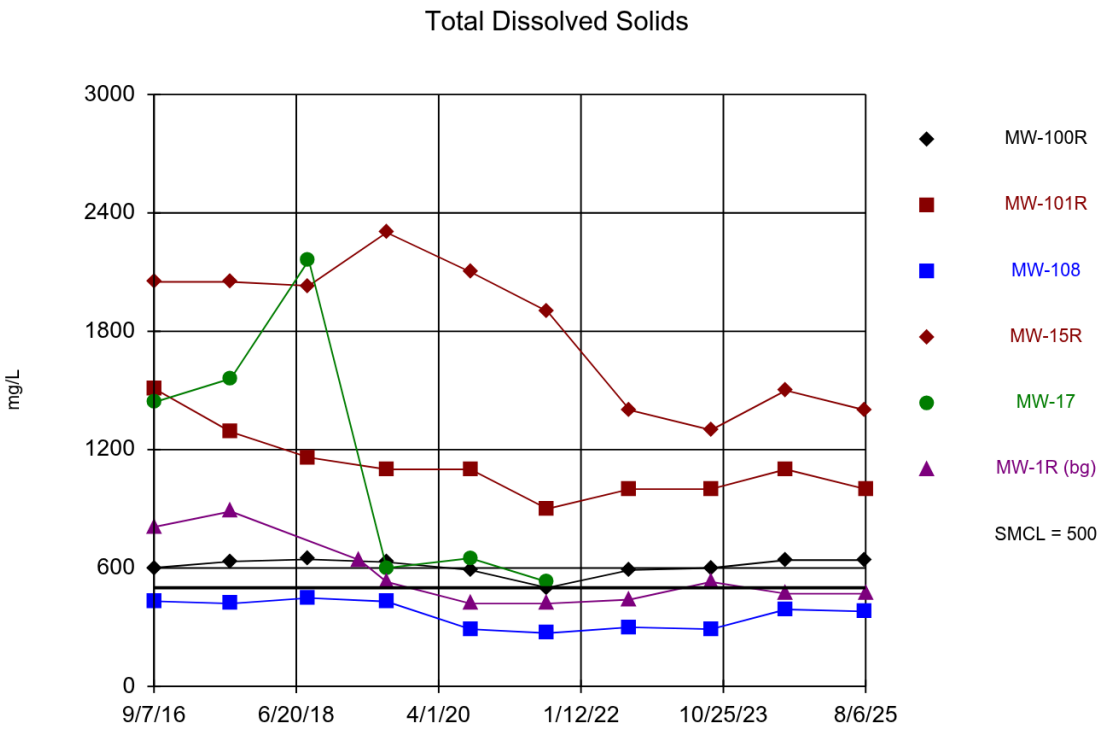
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
9/29/1999						350
9/13/2000						340
9/19/2001						210
9/11/2002						320
9/10/2003						260
9/15/2004						160
9/14/2005						260
9/13/2006						157
9/12/2007						138
9/17/2008						291
9/16/2009						298
8/31/2010						403
9/13/2011						374
9/18/2012						318
9/27/2013						264
9/10/2014						97.8
9/2/2015						312
9/7/2016	170	883	175	1020	881	323
8/24/2017	176	607	140	874	1060	346
8/16/2018	169	526	155	990	1360	
4/6/2019						190
8/7/2019	160	440	99	980	260	60
8/24/2020	170	460	90		310	50
8/25/2020				950		
8/10/2021					280	53
8/11/2021	180	380	95			
8/12/2021				930		
8/23/2022						28
8/24/2022	160	460	110	600		
8/29/2023	190	490				60
8/30/2023			140	680		
8/6/2024	180	480		440		80
8/7/2024			130			
8/5/2025	170		140	440		
8/6/2025		480				57



Time Series Analysis Run 10/7/2025 9:28 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
9/7/2016	601	1510	432	2050	1440	808
8/24/2017	633	1290	420	2050	1560	887
8/16/2018	644	1160	448	2030	2160	
4/6/2019						640
8/7/2019	630	1100	430	2300	600	530
8/24/2020	590	1100	290		650	420
8/25/2020				2100		
8/10/2021					530	420
8/11/2021	500	900	270			
8/12/2021				1900		
8/23/2022						440
8/24/2022	590	1000	300	1400		
8/29/2023	600	1000				530
8/30/2023			290	1300		
8/6/2024	640	1100		1500		470
8/7/2024			390			
8/5/2025	640		380	1400		
8/6/2025		1000				470

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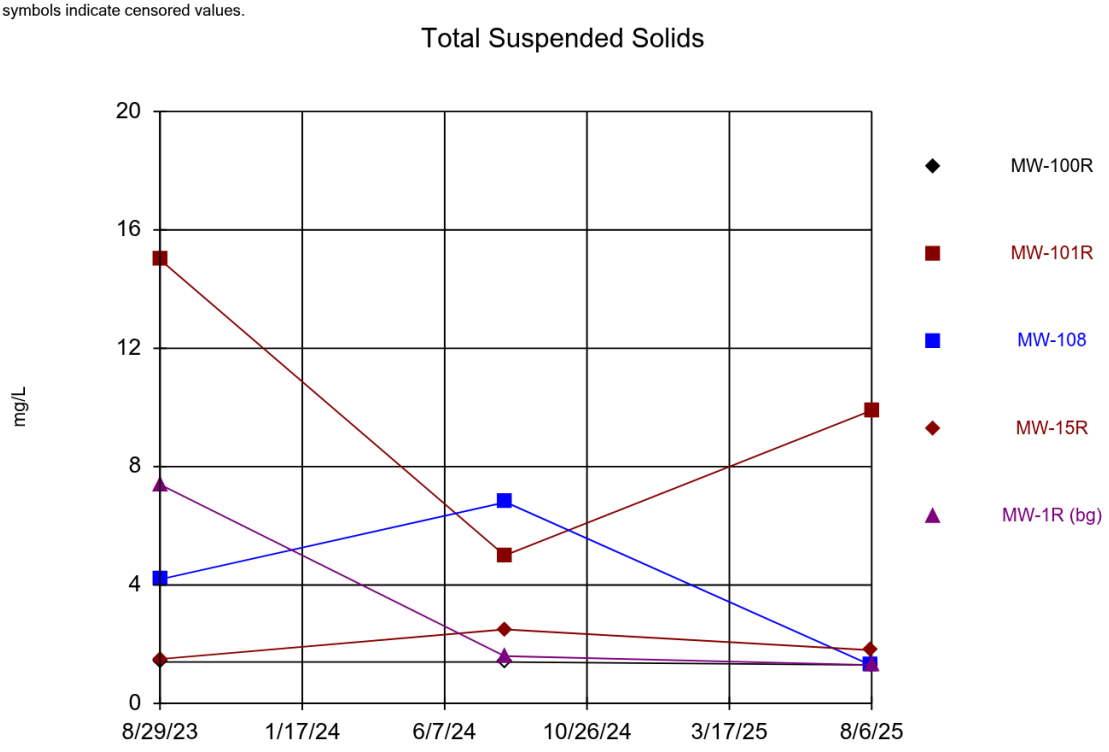

Time Series Analysis Run 10/7/2025 9:28 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Total Suspended Solids (mg/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-1R (bg)
8/29/2023	1.4 (J)	15			7.4
8/30/2023			4.2	1.5 (J)	
8/6/2024	<1.4	5		2.5	1.6 (J)
8/7/2024			6.8		
8/5/2025	<1.3 (U)		1.3 (J)	1.8 (J)	
8/6/2025		9.9			1.3 (J)

ND substitution: RL or RL/2 if <15% NDs.

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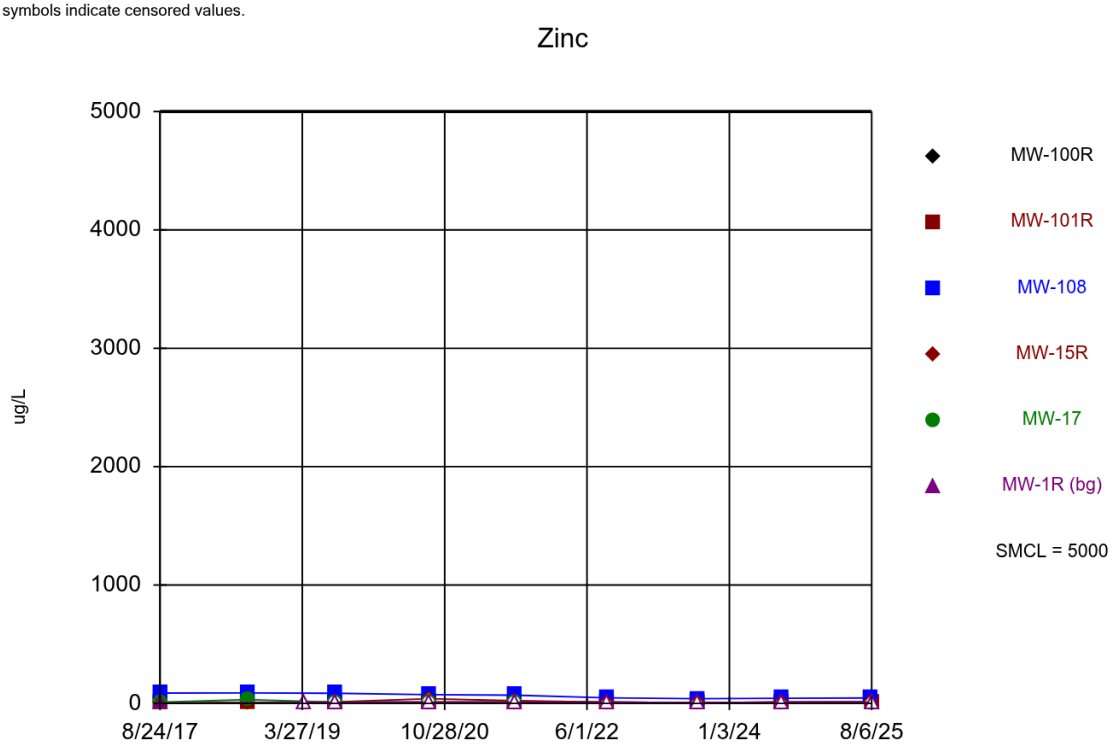
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:28 AM View: Shallow Hydrogeologic Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 9:30 AM View: Shallow Hydrogeologic Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-101R	MW-108	MW-15R	MW-17	MW-1R (bg)
8/24/2017	0.88 (J)	1.8 (J)	87.8	1.5 (J)	10.4	2.4 (J)
8/16/2018	<3.7	6.7 (J)	88.1	6 (J)	31.4	
4/6/2019						<10
8/7/2019	<10	<10	86	13 (J)	<10	<10
8/24/2020	<10	<10	74		<10	<10
8/25/2020				<40		
8/10/2021					<10	<10
8/11/2021	<10	<10	70			
8/12/2021				23		
8/23/2022						<10 (U)
8/24/2022	<10 (U)	<10 (U)	47	<10 (U)		
8/29/2023	<6.4 (U)	<6.4 (U)				<6.4 (U)
8/30/2023			40	<6.4 (U)		
8/6/2024	<9.7	<9.7		<9.7		<9.7
8/7/2024			43			
8/5/2025	<13 (U)		46	<13 (U)		
8/6/2025		<13 (U)				<13 (U)

ND substitution: RL or RL/2 if <15% NDs.

Attachment D2

Times Series Graphs - Pennsylvanian

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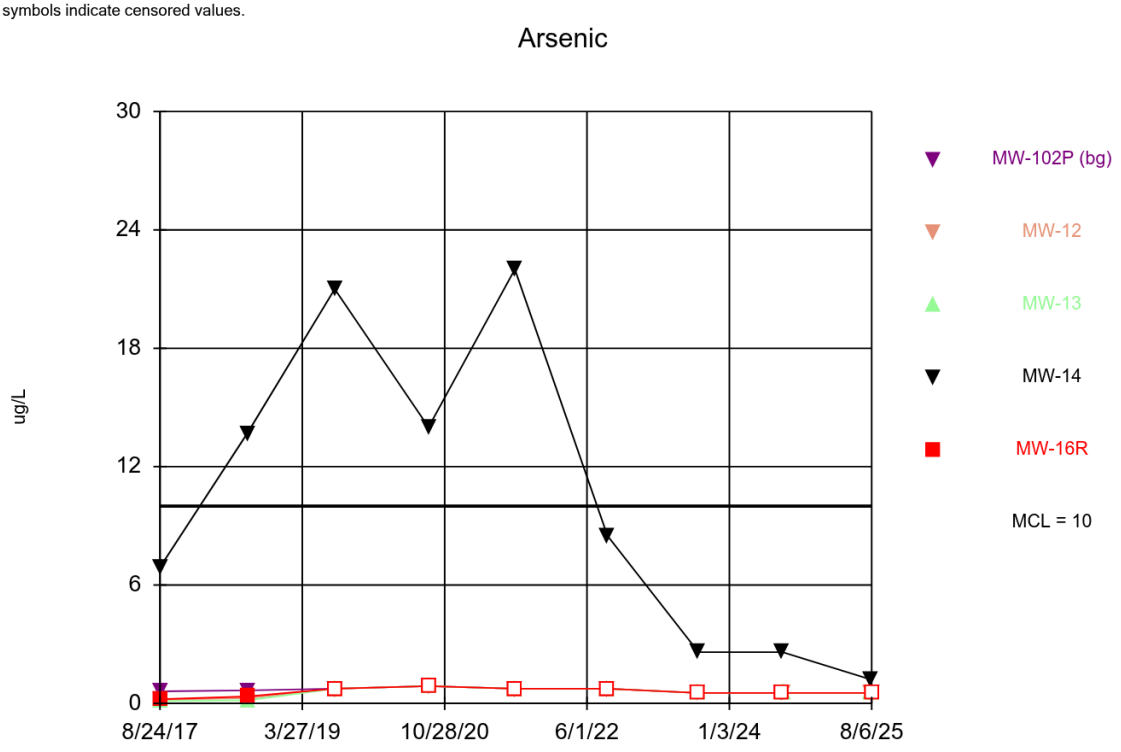
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

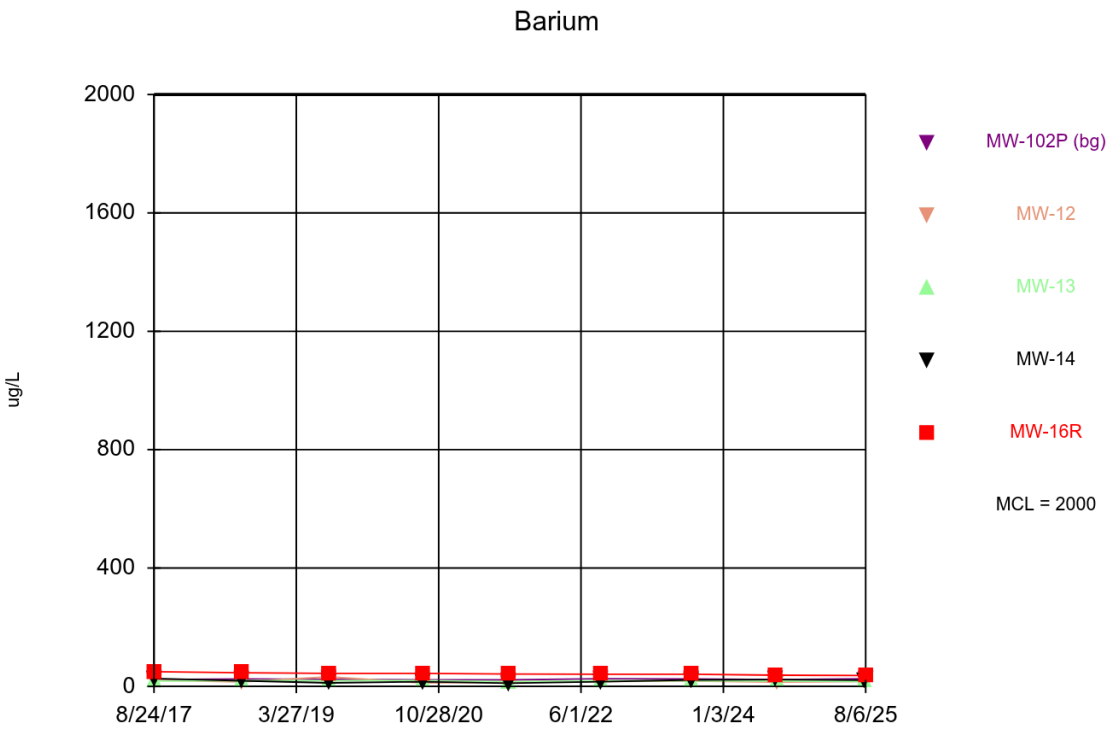
Time Series

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	0.61 (J)	0.19 (J)	0.12 (J)	6.9	0.21 (J)
8/16/2018	0.66 (J)	0.27 (J)	0.16 (J)	13.7	0.35 (J)
8/7/2019	<0.75	<0.75	<0.75	21	<0.75
8/24/2020	<0.88	<0.88	<0.88	14	
8/25/2020					<0.88
8/10/2021		<0.75			
8/11/2021	<0.75		<0.75	22	<0.75
8/24/2022	<0.75 (U)	<0.75 (U)	<0.75 (U)	8.5	<0.75 (U)
8/29/2023	<0.53 (U)	<0.53 (U)			<0.53 (U)
8/30/2023			<0.53 (U)	2.6	
8/7/2024	<0.53			2.6	<0.53
8/8/2024		<0.53	<0.53		
8/5/2025		<0.53 (U)	<0.53 (U)	1.2 (J)	
8/6/2025	<0.53 (U)				<0.53 (U)

ND substitution: RL or RL/2 if <15% NDs.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Barium (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	22.7	21	18.2	26.8	49.7
8/16/2018	25.2	15.5	19.9	19.3	46.4
8/7/2019	24	32	19	12	44
8/24/2020	22	12	20	16	
8/25/2020					44
8/10/2021		15 (B)			
8/11/2021	22 (B)		16 (B)	11 (B)	42 (B)
8/24/2022	26	17	19	16	41
8/29/2023	25	18			41
8/30/2023			19	22	
8/7/2024	23			23	38
8/8/2024		15	18		
8/5/2025		17	17	21	
8/6/2025	26 (B)				37 (B)

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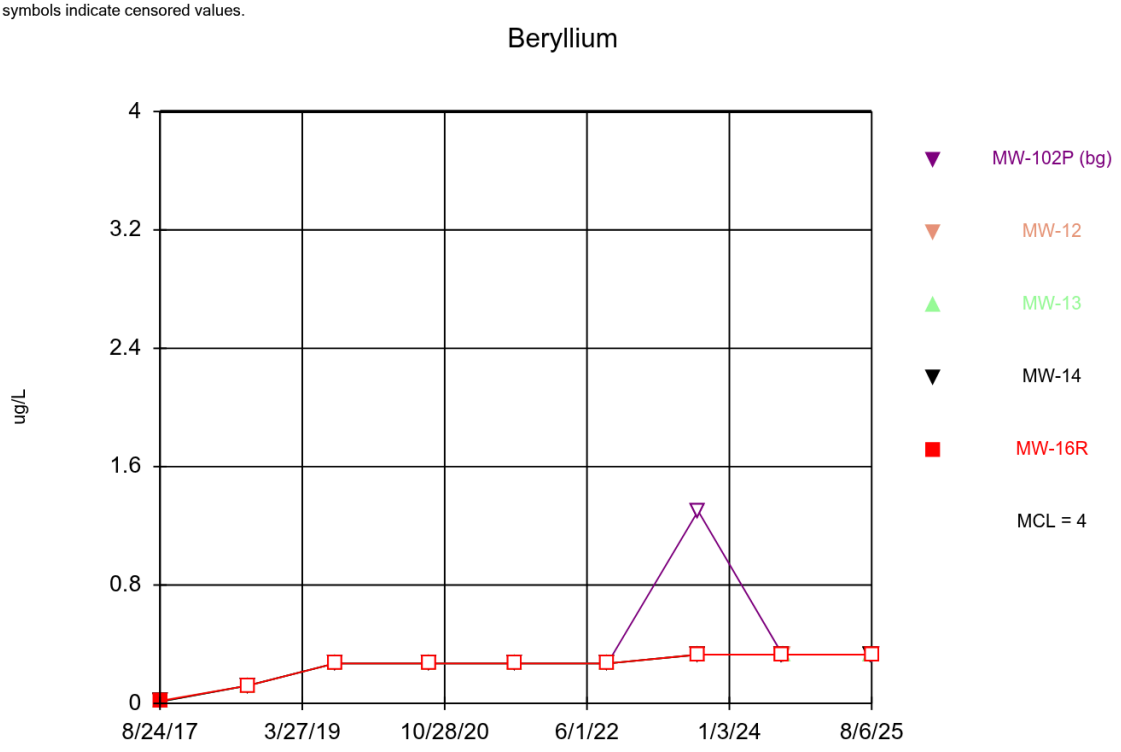
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

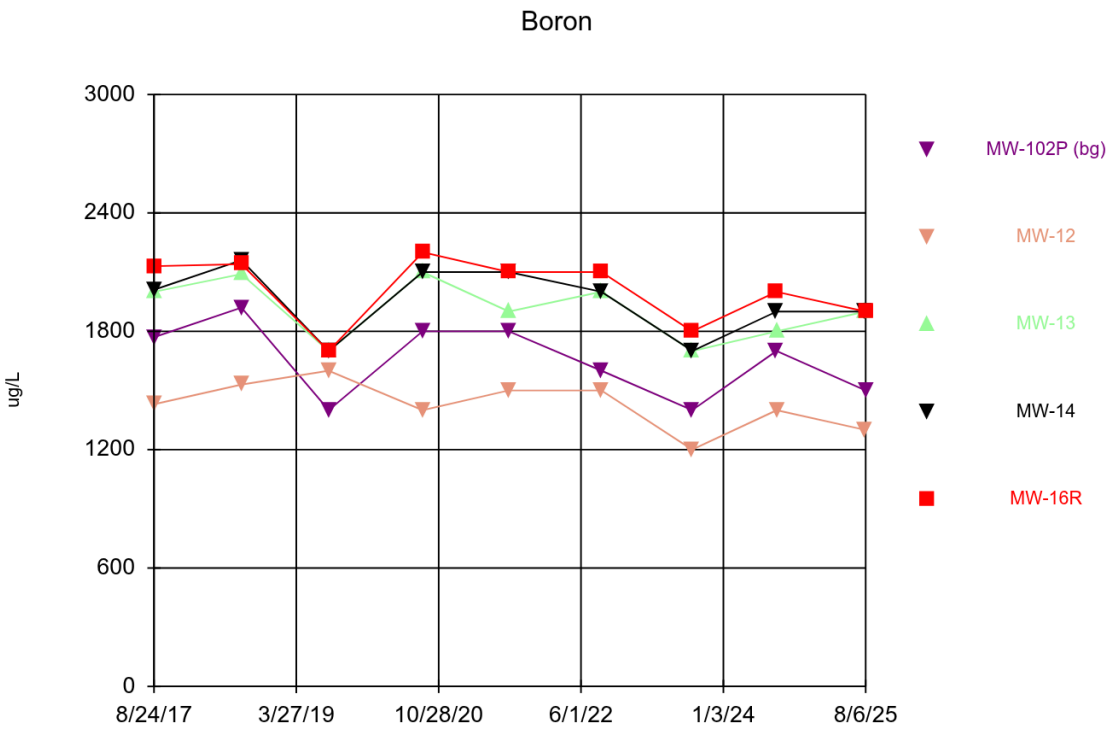
Time Series

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	0.013 (J)	0.019 (J)	<0.012	<0.012	0.016 (J)
8/16/2018	<0.12	<0.12	<0.12	<0.12	<0.12
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.27	<0.27	<0.27	<0.27	
8/25/2020					<0.27
8/10/2021		<0.27			
8/11/2021	<0.27		<0.27	<0.27	<0.27
8/24/2022	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)
8/29/2023	<1.3 (U)	<0.33 (U)			<0.33 (U)
8/30/2023			<0.33 (U)	<0.33 (U)	
8/7/2024	<0.33			<0.33	<0.33
8/8/2024		<0.33	<0.33		
8/5/2025		<0.33 (U)	<0.33 (U)	<0.33 (U)	
8/6/2025	<0.33 (U)				<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.

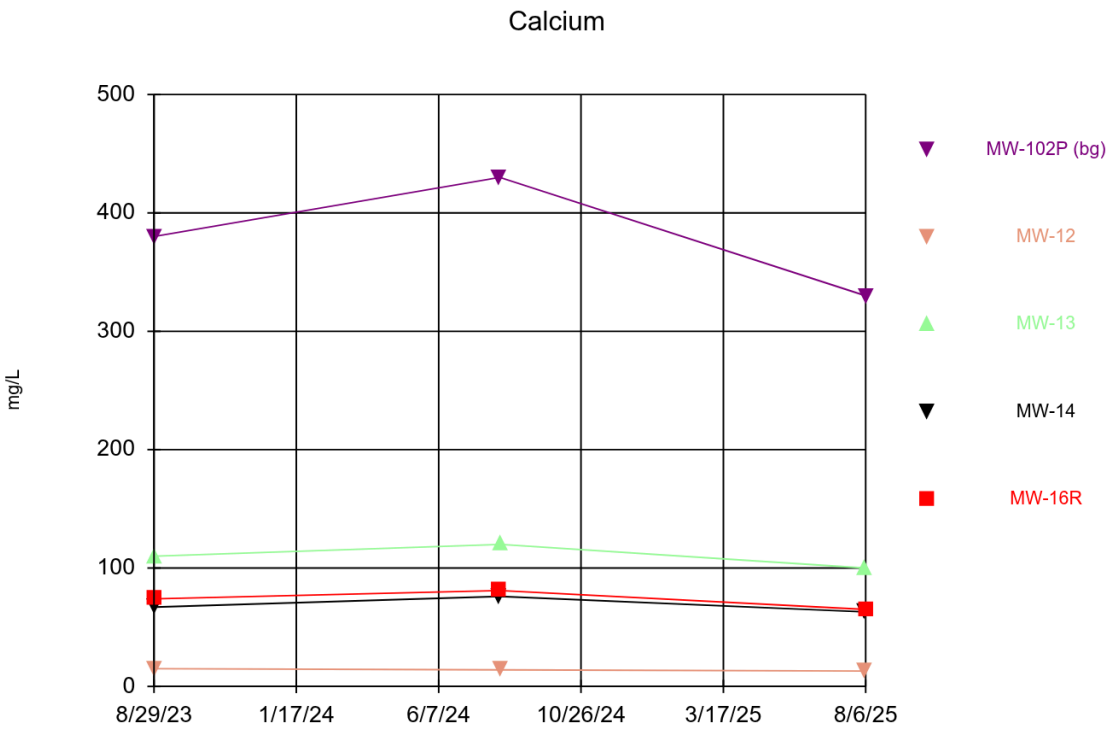


Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Boron (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	1770	1430	2000	2010	2130
8/16/2018	1920	1530	2090	2160	2140
8/7/2019	1400 (B)	1600 (B)	1700 (B)	1700 (B)	1700 (B)
8/24/2020	1800	1400	2100	2100	
8/25/2020					2200
8/10/2021		1500			
8/11/2021	1800		1900	2100	2100
8/24/2022	1600	1500	2000	2000	2100
8/29/2023	1400	1200			1800
8/30/2023			1700	1700	
8/7/2024	1700			1900	2000
8/8/2024		1400	1800		
8/5/2025		1300	1900	1900	
8/6/2025	1500				1900



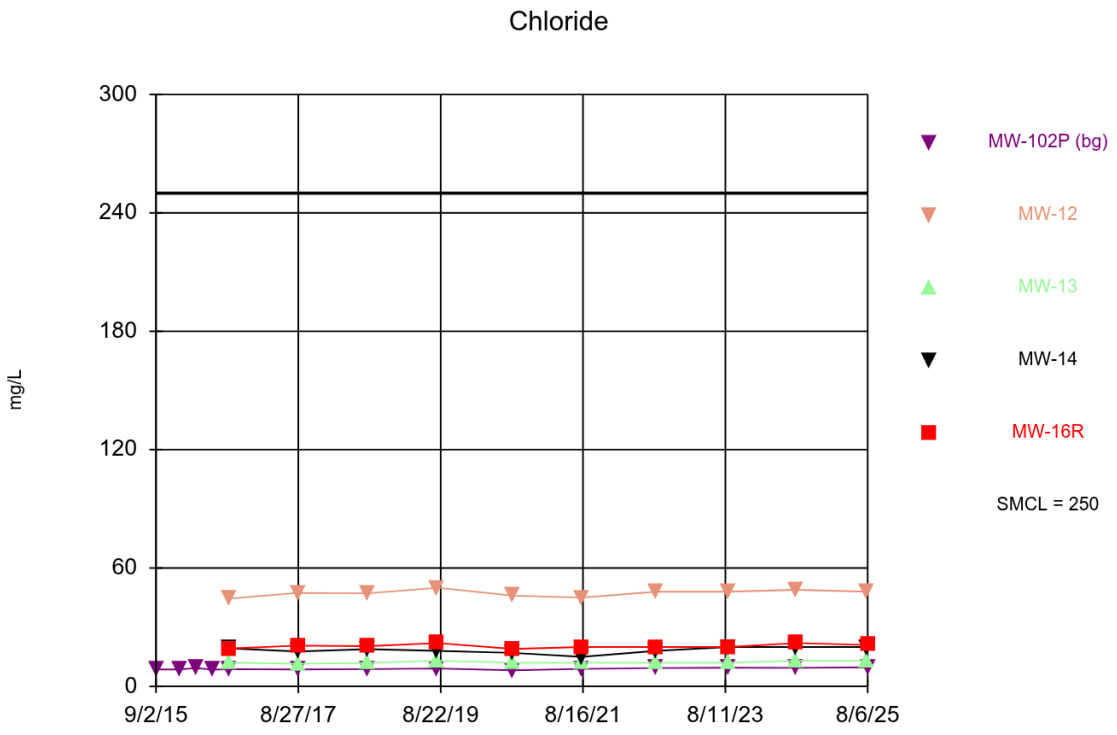
Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Calcium (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/29/2023	380	15			74
8/30/2023			110	67	
8/7/2024	430			76	81
8/8/2024		14	120		
8/5/2025		13	100	63	
8/6/2025	330				65



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
9/2/2015	8.6				
12/30/2015	8.6				
3/23/2016	9.3				
6/21/2016	8.5				
9/7/2016	8.8	44.5	12.1	19.3	19.2
8/24/2017	8.6	47.4	11.5	17.7	20.7
8/16/2018	8.8	47.2	11.9	18.9	20.4
8/7/2019	9.1	50	13	18	22
8/24/2020	8.2	46	12	17	
8/25/2020					19
8/10/2021		45			
8/11/2021	8.9		12	15	20
8/24/2022	9.3	48	12	18	20
8/29/2023	9.5	48			20
8/30/2023			12	20	
8/7/2024	9.4			20	22
8/8/2024		49	13		
8/5/2025		48	13	20	
8/6/2025	9.7				21

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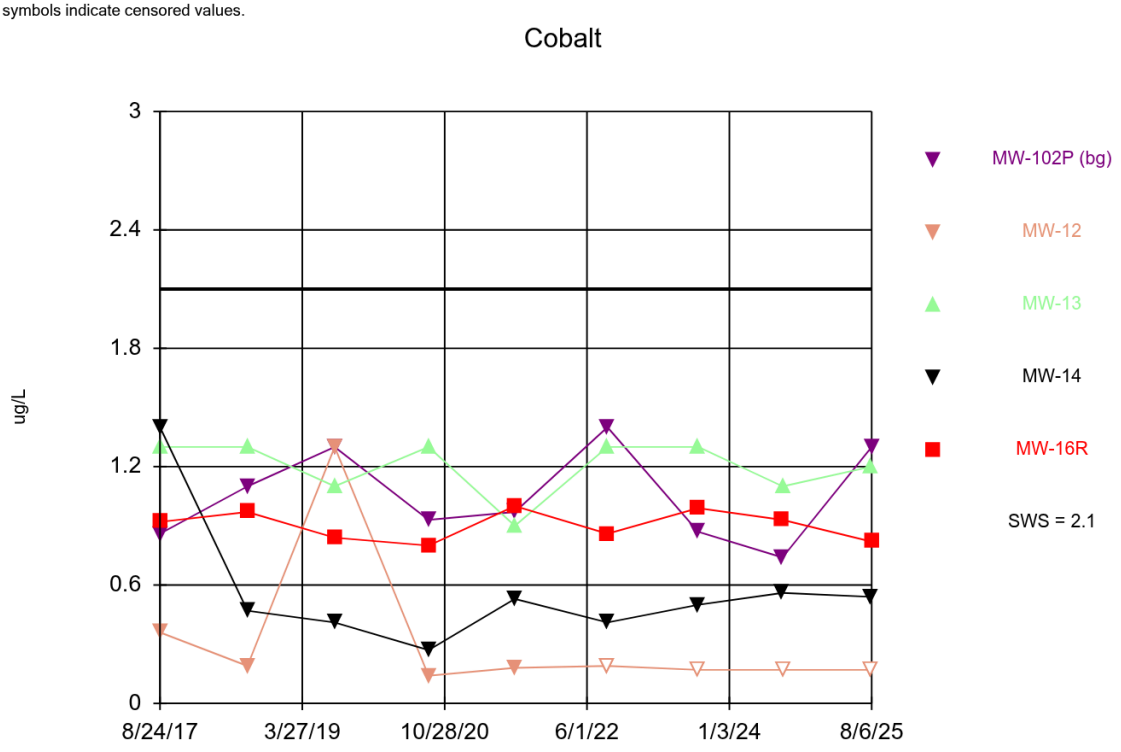

Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	0.86 (J)	0.36 (J)	1.3	1.4	0.92 (J)
8/16/2018	1.1	0.19 (J)	1.3	0.47 (J)	0.97 (J)
8/7/2019	1.3 (J)	1.3	1.1	0.41 (J)	0.84
8/24/2020	0.93	0.14 (J)	1.3	0.27 (J)	
8/25/2020					0.8
8/10/2021		0.18 (J)			
8/11/2021	0.97		0.9	0.53	1
8/24/2022	1.4	<0.19 (U)	1.3	0.41 (J)	0.86
8/29/2023	0.87	<0.17 (U)			0.99
8/30/2023			1.3	0.5	
8/7/2024	0.74			0.56	0.93
8/8/2024		<0.17	1.1		
8/5/2025		<0.17 (U)	1.2	0.54	
8/6/2025	1.3				0.82

ND substitution: RL or RL/2 if <15% NDs.

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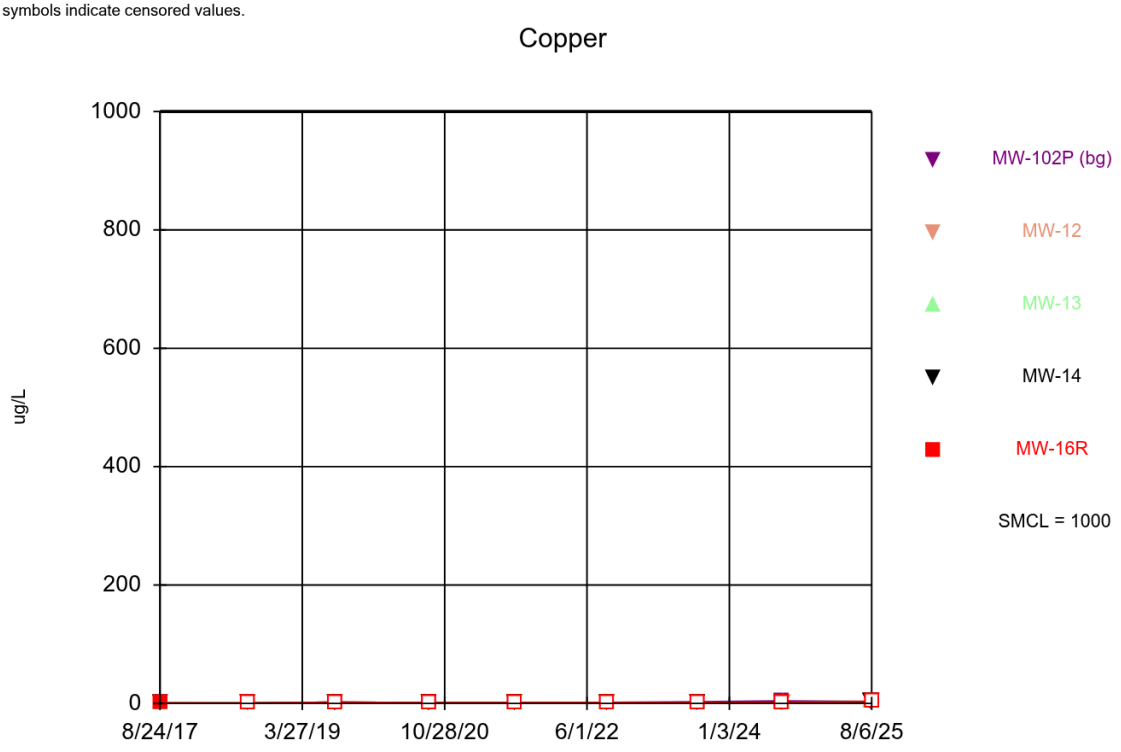
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Copper (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	0.23 (J)	0.94 (J)	0.62 (J)	0.54 (J)	0.97 (J)
8/16/2018	<0.48	<0.48	<0.48	0.6 (J)	<0.48
8/7/2019	<2	<2	<2	<2	<2
8/24/2020	<1.5	<1.5	<1.5	<1.5	
8/25/2020					<1.5
8/10/2021		<1.4			
8/11/2021	<1.4		<1.4	<1.4	<1.4
8/24/2022	<1.8 (U)	<1.8 (U)	<1.8 (U)	<1.8 (U)	<1.8 (U)
8/29/2023	2.7 (J)	<1.8 (U)			<1.8 (U)
8/30/2023			<1.8 (U)	<1.8 (U)	
8/7/2024	4.3 (J)			2.1 (J)	<1.8
8/8/2024		<1.8	<1.8		
8/5/2025		3.8 (J)	<3.2 (U)	<3.2 (U)	
8/6/2025	<3.2 (U)				<3.2 (U)

ND substitution: RL or RL/2 if <15% NDs.

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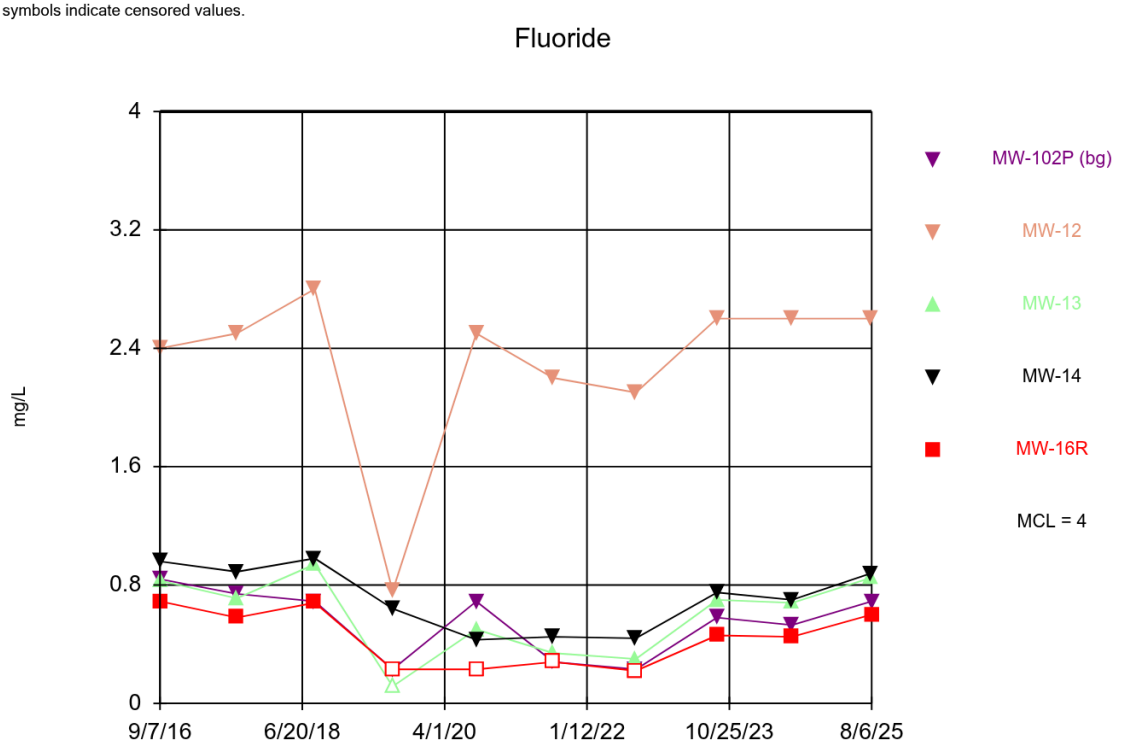
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
9/7/2016	0.84	2.4	0.83	0.96	0.69
8/24/2017	0.74	2.5	0.71	0.89	0.58
8/16/2018	0.69	2.8	0.94	0.98	0.68
8/7/2019	<0.23	0.76	<0.23	0.64	<0.23
8/24/2020	0.69	2.5	0.5	0.43 (J)	
8/25/2020					<0.23
8/10/2021		2.2			
8/11/2021	<0.28		0.34 (J)	0.45 (J)	<0.28
8/24/2022	0.23 (J)	2.1	0.3 (J)	0.44 (J)	<0.22 (U)
8/29/2023	0.58 (J)	2.6			0.46 (J)
8/30/2023			0.7 (J)	0.75 (J)	
8/7/2024	0.53 (J)			0.7 (J)	0.45 (J)
8/8/2024		2.6	0.68 (J)		
8/5/2025		2.6	0.85 (J)	0.88 (J)	
8/6/2025	0.69 (J)				0.6 (J)

ND substitution: RL or RL/2 if <15% NDs.

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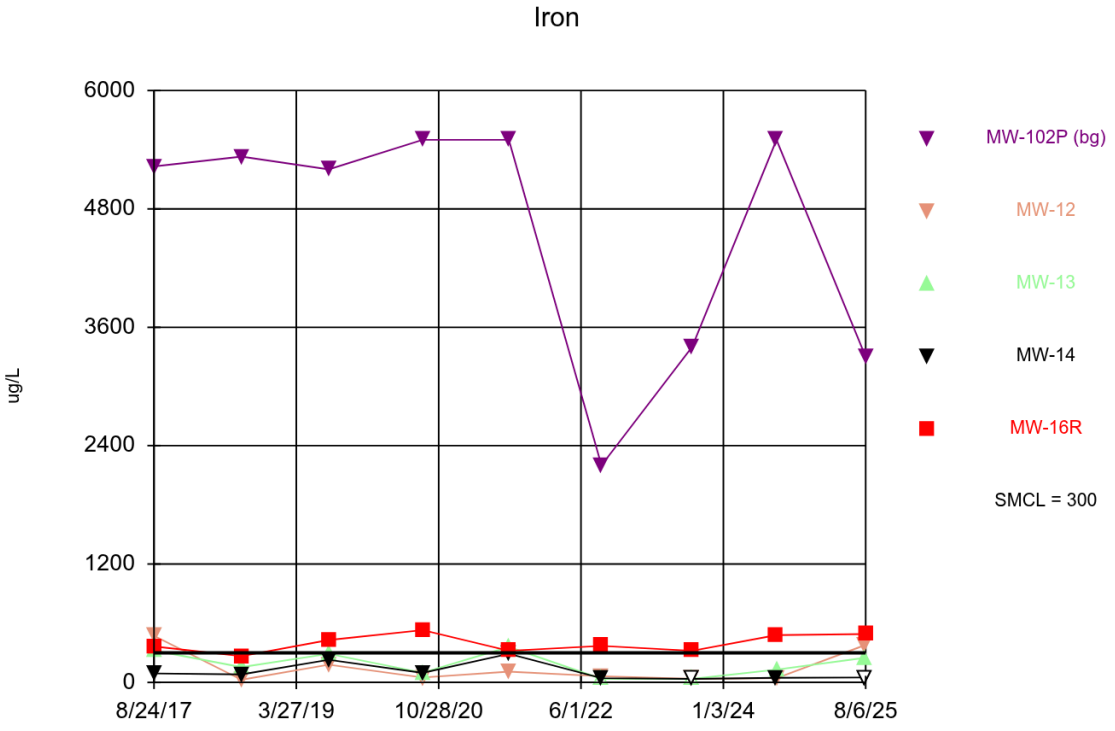
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Iron (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	5230	473	324	91.5	365
8/16/2018	5330	27.1 (J)	155	81.8	266
8/7/2019	5200	180	290	230	430
8/24/2020	5500	<50	98 (J)	97 (J)	
8/25/2020					530
8/10/2021		110			
8/11/2021	5500		360	290	320
8/24/2022	2200	63 (J)	<36 (U)	43 (J)	370
8/29/2023	3400	<36 (U)			320
8/30/2023			<36 (U)	<36 (U)	
8/7/2024	5500			47 (J)	480
8/8/2024		43 (J)	130		
8/5/2025		380	250	<50 (U)	
8/6/2025	3300				490

ND substitution: RL or RL/2 if <15% NDs.

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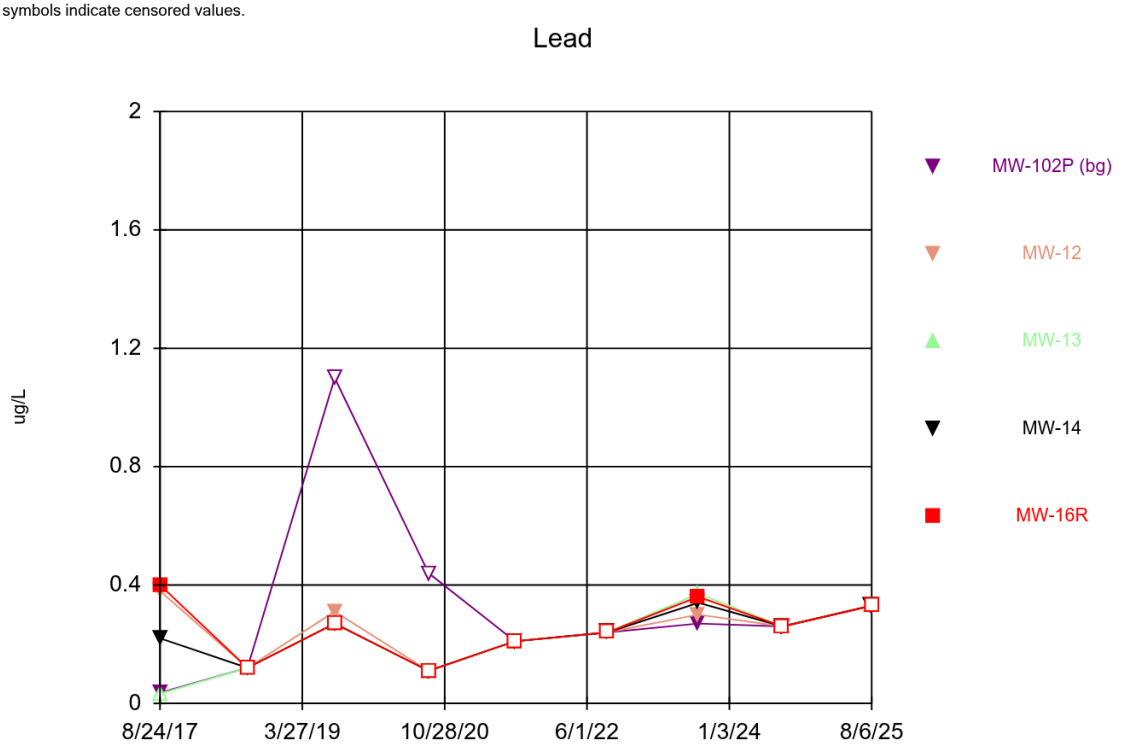
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

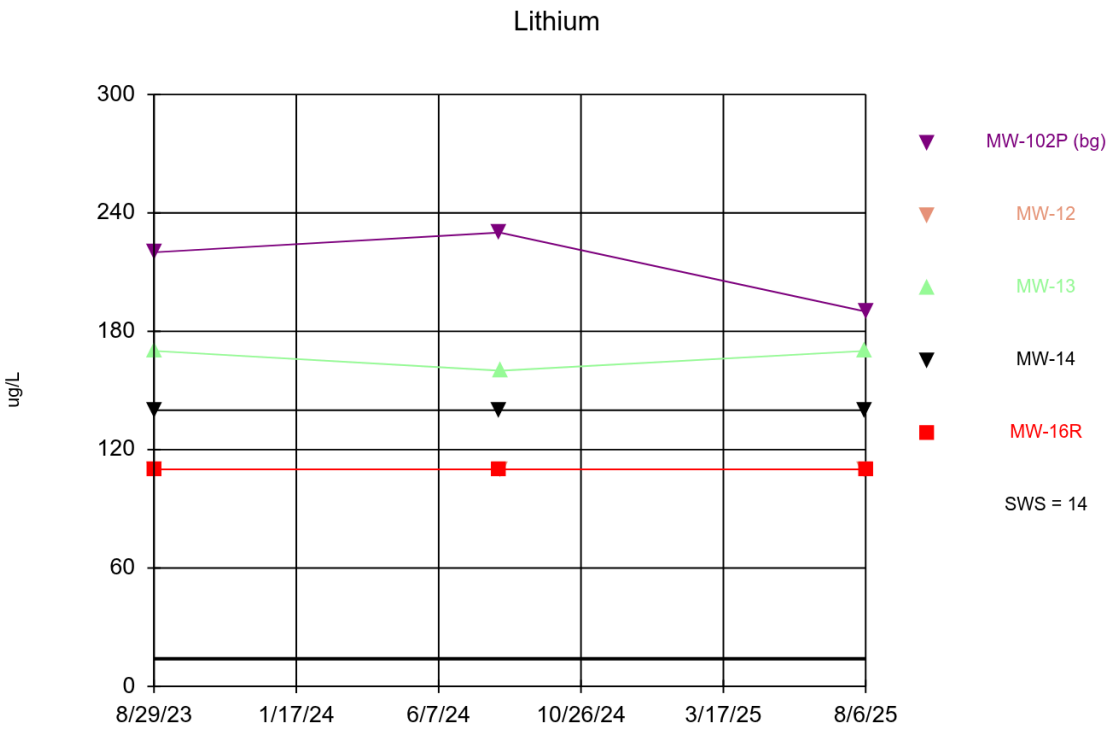
Time Series

Constituent: Lead (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	0.036 (J)	0.38 (J)	<0.033	0.22 (J)	0.4 (J)
8/16/2018	<0.12	<0.12	<0.12	0.12 (J)	<0.12
8/7/2019	<1.1	0.31 (J)	<0.27	<0.27	<0.27
8/24/2020	<0.44	<0.11	<0.11	<0.11	
8/25/2020					<0.11
8/10/2021		0.21 (J)			
8/11/2021	<0.21		<0.21	<0.21	<0.21
8/24/2022	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)
8/29/2023	0.27 (JB)	0.3 (JB)			0.36 (JB)
8/30/2023			0.37 (JB)	0.34 (JB)	
8/7/2024	<0.26			<0.26	<0.26
8/8/2024		<0.26	<0.26		
8/5/2025		<0.33 (U)	<0.33 (U)	<0.33 (U)	
8/6/2025	<0.33 (U)				<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.

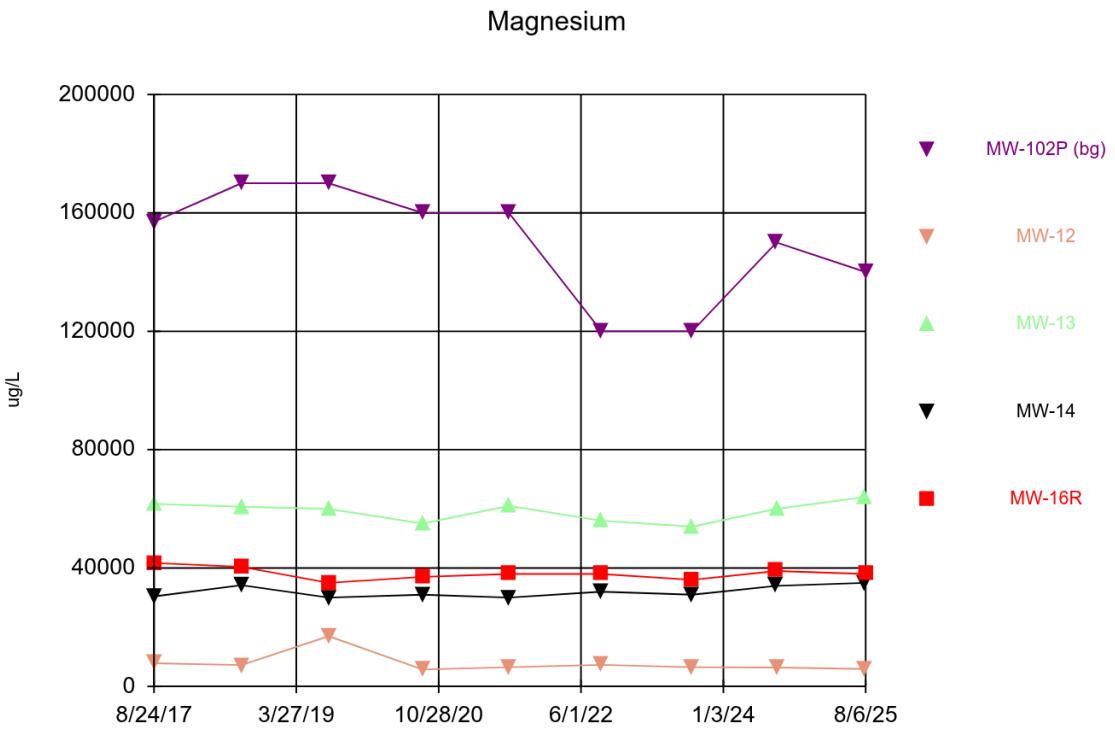


Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Lithium (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/29/2023	220	110			110
8/30/2023			170	140	
8/7/2024	230			140	110
8/8/2024		110	160		
8/5/2025		110	170	140	
8/6/2025	190				110



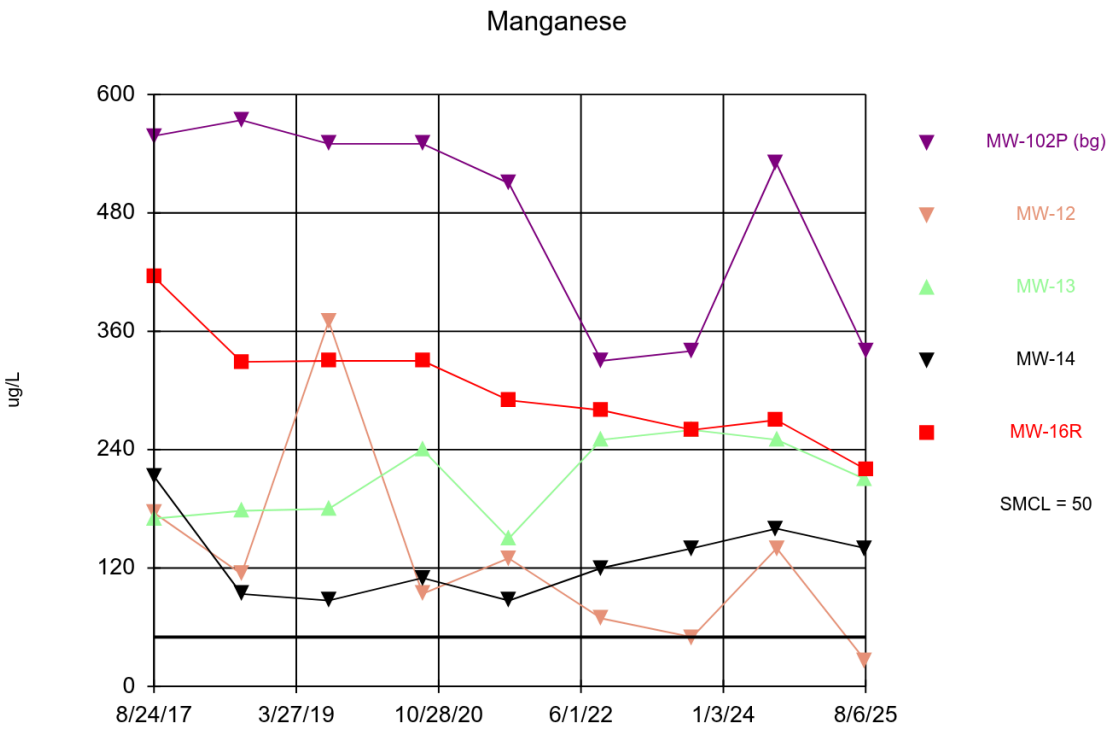
Time Series Analysis Run 10/7/2025 9:40 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	157000	7830	61700	30400	41700
8/16/2018	170000	7230	60700	34200	40400
8/7/2019	170000	17000	60000	30000	35000
8/24/2020	160000	5700	55000	31000	
8/25/2020					37000
8/10/2021		6500			
8/11/2021	160000		61000	30000	38000
8/24/2022	120000	7300	56000	32000	38000
8/29/2023	120000	6500			36000
8/30/2023			54000	31000	
8/7/2024	150000			34000	39000
8/8/2024		6400	60000		
8/5/2025		5900	64000	35000	
8/6/2025	140000				38000



Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	558	176	170	213	415
8/16/2018	574	114	178	93.7	329
8/7/2019	550	370	180	87	330
8/24/2020	550	94	240	110	
8/25/2020					330
8/10/2021		130			
8/11/2021	510		150	87	290
8/24/2022	330	69	250	120	280
8/29/2023	340	50			260
8/30/2023			260	140	
8/7/2024	530			160	270
8/8/2024		140	250		
8/5/2025		26	210	140	
8/6/2025	340				220

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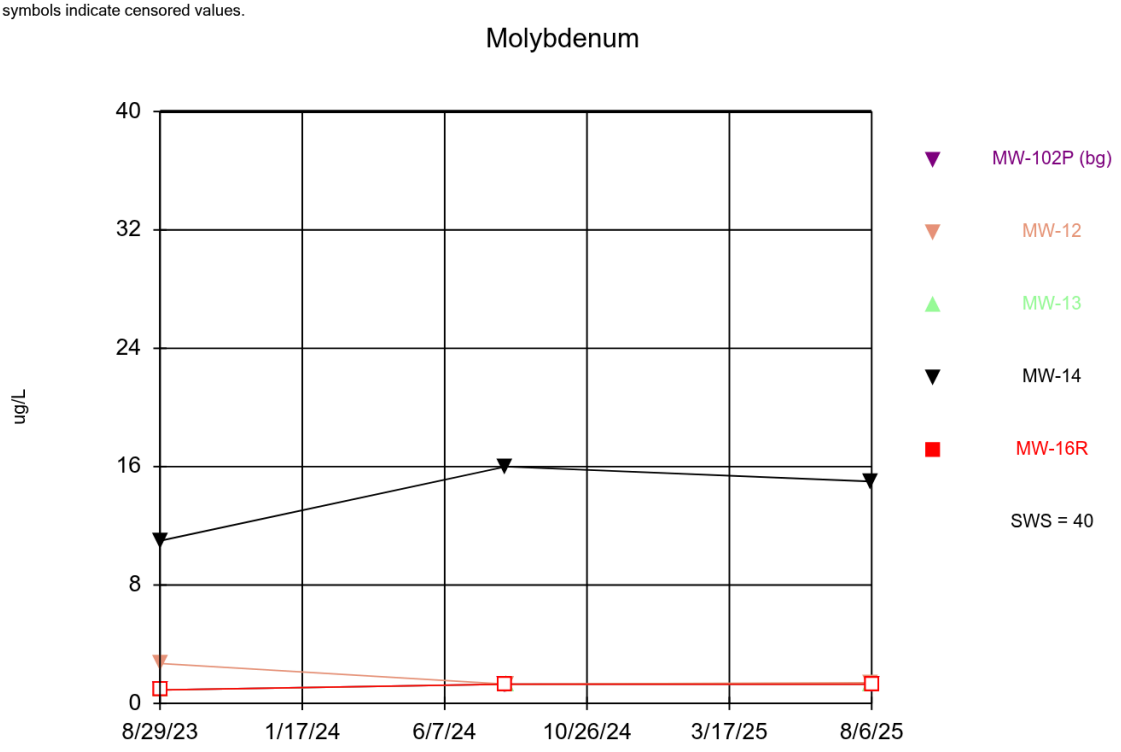

Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Molybdenum (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/29/2023	<0.91 (U)	2.7			<0.91 (U)
8/30/2023			<0.91 (U)	11	
8/7/2024	<1.3			16	<1.3
8/8/2024		<1.3	<1.3		
8/5/2025		1.4 (J)	<1.3 (U)	15	
8/6/2025	<1.3 (U)				<1.3 (U)

ND substitution: RL or RL/2 if <15% NDs.

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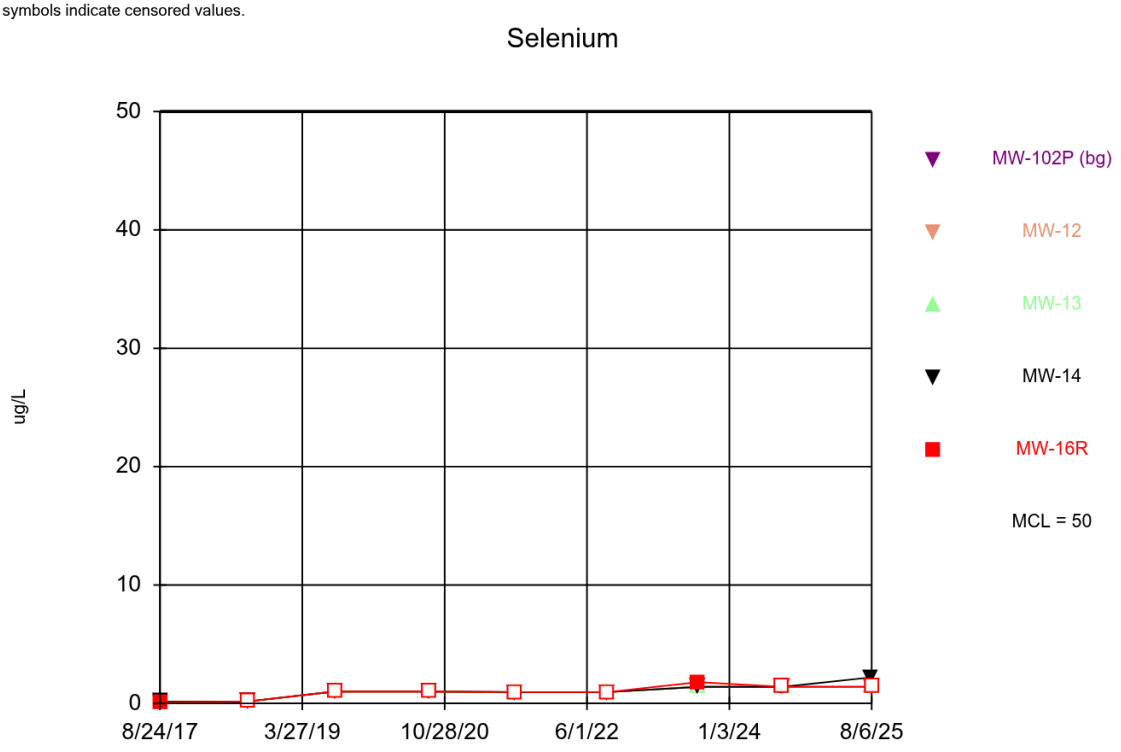
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

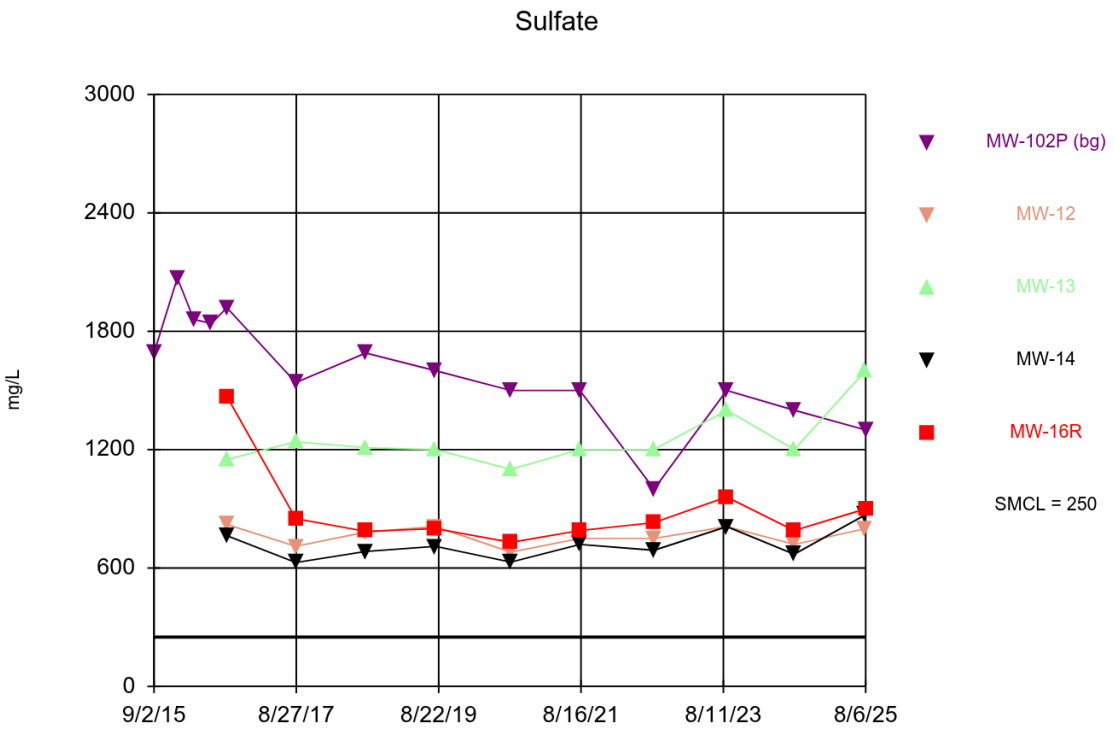
Time Series

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	<0.086	<0.086	<0.086	0.16 (J)	0.099 (J)
8/16/2018	<0.16	<0.16	<0.16	<0.16	<0.16
8/7/2019	<1	<1	<1	<1	<1
8/24/2020	<1	<1	<1	<1	
8/25/2020					<1
8/10/2021		<0.96			
8/11/2021	<0.96		<0.96	<0.96	<0.96
8/24/2022	<0.96 (U)	<0.96 (U)	<0.96 (U)	<0.96 (U)	<0.96 (U)
8/29/2023	<1.4 (U)	1.4 (J)			1.8 (J)
8/30/2023			<1.4 (U)	<1.4 (U)	
8/7/2024	<1.4			<1.4	<1.4
8/8/2024		<1.4	<1.4		
8/5/2025		<1.4 (U)	<1.4 (U)	2.2 (J)	
8/6/2025	<1.4 (U)				<1.4 (U)

ND substitution: RL or RL/2 if <15% NDs.



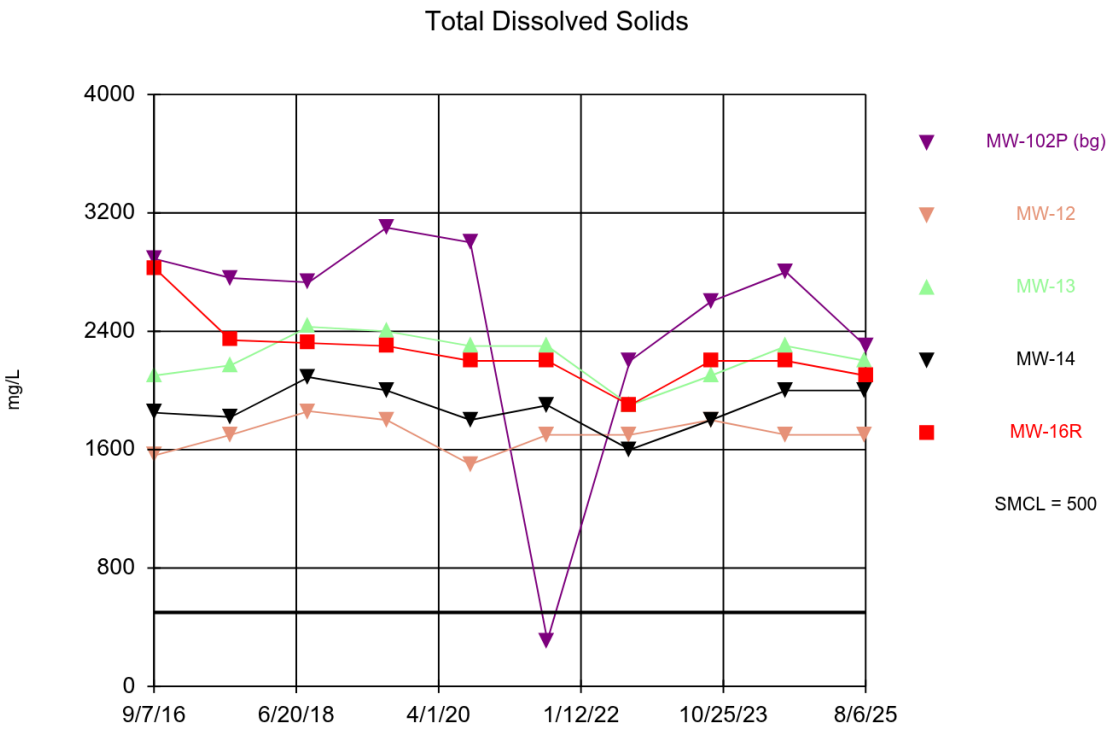
Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
9/2/2015	1690				
12/30/2015	2070				
3/23/2016	1860				
6/21/2016	1840				
9/7/2016	1920	821	1150	764	1470
8/24/2017	1540	710	1240	628	850
8/16/2018	1690	782	1210	684	786
8/7/2019	1600	810	1200	710	800
8/24/2020	1500	680	1100	630	
8/25/2020					730
8/10/2021		750			
8/11/2021	1500		1200	720	790
8/24/2022	1000	750	1200	690	830
8/29/2023	1500	810			960
8/30/2023			1400	810	
8/7/2024	1400			670	790
8/8/2024		720	1200		
8/5/2025		800	1600	870	
8/6/2025	1300				900



Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
9/7/2016	2890	1560	2100	1850	2830
8/24/2017	2760	1700	2170	1820	2340
8/16/2018	2730	1860	2430	2090	2320
8/7/2019	3100	1800	2400	2000	2300
8/24/2020	3000	1500	2300	1800	
8/25/2020					2200
8/10/2021		1700			
8/11/2021	310 (X)		2300	1900	2200
8/24/2022	2200	1700	1900	1600	1900
8/29/2023	2600	1800			2200
8/30/2023			2100	1800	
8/7/2024	2800			2000	2200
8/8/2024		1700	2300		
8/5/2025		1700	2200	2000	
8/6/2025	2300				2100

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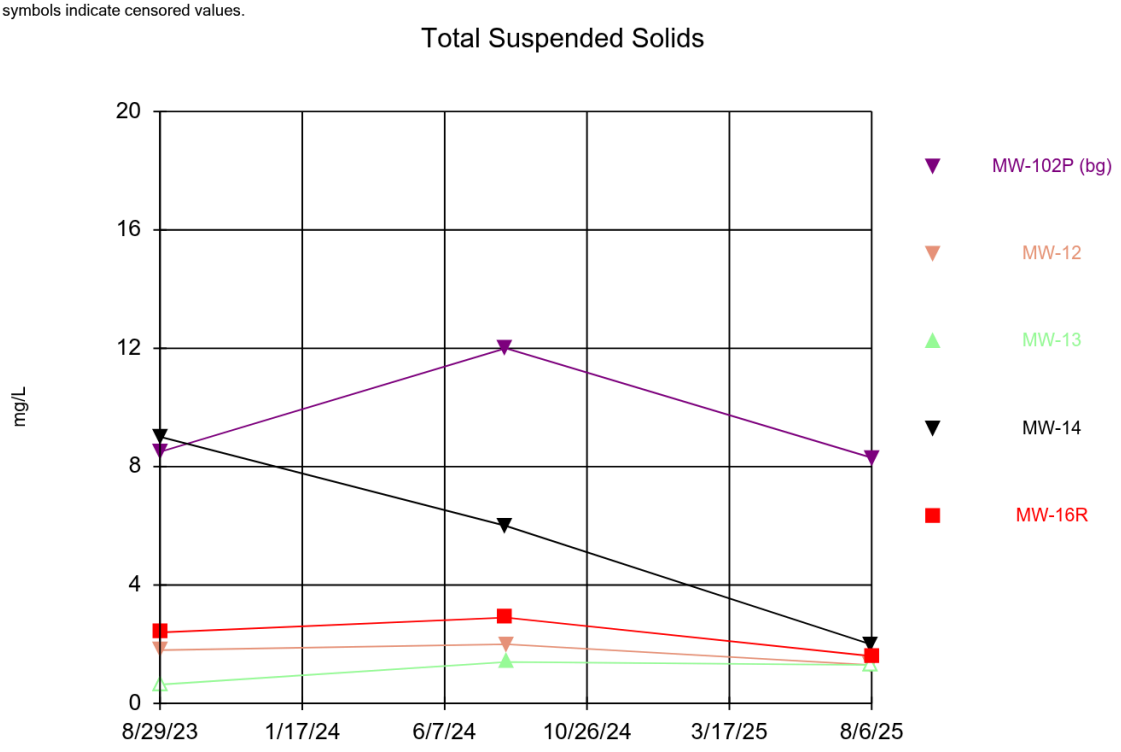
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Total Suspended Solids (mg/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/29/2023	8.5	1.8 (J)			2.4
8/30/2023			<0.64 (U)	9	
8/7/2024	12			6	2.9
8/8/2024		2	1.4 (J)		
8/5/2025		<1.3 (U)	<1.3 (U)	2	
8/6/2025	8.3				1.6 (J)

ND substitution: RL or RL/2 if <15% NDs.

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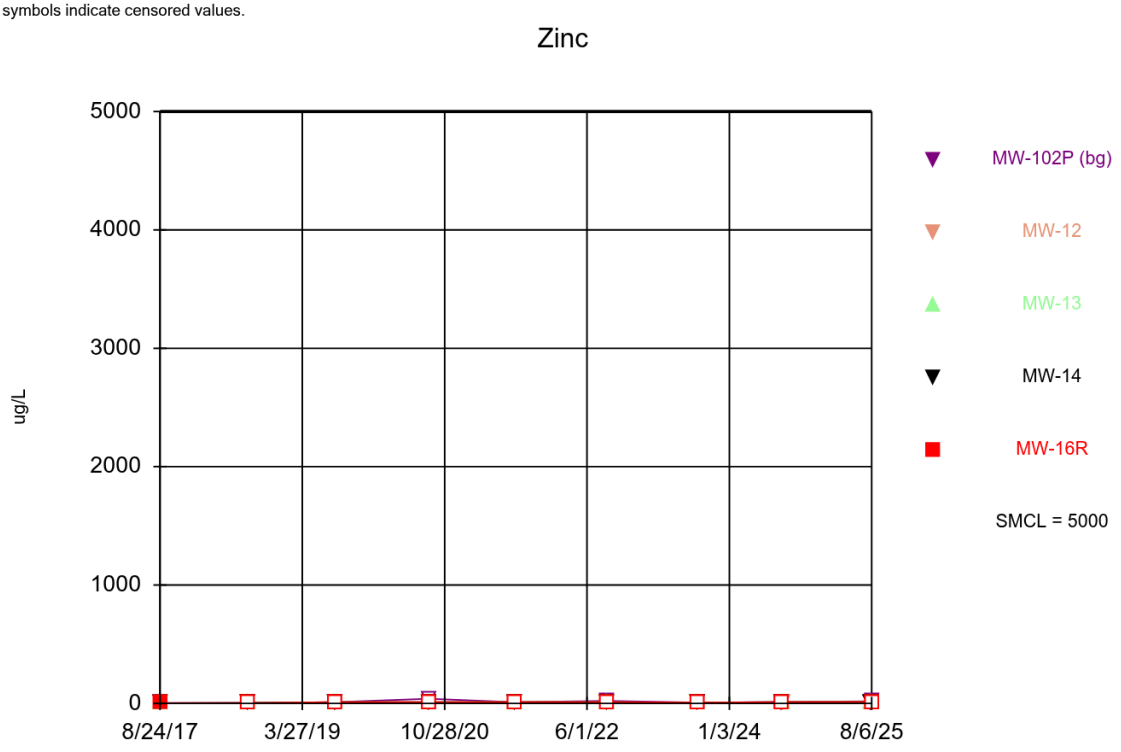
Hollow symbols indicate censored values.



Time Series Analysis Run 10/7/2025 9:41 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Time Series

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 9:42 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-12	MW-13	MW-14	MW-16R
8/24/2017	3.6 (J)	3.7 (J)	2 (J)	1.7 (J)	1 (J)
8/16/2018	4.3 (J)	<3.7	<3.7	<3.7	<3.7
8/7/2019	<10	<10	<10	<10	<10
8/24/2020	<40	<10	<10	<10	
8/25/2020					<10
8/10/2021		<10			
8/11/2021	<10		<10	<10	<10
8/24/2022	21	<10 (U)	<10 (U)	<10 (U)	<10 (U)
8/29/2023	6.9 (J)	<6.4 (U)			<6.4 (U)
8/30/2023			<6.4 (U)	<6.4 (U)	
8/7/2024	12 (J)			<9.7	<9.7
8/8/2024		<9.7	<9.7		
8/5/2025		<13 (U)	<13 (U)	<13 (U)	
8/6/2025	18 (J)				<13 (U)

ND substitution: RL or RL/2 if <15% NDs.

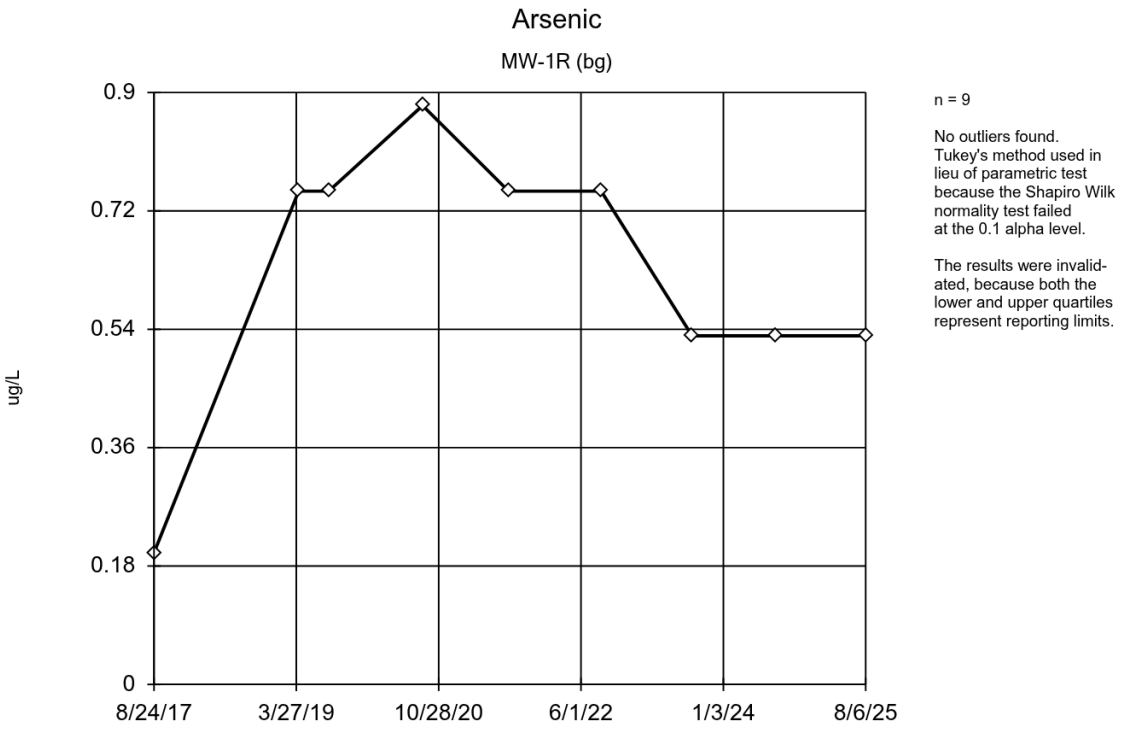
Attachment D3

Outlier Analysis - Shallow

Outlier Analysis

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 9:59 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Arsenic (ug/L)	MW-1R (bg)	n/a	n/a	n/a	NP (nrm)	NaN	9	0.63	0.2046	unknown	ShapiroWilk
Barium (ug/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	9	72.78	6.058	normal	ShapiroWilk
Beryllium (ug/L)	MW-1R (bg)	n/a	n/a	n/a	NP (nrm)	NaN	9	0.2691	0.1065	unknown	ShapiroWilk
Boron (ug/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	9	83.44	18.88	normal	ShapiroWilk
Chloride (mg/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	37	88.8	95.06	ln(x)	ShapiroWilk
Cobalt (ug/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	9	0.169	0.09355	normal	ShapiroWilk
Copper (ug/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	9	1.854	0.6041	normal	ShapiroWilk
Fluoride (mg/L)	**MW-1R (bg)**	**Yes**	**0.11**	**8/23/2022**	**Dixon`s**	**0.05**	**10**	**0.457**	**0.1899**	**ln(x)**	**ShapiroWilk**
Iron (ug/L)	**MW-1R (bg)**	**Yes**	**380**	**4/6/2019**	**Dixon`s**	**0.05**	**9**	**86.5**	**112.1**	**normal**	**ShapiroWilk**
Lead (ug/L)	MW-1R (bg)	No	n/a	n/a	NP (nrm)	NaN	9	0.3767	0.2512	unknown	ShapiroWilk
Magnesium (ug/L)	**MW-1R (bg)**	**Yes**	**48100**	**8/24/2017**	**NP (nrm)**	**NaN**	**9**	**32122**	**6084**	**unknown**	**ShapiroWilk**
Manganese (ug/L)	**MW-1R (bg)**	**Yes**	**20**	**4/6/2019**	**Dixon`s**	**0.05**	**9**	**5.367**	**5.544**	**normal**	**ShapiroWilk**
Selenium (ug/L)	MW-1R (bg)	No	n/a	n/a	EPA 1989	0.05	9	1.462	0.5453	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-1R (bg)	No	n/a	n/a	NP (nrm)	NaN	27	214.8	120.9	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1R (bg)	No	n/a	n/a	NP (nrm)	NaN	10	561.5	165.5	unknown	ShapiroWilk
Zinc (ug/L)	MW-1R (bg)	No	n/a	n/a	NP (nrm)	NaN	9	9.056	2.995	unknown	ShapiroWilk



n = 9

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

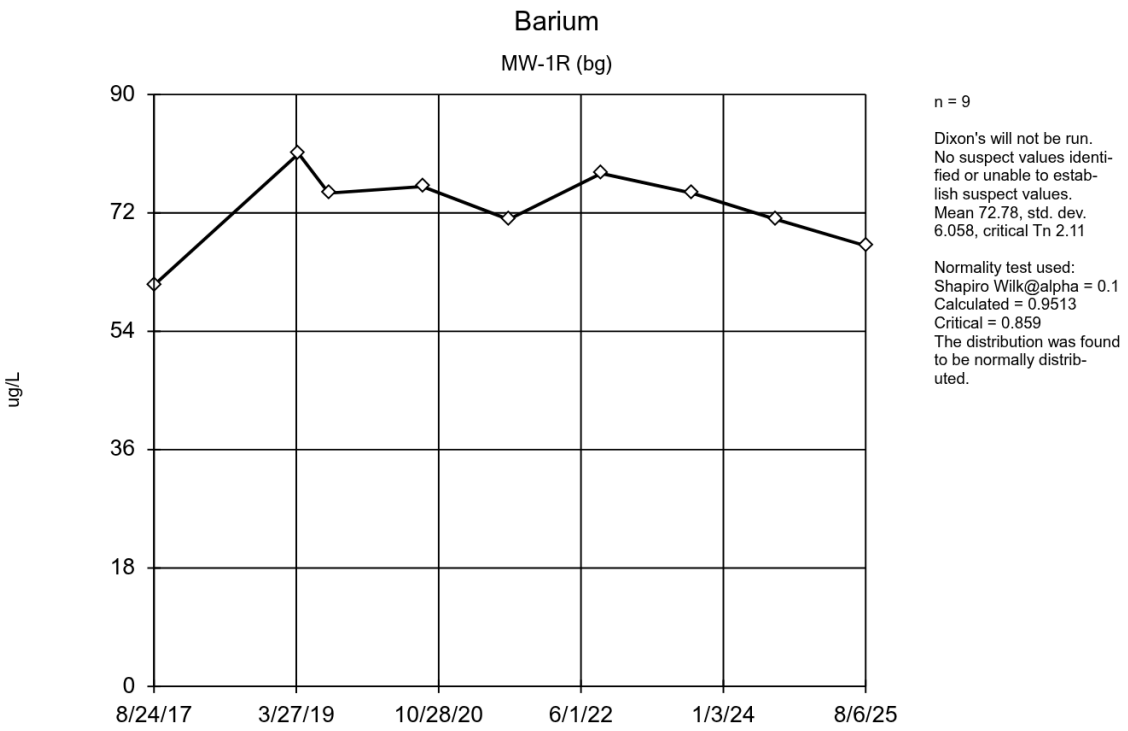
Tukey's Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	0.2 (J)
4/6/2019	<0.75
8/7/2019	<0.75
8/24/2020	<0.88
8/10/2021	<0.75
8/23/2022	<0.75 (U)
8/29/2023	<0.53 (U)
8/6/2024	<0.53
8/6/2025	<0.53 (U)

ND substitution: RL or RL/2 if <15% NDs.



EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

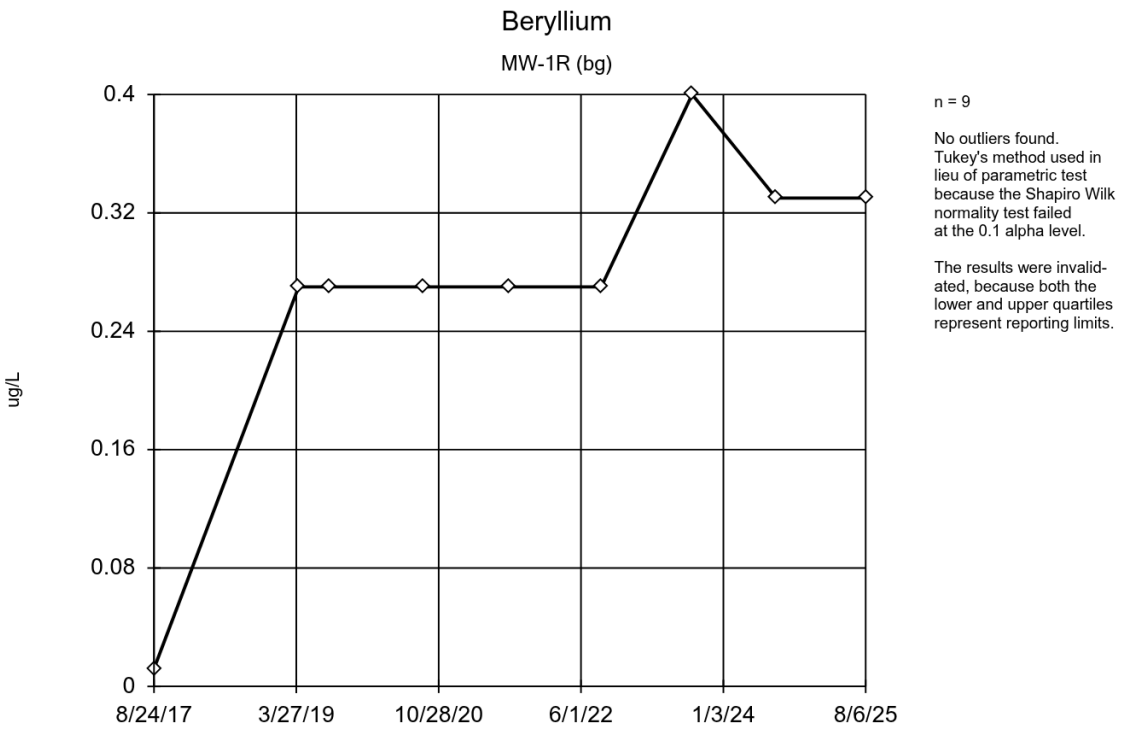
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Barium (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	61
4/6/2019	81
8/7/2019	75
8/24/2020	76
8/10/2021	71 (B)
8/23/2022	78
8/29/2023	75
8/6/2024	71
8/6/2025	67



n = 9

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

The results were invalid-ated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

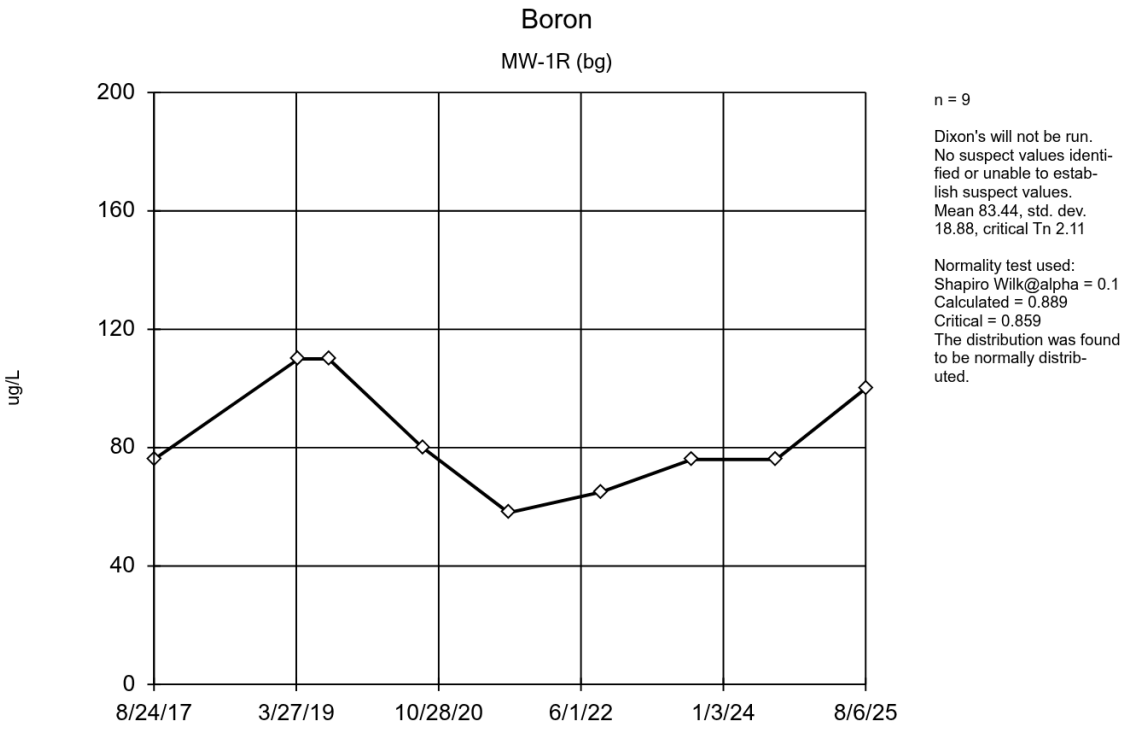
Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	<0.012
4/6/2019	<0.27
8/7/2019	<0.27
8/24/2020	<0.27
8/10/2021	<0.27
8/23/2022	<0.27 (U)
8/29/2023	0.4 (J)
8/6/2024	<0.33
8/6/2025	<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.



EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

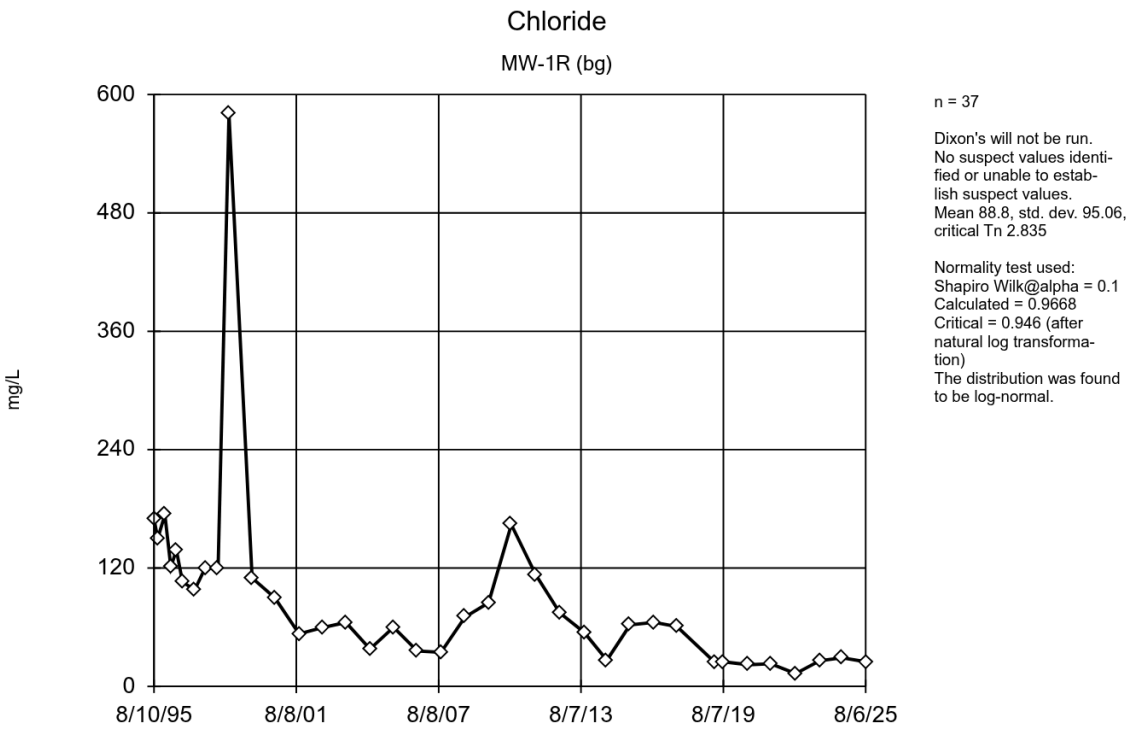
EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	76 (J)
4/6/2019	110 (J)
8/7/2019	110 (J,B)
8/24/2020	<80
8/10/2021	<58
8/23/2022	65 (J)
8/29/2023	<76 (U)
8/6/2024	<76
8/6/2025	100

ND substitution: RL or RL/2 if <15% NDs.



n = 37

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 88.8, std. dev. 95.06, critical Tn 2.835

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9668
Critical = 0.946 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

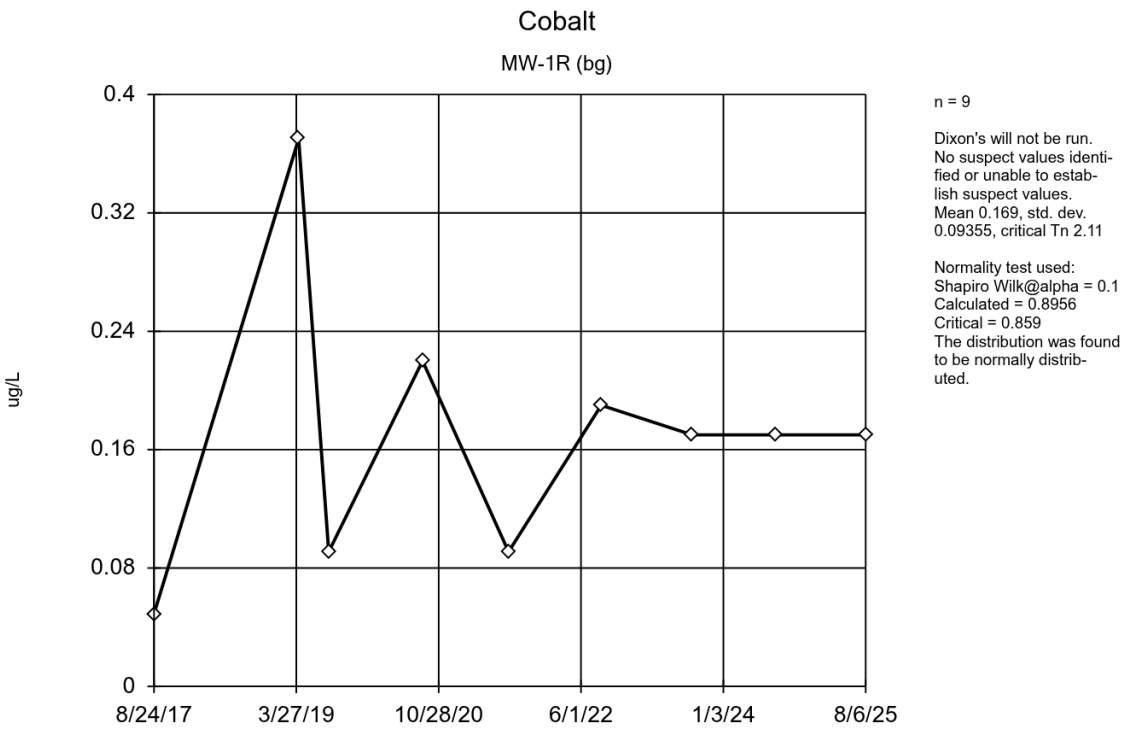
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/10/1995	170
10/6/1995	150
1/25/1996	174
4/26/1996	121
7/19/1996	138.3
10/21/1996	106
4/28/1997	98
10/6/1997	120
4/22/1998	120
10/7/1998	580 (X)
9/29/1999	110
9/13/2000	89.6
9/19/2001	53.3
9/11/2002	59.5
9/10/2003	64.8
9/15/2004	37.9
9/14/2005	60
9/13/2006	35.9
9/12/2007	34.5
9/17/2008	70.4
9/16/2009	84.9
8/31/2010	164
9/13/2011	113
9/18/2012	74.4
9/27/2013	54.7
9/10/2014	26.6
9/2/2015	62.4
9/7/2016	64.9
8/24/2017	60.6
4/6/2019	24
8/7/2019	25
8/24/2020	22
8/10/2021	23
8/23/2022	13
8/29/2023	26
8/6/2024	29
8/6/2025	25



EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

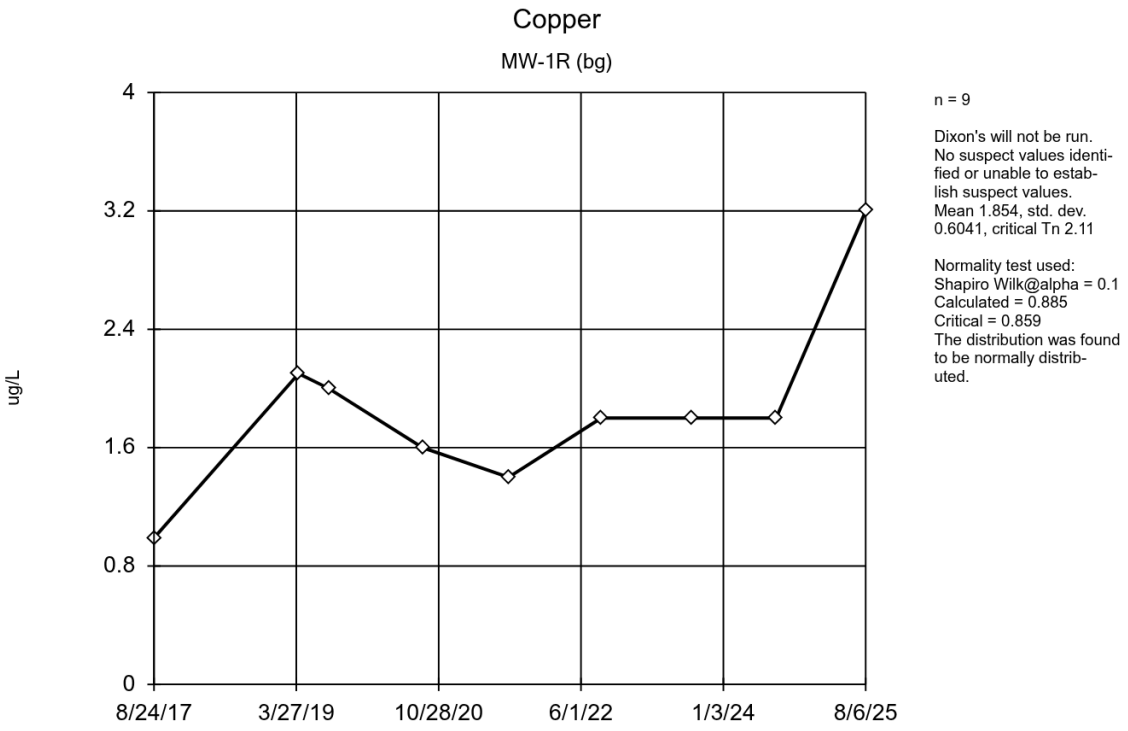
EPA 1989 Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	0.049 (J)
4/6/2019	0.37 (J)
8/7/2019	<0.091
8/24/2020	0.22 (J)
8/10/2021	<0.091
8/23/2022	<0.19 (U)
8/29/2023	<0.17 (U)
8/6/2024	<0.17
8/6/2025	<0.17 (U)

ND substitution: RL or RL/2 if <15% NDs.



EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

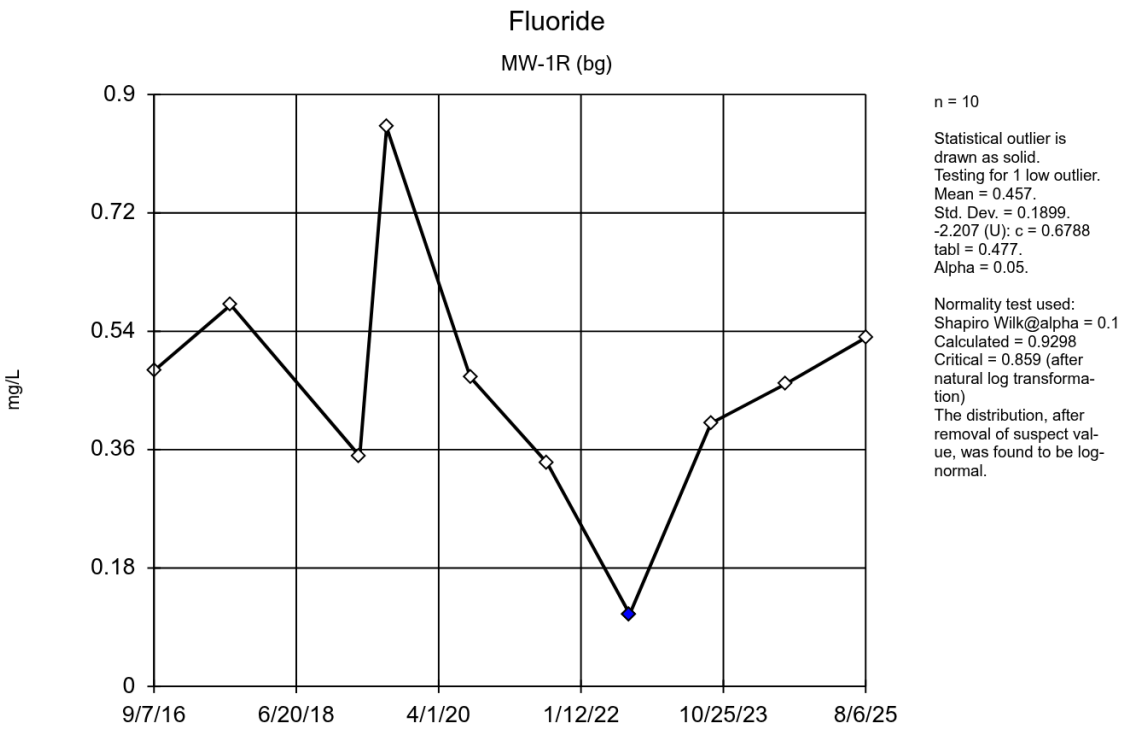
EPA 1989 Outlier Screening

Constituent: Copper (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	0.99 (J)
4/6/2019	2.1 (J)
8/7/2019	<2
8/24/2020	1.6 (J)
8/10/2021	<1.4
8/23/2022	<1.8 (U)
8/29/2023	<1.8 (U)
8/6/2024	<1.8
8/6/2025	<3.2 (U)

ND substitution: RL or RL/2 if <15% NDs.



n = 10

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 0.457.
Std. Dev. = 0.1899.
-2.207 (U): c = 0.6788
tabl = 0.477.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9298
Critical = 0.859 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Dixon's Outlier Test Analysis Run 10/7/2025 9:57 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

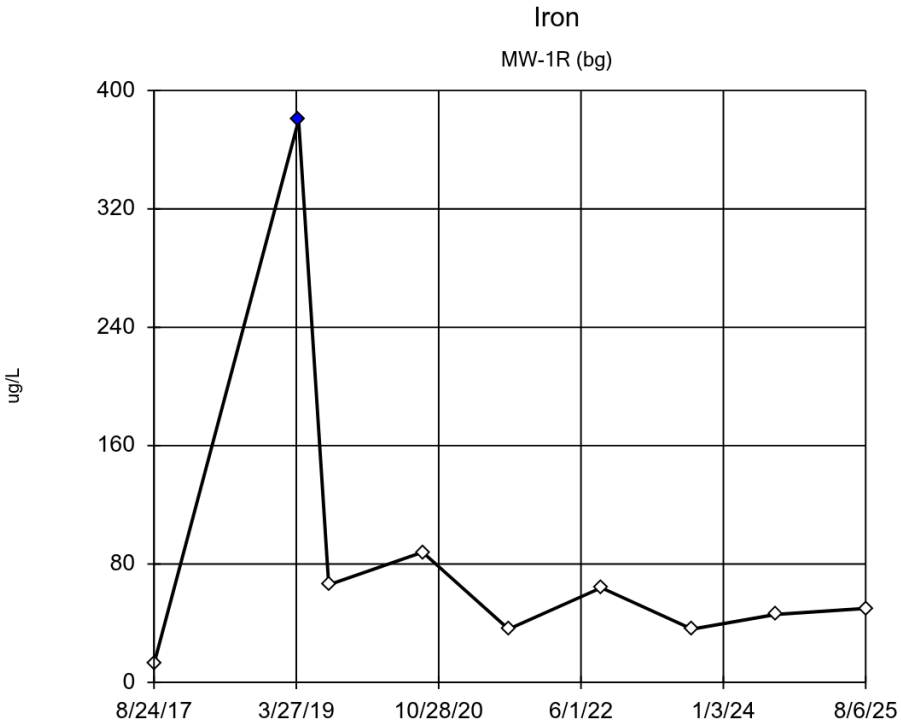
Dixon's Outlier Test

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
9/7/2016	0.48
8/24/2017	0.58
4/6/2019	0.35 (J)
8/7/2019	0.85
8/24/2020	0.47 (J)
8/10/2021	0.34 (J)
8/23/2022	<0.22 (UO)
8/29/2023	0.4 (J)
8/6/2024	0.46 (J)
8/6/2025	0.53 (J)

ND substitution: RL or RL/2 if <15% NDs.



n = 9

Statistical outlier is drawn as solid.
Testing for 1 high and 1 low outliers.
Mean = 86.5.
Std. Dev. = 112.1.
380: c = 0.8488
tabl = 0.512.
12.5 (J): c = 0.3113
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9148
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

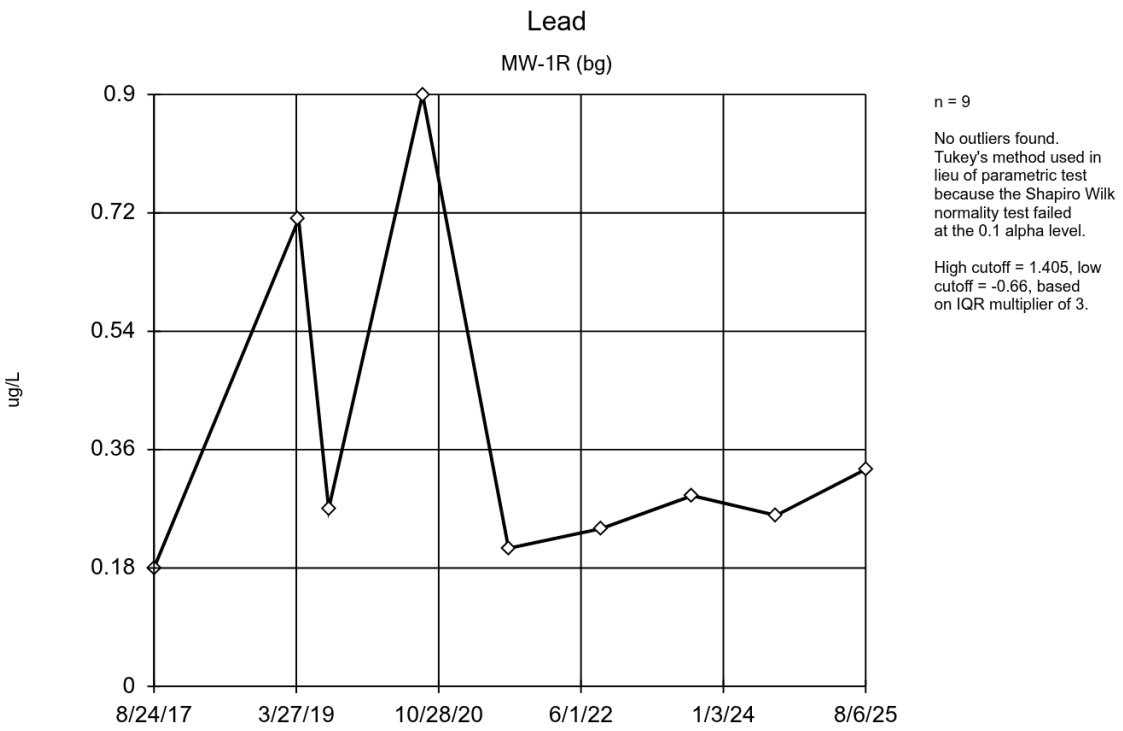
Dixon's Outlier Test

Constituent: Iron (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	12.5 (J)
4/6/2019	380 (O)
8/7/2019	<66
8/24/2020	88 (J)
8/10/2021	<36
8/23/2022	64 (J)
8/29/2023	<36 (U)
8/6/2024	46 (J)
8/6/2025	<50 (U)

ND substitution: RL or RL/2 if <15% NDs.



Tukey's Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

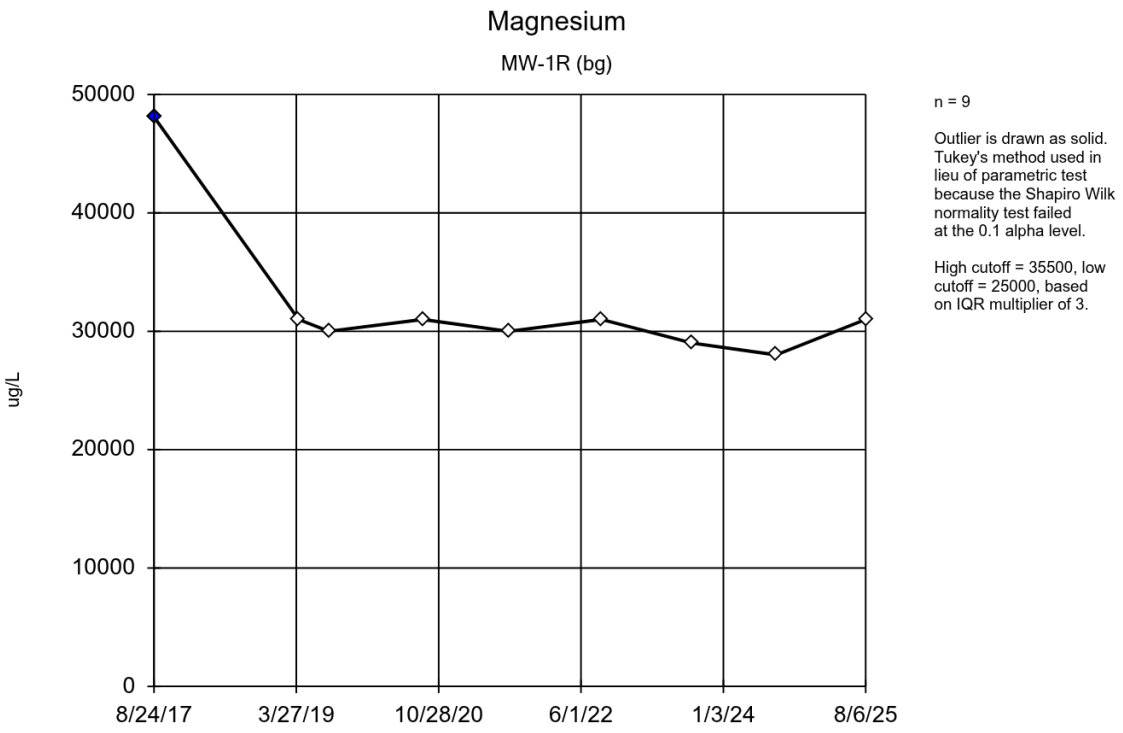
Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	0.18 (J)
4/6/2019	0.71
8/7/2019	<0.27
8/24/2020	0.9
8/10/2021	<0.21
8/23/2022	<0.24 (U)
8/29/2023	0.29 (JB)
8/6/2024	<0.26
8/6/2025	<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.



Tukey's Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

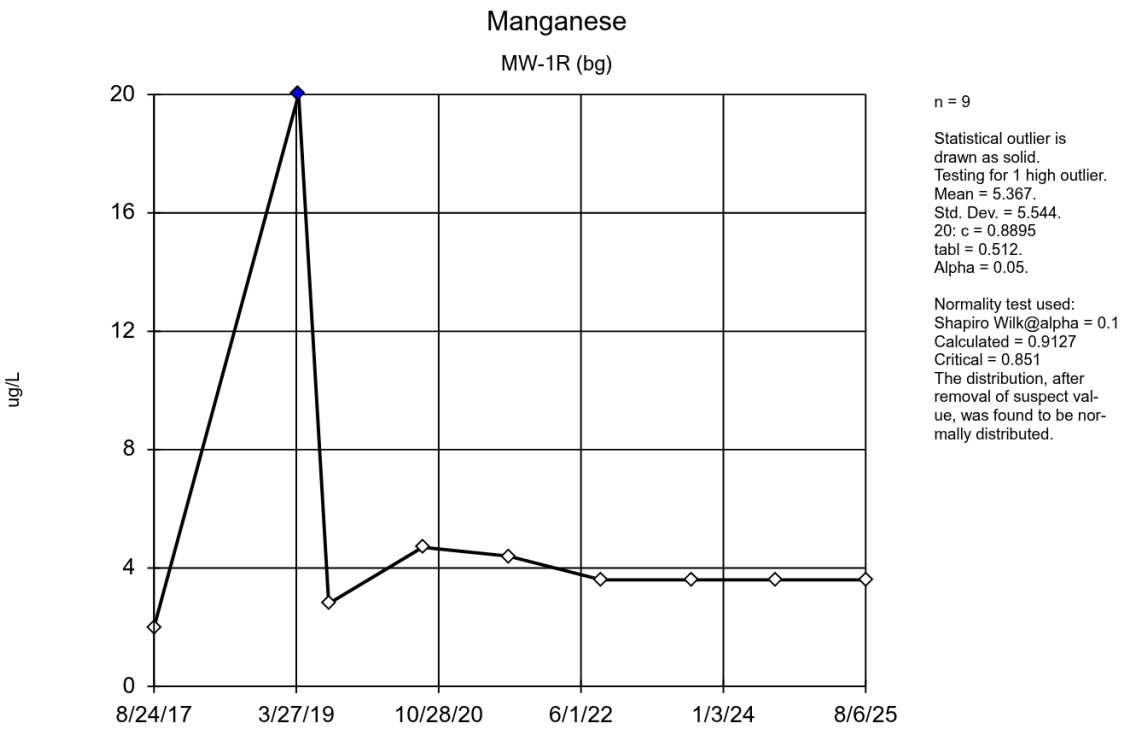
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	48100 (O)
4/6/2019	31000
8/7/2019	30000
8/24/2020	31000
8/10/2021	30000
8/23/2022	31000
8/29/2023	29000
8/6/2024	28000
8/6/2025	31000



Dixon's Outlier Test Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

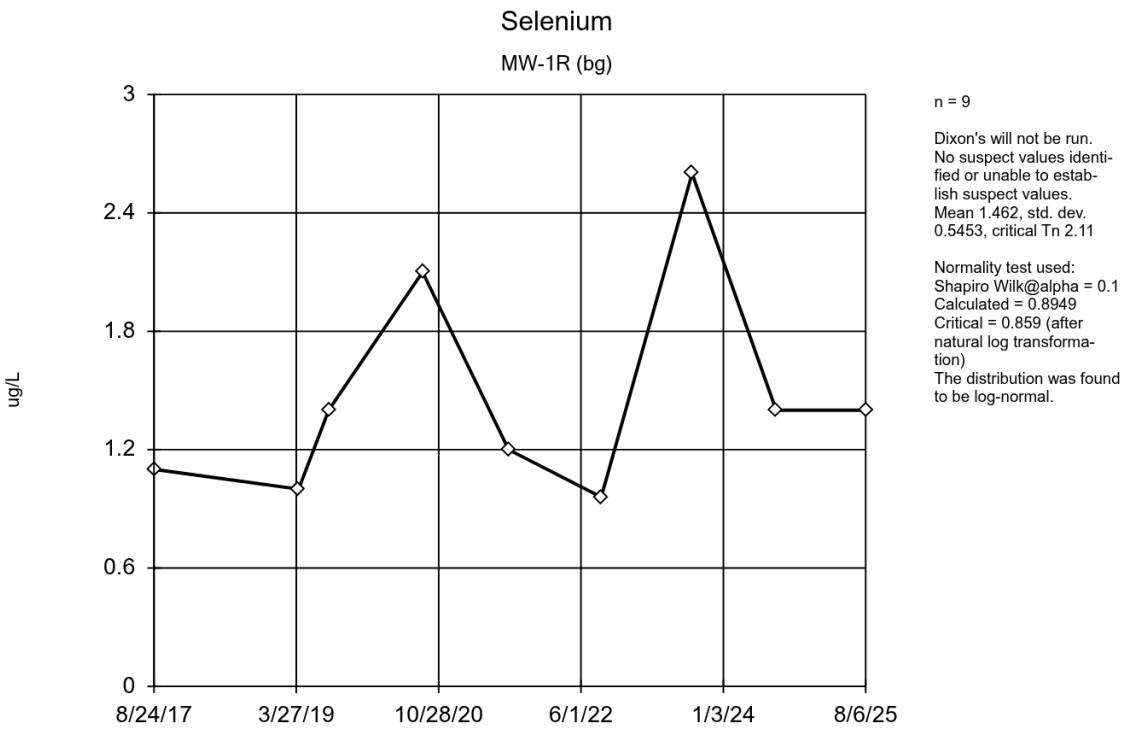
Dixon's Outlier Test

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	2
4/6/2019	20 (O)
8/7/2019	2.8 (J)
8/24/2020	4.7 (J)
8/10/2021	<4.4
8/23/2022	<3.6 (U)
8/29/2023	<3.6 (U)
8/6/2024	<3.6
8/6/2025	<3.6 (U)

ND substitution: RL or RL/2 if <15% NDs.



EPA 1989 Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

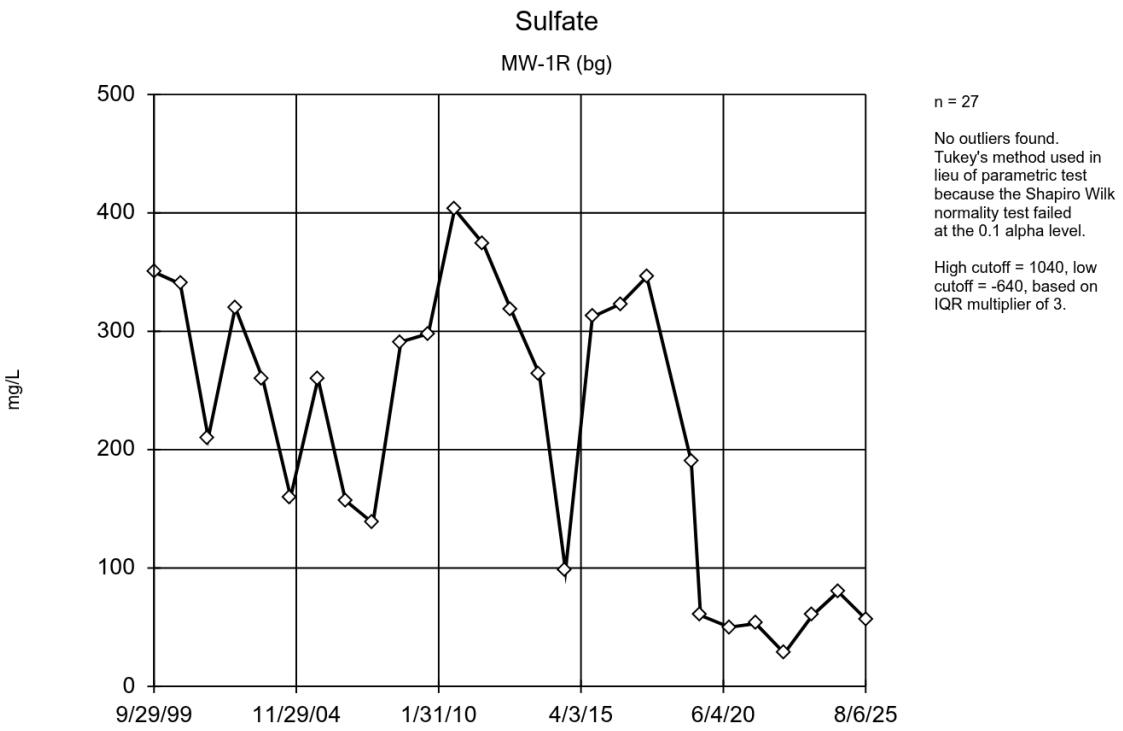
EPA 1989 Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	1.1
4/6/2019	<1
8/7/2019	1.4 (J)
8/24/2020	2.1 (J)
8/10/2021	1.2 (J)
8/23/2022	<0.96 (U)
8/29/2023	2.6 (J)
8/6/2024	<1.4
8/6/2025	1.4 (J)

ND substitution: RL or RL/2 if <15% NDs.



Tukey's Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

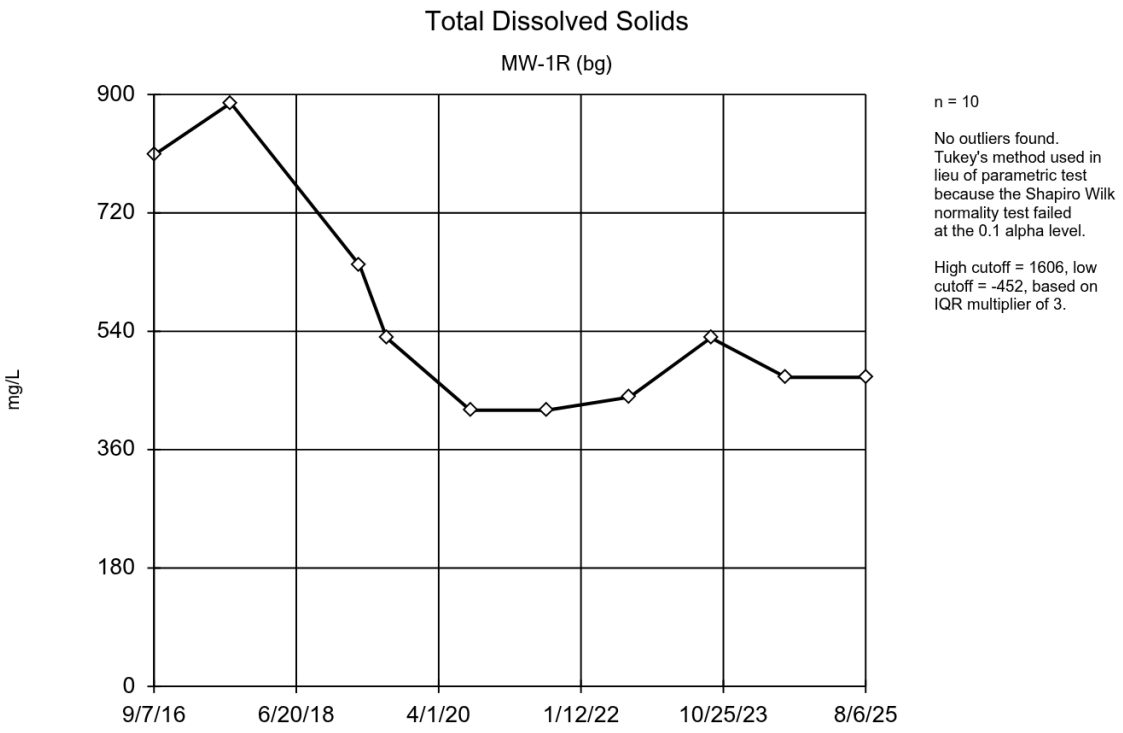
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
9/29/1999	350
9/13/2000	340
9/19/2001	210
9/11/2002	320
9/10/2003	260
9/15/2004	160
9/14/2005	260
9/13/2006	157
9/12/2007	138
9/17/2008	291
9/16/2009	298
8/31/2010	403
9/13/2011	374
9/18/2012	318
9/27/2013	264
9/10/2014	97.8
9/2/2015	312
9/7/2016	323
8/24/2017	346
4/6/2019	190
8/7/2019	60
8/24/2020	50
8/10/2021	53
8/23/2022	28
8/29/2023	60
8/6/2024	80
8/6/2025	57



Tukey's Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

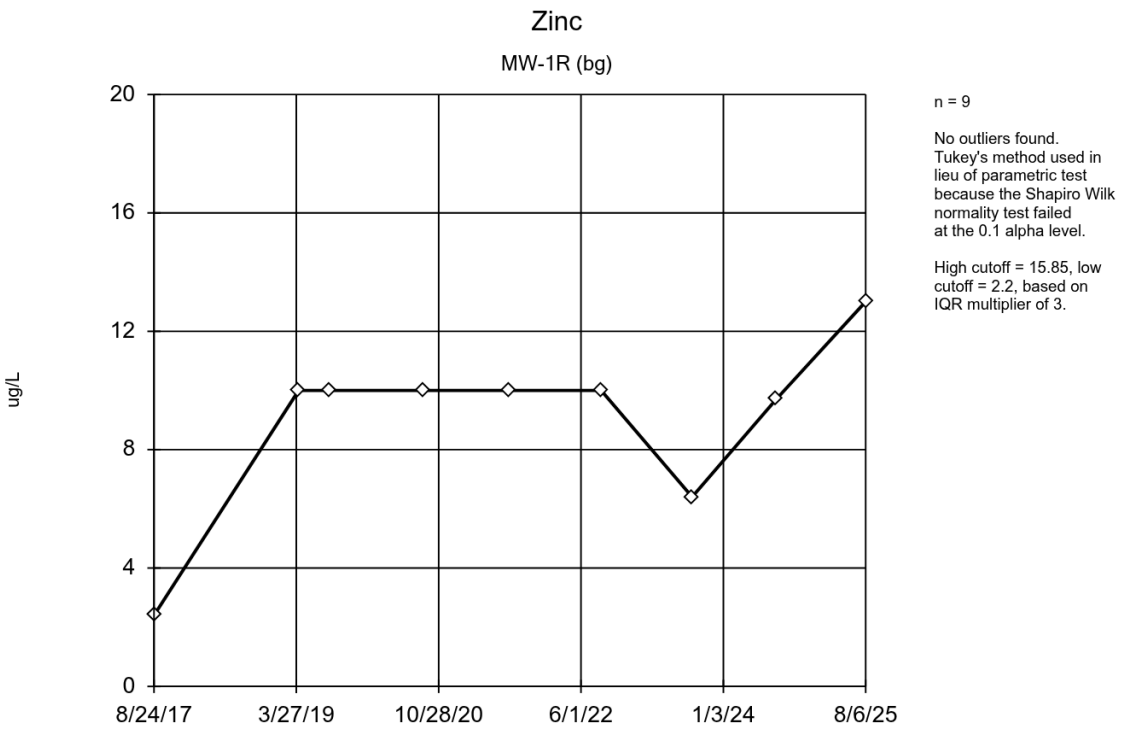
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
9/7/2016	808
8/24/2017	887
4/6/2019	640
8/7/2019	530
8/24/2020	420
8/10/2021	420
8/23/2022	440
8/29/2023	530
8/6/2024	470
8/6/2025	470



Tukey's Outlier Screening Analysis Run 10/7/2025 9:58 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 9:59 AM View: Shallow Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)
8/24/2017	2.4 (J)
4/6/2019	<10
8/7/2019	<10
8/24/2020	<10
8/10/2021	<10
8/23/2022	<10 (U)
8/29/2023	<6.4 (U)
8/6/2024	<9.7
8/6/2025	<13 (U)

ND substitution: RL or RL/2 if <15% NDs.

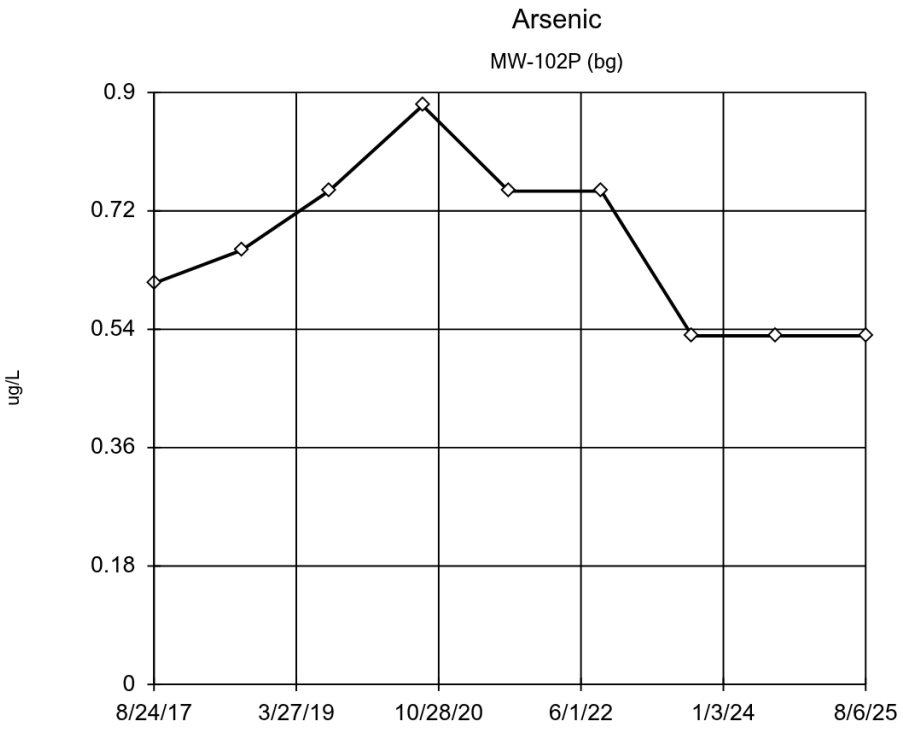
Attachment D4

Outlier Analysis - Pennsylvanian

Outlier Analysis

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 10:07 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Arsenic (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	0.6656	0.1253	normal	ShapiroWilk
Barium (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	23.99	1.625	normal	ShapiroWilk
Beryllium (ug/L)	**MW-102P (bg)**	**Yes**	**1.3**	**8/29/2023**	**NP (nrm)**	**NaN**	**9**	**0.3526**	**0.37**	**unknown**	**ShapiroWilk**
Boron (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	1654	188.6	normal	ShapiroWilk
Chloride (mg/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	14	8.95	0.4398	normal	ShapiroWilk
Cobalt (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	1.052	0.2333	normal	ShapiroWilk
Copper (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	1.957	1.289	normal	ShapiroWilk
Fluoride (mg/L)	MW-102P (bg)	No	n/a	n/a	NP (nrm)	NaN	10	0.55	0.2256	unknown	ShapiroWilk
Iron (ug/L)	MW-102P (bg)	No	n/a	n/a	NP (nrm)	NaN	9	4573	1255	unknown	ShapiroWilk
Lead (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	0.334	0.3095	ln(x)	ShapiroWilk
Magnesium (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	149667	19196	normal	ShapiroWilk
Manganese (ug/L)	MW-102P (bg)	No	n/a	n/a	NP (nrm)	NaN	9	475.8	105.9	unknown	ShapiroWilk
Selenium (ug/L)	MW-102P (bg)	No	n/a	n/a	NP (nrm)	NaN	9	0.9296	0.4974	unknown	ShapiroWilk
Sulfate (mg/L)	MW-102P (bg)	No	n/a	n/a	Dixon`s	0.05	14	1601	275.7	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	**MW-102P (bg)**	**Yes**	**310**	**8/11/2021**	**Dixon`s**	**0.05**	**10**	**2469**	**809.6**	**normal**	**ShapiroWilk**
Zinc (ug/L)	MW-102P (bg)	No	n/a	n/a	EPA 1989	0.05	9	13.98	11.34	ln(x)	ShapiroWilk



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.6656, std. dev. 0.1253, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.889
Critical = 0.859
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

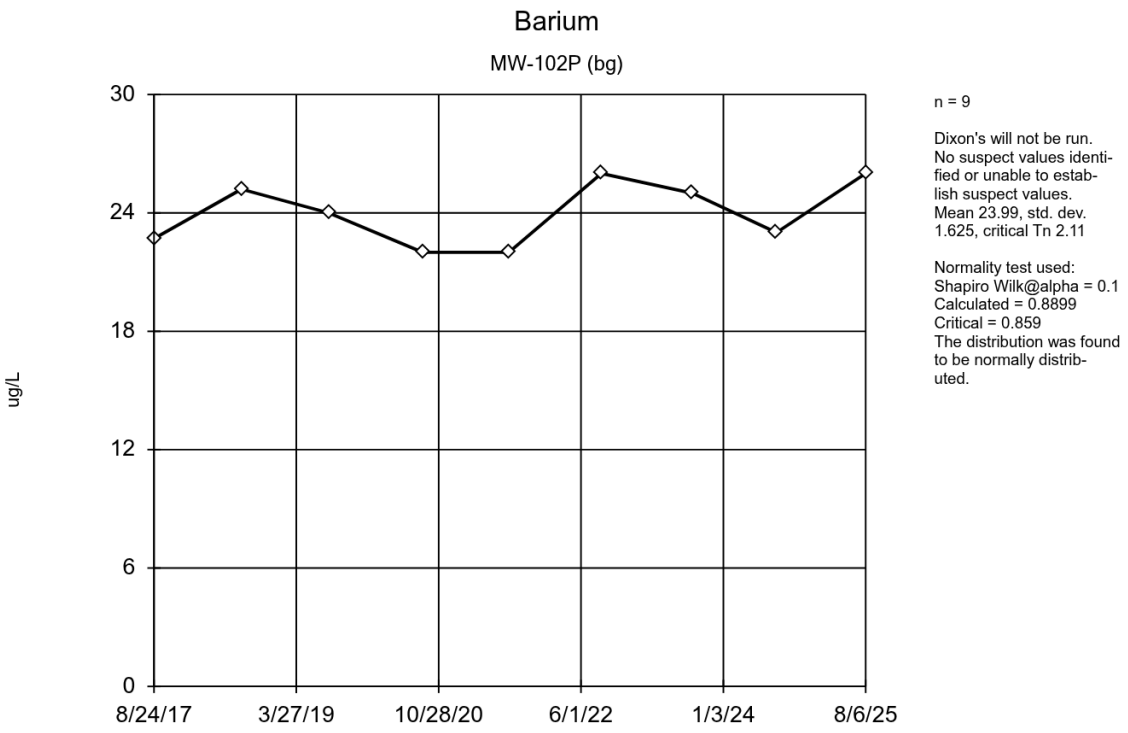
EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	0.61 (J)
8/16/2018	0.66 (J)
8/7/2019	<0.75
8/24/2020	<0.88
8/11/2021	<0.75
8/24/2022	<0.75 (U)
8/29/2023	<0.53 (U)
8/7/2024	<0.53
8/6/2025	<0.53 (U)

ND substitution: RL or RL/2 if <15% NDs.



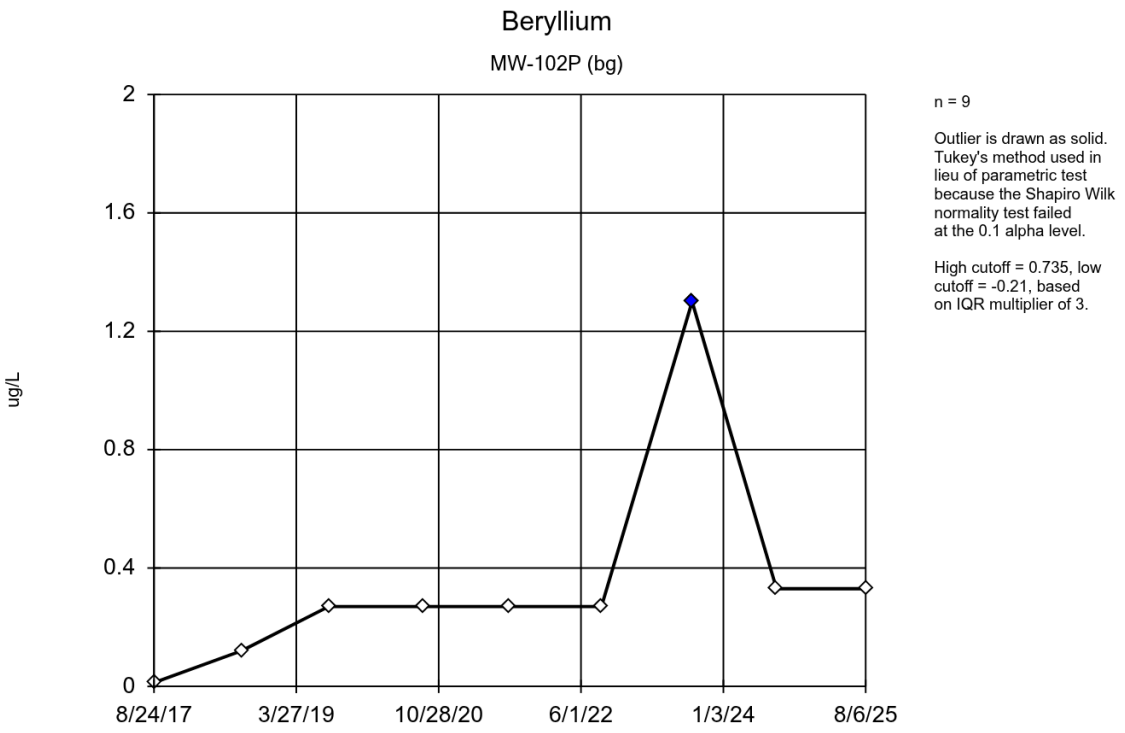
EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Barium (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	22.7
8/16/2018	25.2
8/7/2019	24
8/24/2020	22
8/11/2021	22 (B)
8/24/2022	26
8/29/2023	25
8/7/2024	23
8/6/2025	26 (B)



Tukey's Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

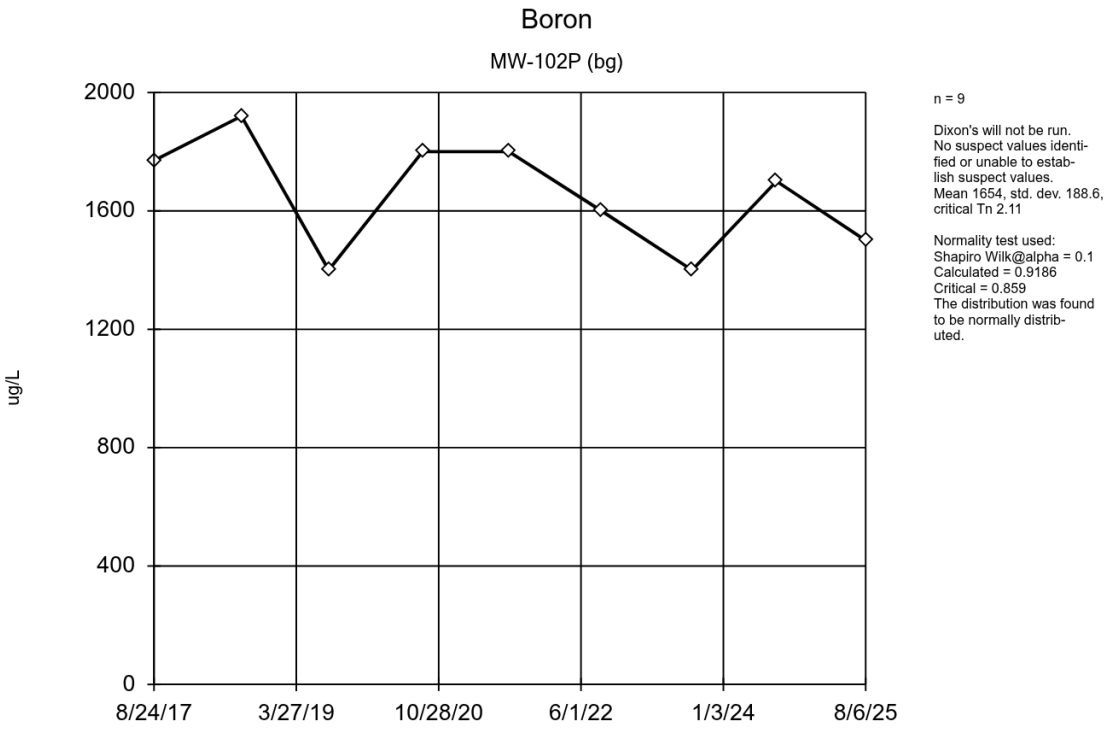
Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	0.013 (J)
8/16/2018	<0.12
8/7/2019	<0.27
8/24/2020	<0.27
8/11/2021	<0.27
8/24/2022	<0.27 (U)
8/29/2023	<1.3 (UO)
8/7/2024	<0.33
8/6/2025	<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1654, std. dev. 188.6, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9186
Critical = 0.859
The distribution was found to be normally distributed.

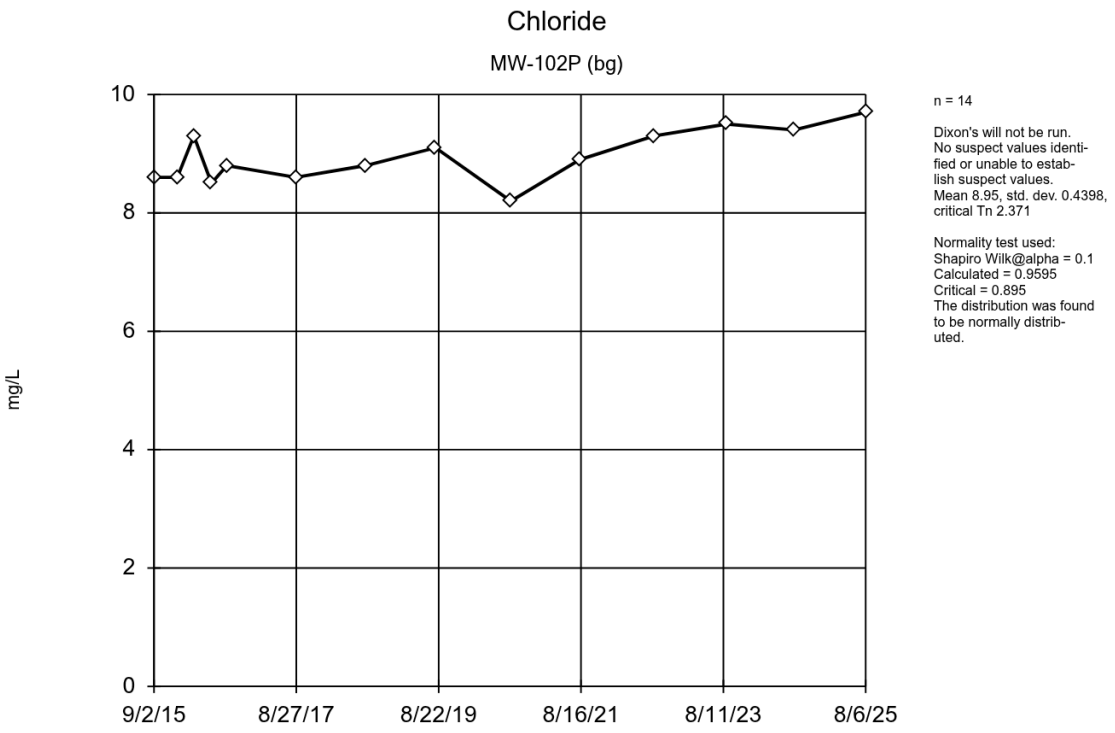
EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	1770
8/16/2018	1920
8/7/2019	1400 (B)
8/24/2020	1800
8/11/2021	1800
8/24/2022	1600
8/29/2023	1400
8/7/2024	1700
8/6/2025	1500



EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient

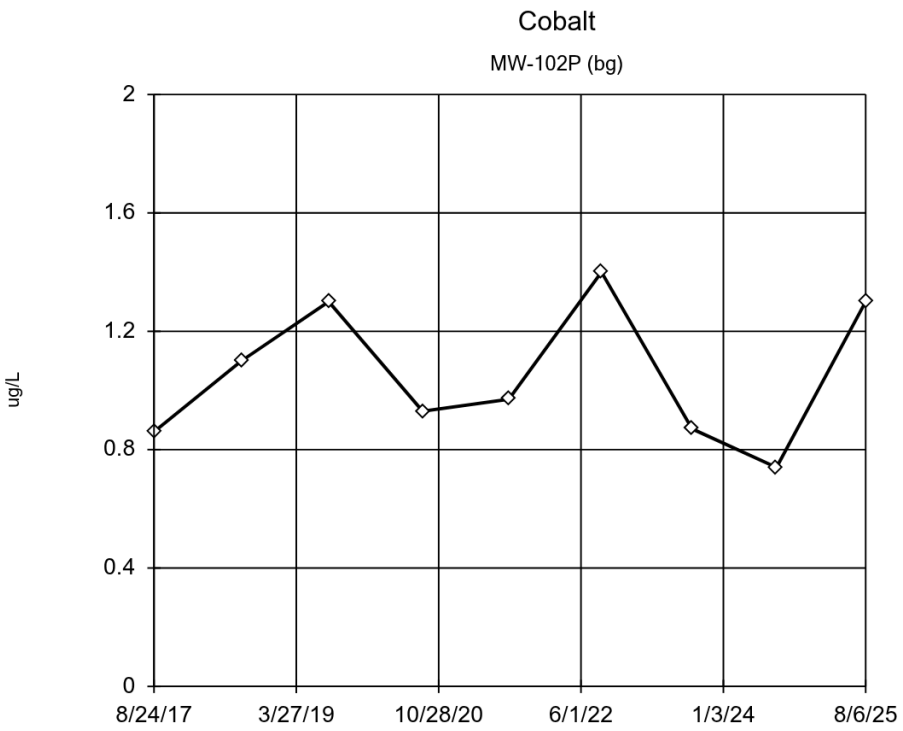
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
9/2/2015	8.6
12/30/2015	8.6
3/23/2016	9.3
6/21/2016	8.5
9/7/2016	8.8
8/24/2017	8.6
8/16/2018	8.8
8/7/2019	9.1
8/24/2020	8.2
8/11/2021	8.9
8/24/2022	9.3
8/29/2023	9.5
8/7/2024	9.4
8/6/2025	9.7



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.052, std. dev. 0.2333, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9187
Critical = 0.859
The distribution was found to be normally distributed.

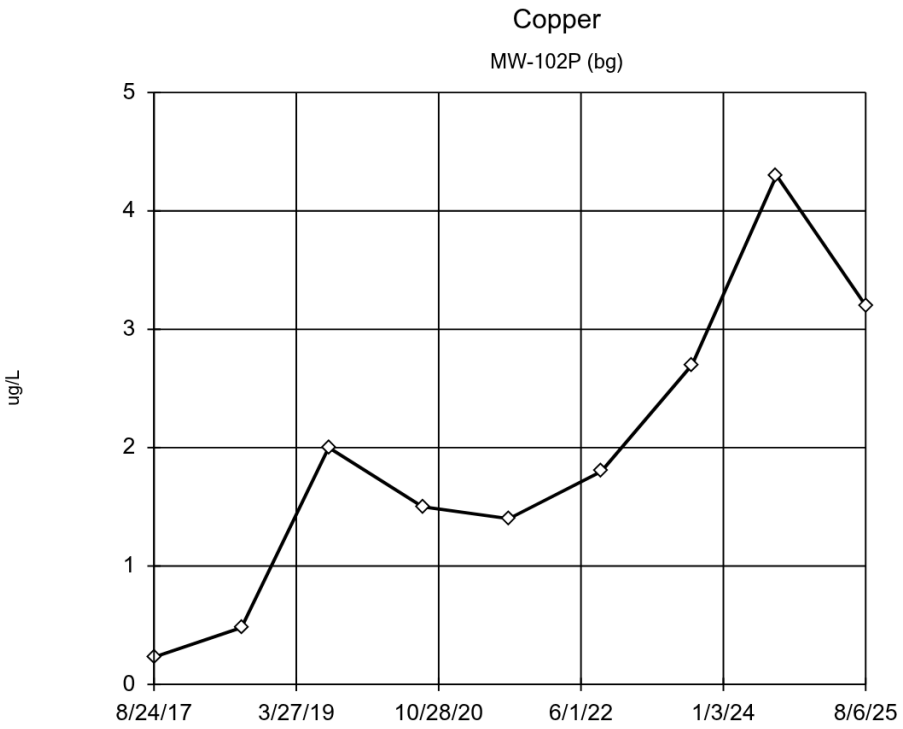
EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:05 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	0.86 (J)
8/16/2018	1.1
8/7/2019	1.3 (J)
8/24/2020	0.93
8/11/2021	0.97
8/24/2022	1.4
8/29/2023	0.87
8/7/2024	0.74
8/6/2025	1.3



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.957, std. dev. 1.289, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9655
Critical = 0.859
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

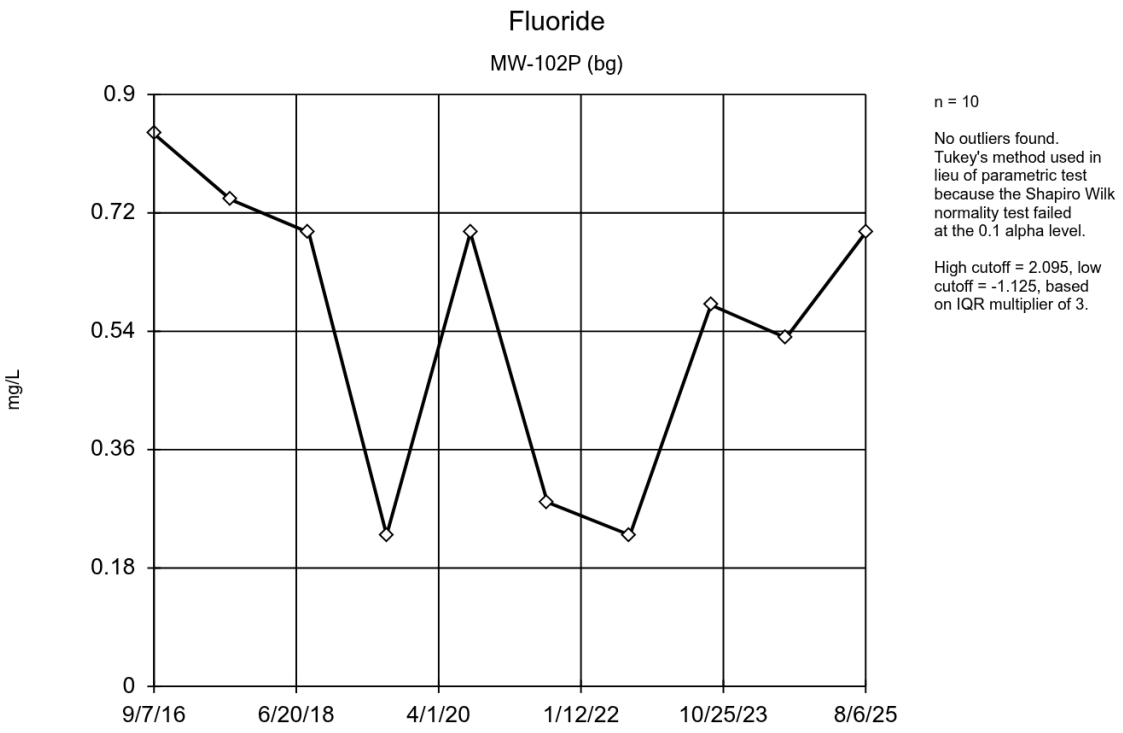
EPA 1989 Outlier Screening

Constituent: Copper (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	0.23 (J)
8/16/2018	<0.48
8/7/2019	<2
8/24/2020	<1.5
8/11/2021	<1.4
8/24/2022	<1.8 (U)
8/29/2023	2.7 (J)
8/7/2024	4.3 (J)
8/6/2025	<3.2 (U)

ND substitution: RL or RL/2 if <15% NDs.



Tukey's Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
9/7/2016	0.84
8/24/2017	0.74
8/16/2018	0.69
8/7/2019	<0.23
8/24/2020	0.69
8/11/2021	<0.28
8/24/2022	0.23 (J)
8/29/2023	0.58 (J)
8/7/2024	0.53 (J)
8/6/2025	0.69 (J)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

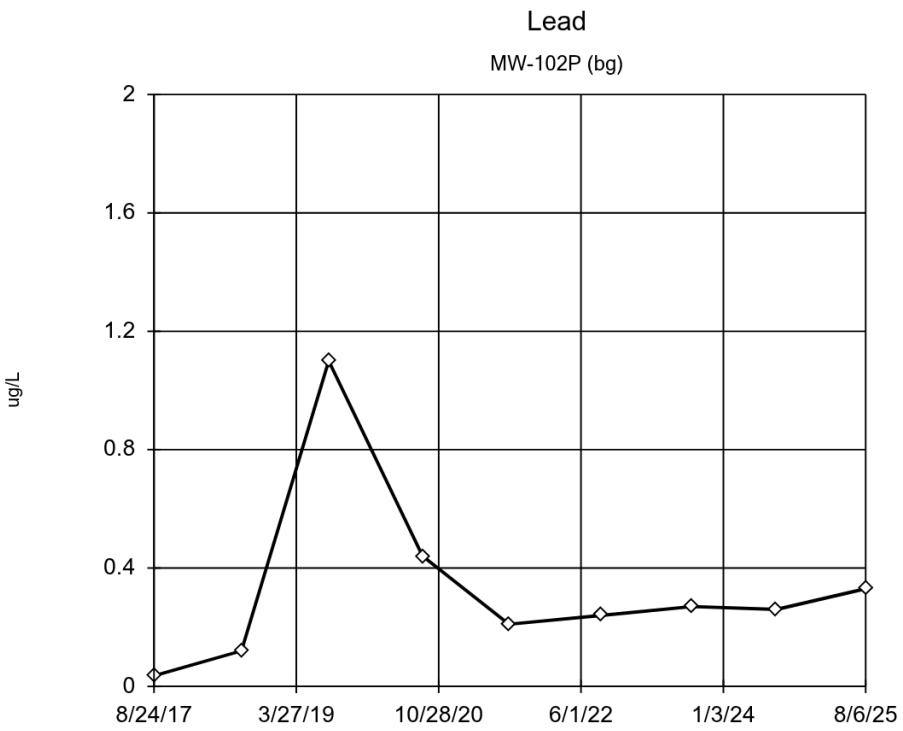
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Iron (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	5230
8/16/2018	5330
8/7/2019	5200
8/24/2020	5500
8/11/2021	5500
8/24/2022	2200
8/29/2023	3400
8/7/2024	5500
8/6/2025	3300



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.334, std. dev. 0.3095, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9311
Critical = 0.859 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

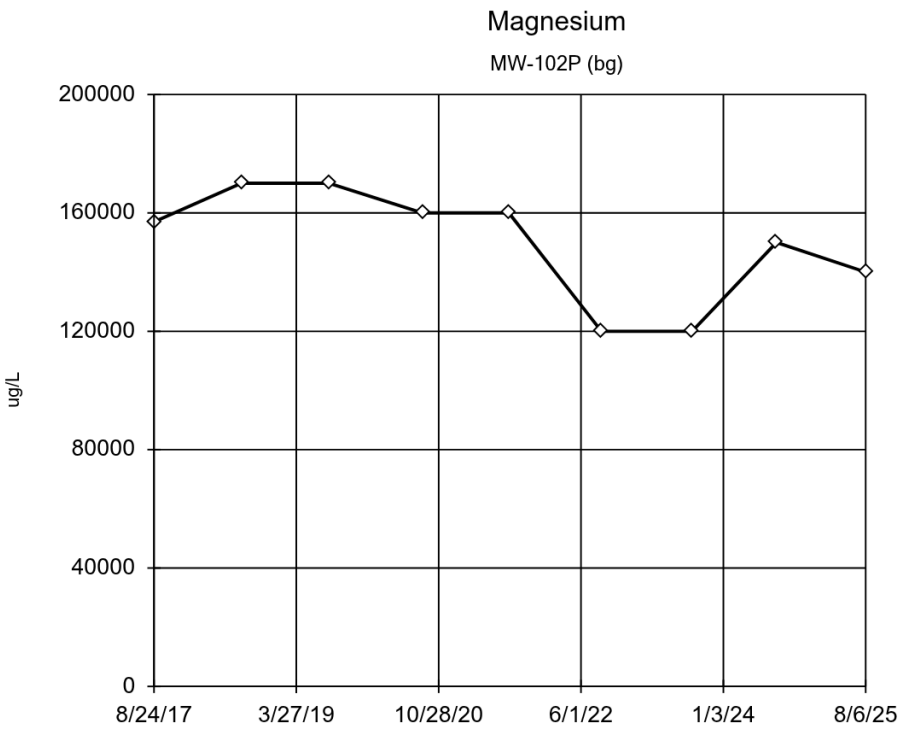
EPA 1989 Outlier Screening

Constituent: Lead (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	0.036 (J)
8/16/2018	<0.12
8/7/2019	<1.1
8/24/2020	<0.44
8/11/2021	<0.21
8/24/2022	<0.24 (U)
8/29/2023	0.27 (JB)
8/7/2024	<0.26
8/6/2025	<0.33 (U)

ND substitution: RL or RL/2 if <15% NDs.



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 149667, std. dev. 19196, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8671
Critical = 0.859
The distribution was found to be normally distributed.

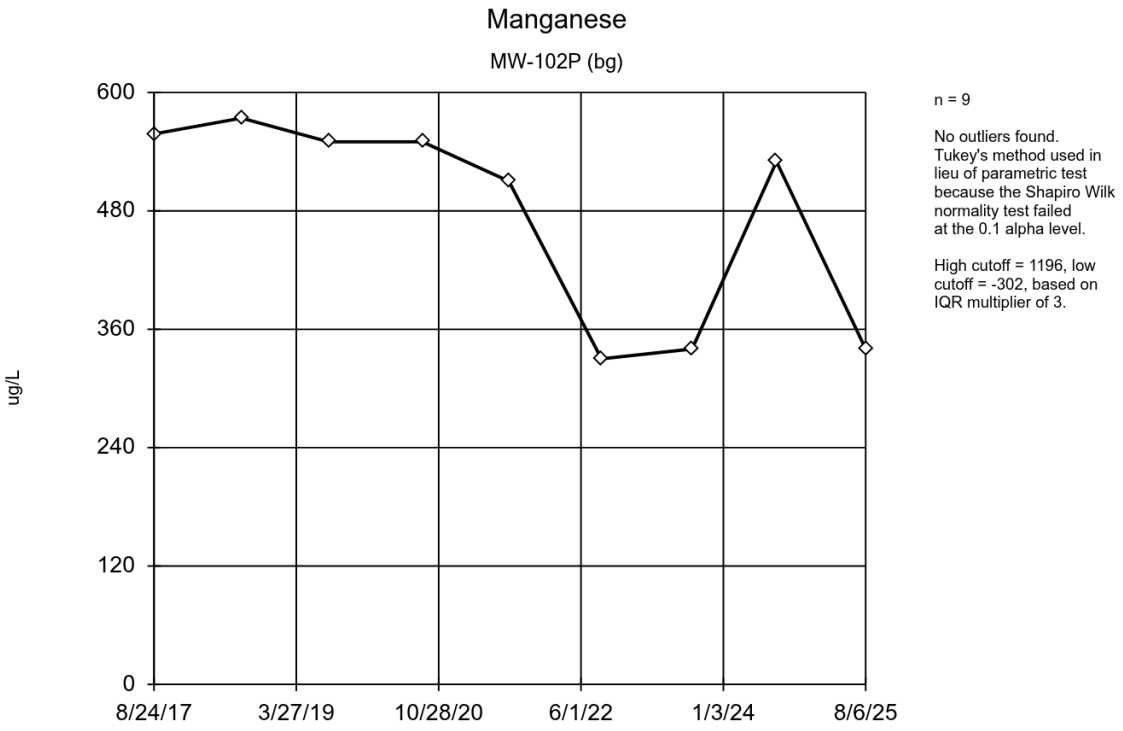
EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	157000
8/16/2018	170000
8/7/2019	170000
8/24/2020	160000
8/11/2021	160000
8/24/2022	120000
8/29/2023	120000
8/7/2024	150000
8/6/2025	140000



Tukey's Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

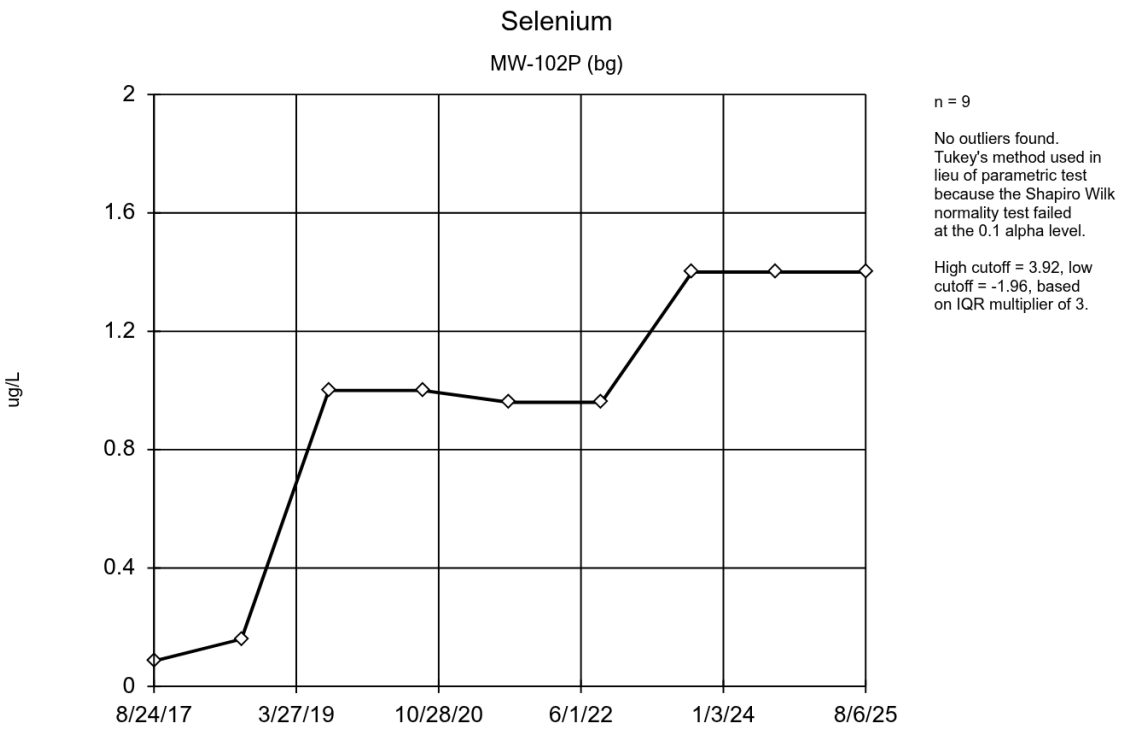
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Tukey's Outlier Screening

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	558
8/16/2018	574
8/7/2019	550
8/24/2020	550
8/11/2021	510
8/24/2022	330
8/29/2023	340
8/7/2024	530
8/6/2025	340



Tukey's Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

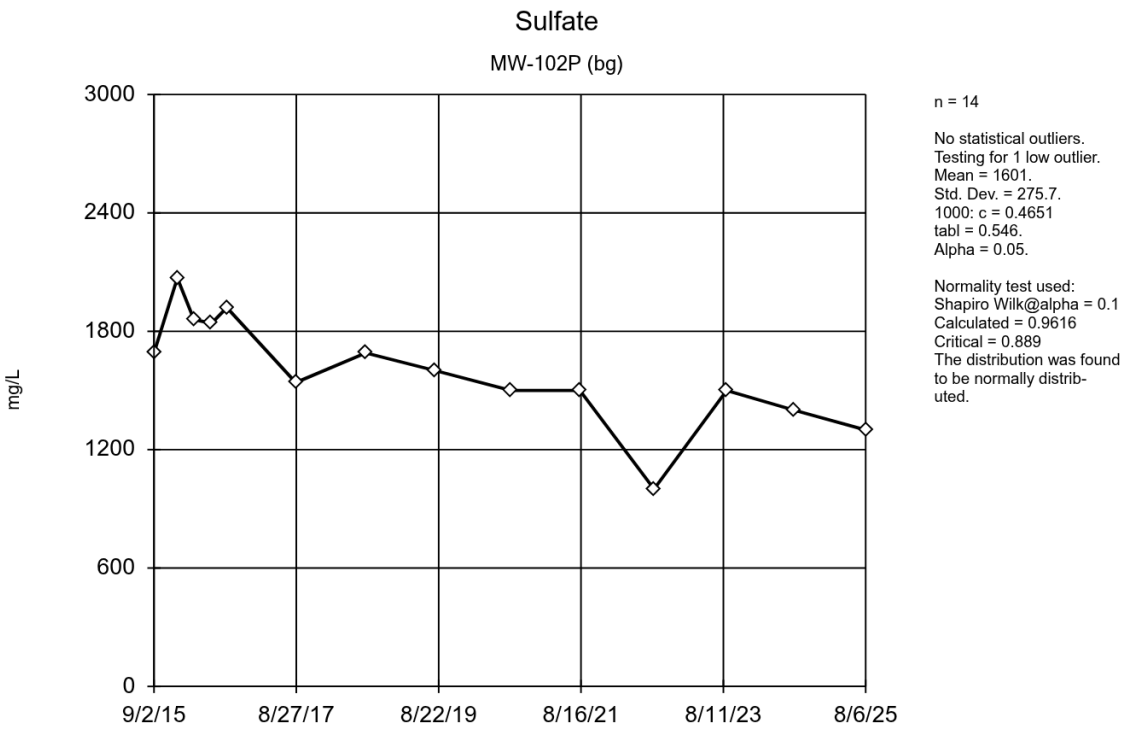
Tukey's Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	<0.086
8/16/2018	<0.16
8/7/2019	<1
8/24/2020	<1
8/11/2021	<0.96
8/24/2022	<0.96 (U)
8/29/2023	<1.4 (U)
8/7/2024	<1.4
8/6/2025	<1.4 (U)

ND substitution: RL or RL/2 if <15% NDs.



n = 14

No statistical outliers.
Testing for 1 low outlier.
Mean = 1601.
Std. Dev. = 275.7.
1000: c = 0.4651
tabl = 0.546.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9616
Critical = 0.889
The distribution was found to be normally distrib-uted.

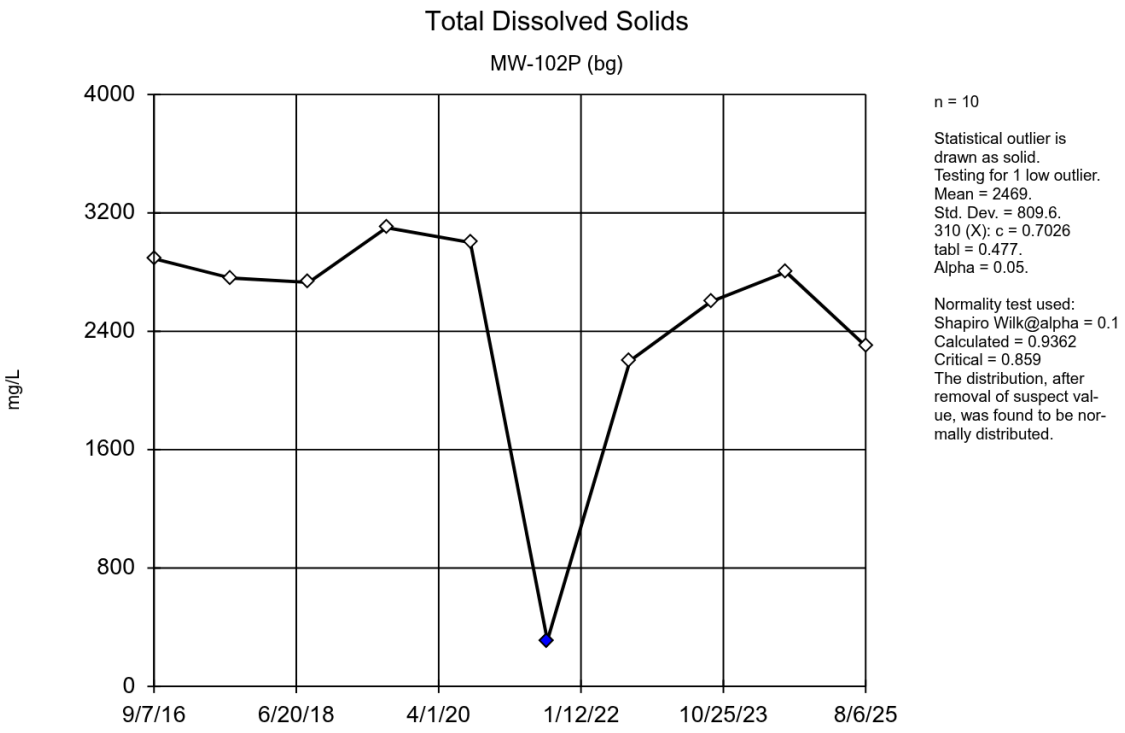
Dixon's Outlier Test Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Dixon's Outlier Test

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
9/2/2015	1690
12/30/2015	2070
3/23/2016	1860
6/21/2016	1840
9/7/2016	1920
8/24/2017	1540
8/16/2018	1690
8/7/2019	1600
8/24/2020	1500
8/11/2021	1500
8/24/2022	1000
8/29/2023	1500
8/7/2024	1400
8/6/2025	1300



Dixon's Outlier Test Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

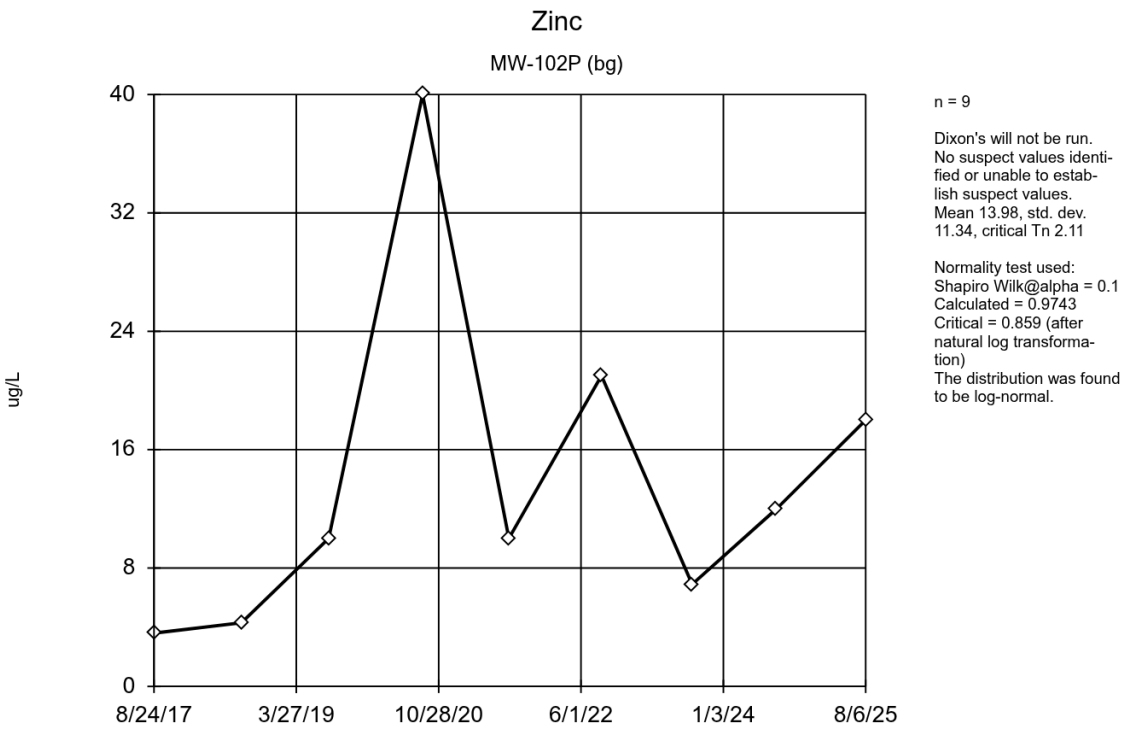
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Dixon's Outlier Test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
9/7/2016	2890
8/24/2017	2760
8/16/2018	2730
8/7/2019	3100
8/24/2020	3000
8/11/2021	310 (XO)
8/24/2022	2200
8/29/2023	2600
8/7/2024	2800
8/6/2025	2300



EPA 1989 Outlier Screening Analysis Run 10/7/2025 10:06 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

EPA 1989 Outlier Screening

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 10:07 AM View: Pennsylvanian Unit Upgradient

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)
8/24/2017	3.6 (J)
8/16/2018	4.3 (J)
8/7/2019	<10
8/24/2020	<40
8/11/2021	<10
8/24/2022	21
8/29/2023	6.9 (J)
8/7/2024	12 (J)
8/6/2025	18 (J)

ND substitution: RL or RL/2 if <15% NDs.

Attachment D5

Interwell Prediction Limit Analysis - Shallow

Prediction Limit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 11:51 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	MW-100R	0.880	n/a	8/5/2025	0.55J	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-101R	0.880	n/a	8/6/2025	0.53ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	**MW-108**	**0.880**	**n/a**	**8/5/2025**	**3.4**	**Yes**	**9**	**88.89**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Arsenic (ug/L)	MW-15R	0.880	n/a	8/5/2025	0.53ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-17	0.880	n/a	8/10/2021	0.75ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Barium (ug/L)	MW-100R	88	n/a	8/5/2025	41	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-101R	88	n/a	8/6/2025	43	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-108	88	n/a	8/5/2025	34	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-15R	88	n/a	8/5/2025	31	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-17	88	n/a	8/10/2021	36	No	9	0	No	0.001754	Param Inter 1 of 2
Beryllium (ug/L)	MW-100R	0.400	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-101R	0.400	n/a	8/6/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-108	0.400	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-15R	0.400	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-17	0.400	n/a	8/10/2021	0.27ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-100R	120	n/a	8/5/2025	82ND	No	9	44.44	No	0.001754	Param Inter 1 of 2
Boron (ug/L)	**MW-101R**	**120**	**n/a**	**8/6/2025**	**750**	**Yes**	**9**	**44.44**	**No**	**0.001754**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-108**	**120**	**n/a**	**8/5/2025**	**320**	**Yes**	**9**	**44.44**	**No**	**0.001754**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-15R**	**120**	**n/a**	**8/5/2025**	**550**	**Yes**	**9**	**44.44**	**No**	**0.001754**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-17**	**120**	**n/a**	**8/10/2021**	**650**	**Yes**	**9**	**44.44**	**No**	**0.001754**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-100R	224	n/a	8/5/2025	27	No	36	0	ln(x)	0.001754	Param Inter 1 of 2
Chloride (mg/L)	MW-101R	224	n/a	8/6/2025	6.5	No	36	0	ln(x)	0.001754	Param Inter 1 of 2
Chloride (mg/L)	MW-108	224	n/a	8/5/2025	2.8J	No	36	0	ln(x)	0.001754	Param Inter 1 of 2
Chloride (mg/L)	MW-15R	224	n/a	8/5/2025	10	No	36	0	ln(x)	0.001754	Param Inter 1 of 2
Chloride (mg/L)	MW-17	224	n/a	8/10/2021	4.4J	No	36	0	ln(x)	0.001754	Param Inter 1 of 2
Cobalt (ug/L)	MW-100R	0.370	n/a	8/5/2025	0.17ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-101R	0.370	n/a	8/6/2025	0.44J	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	**MW-108**	**0.370**	**n/a**	**8/5/2025**	**4.2**	**Yes**	**9**	**66.67**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Cobalt (ug/L)	**MW-15R**	**0.370**	**n/a**	**8/5/2025**	**2.8**	**Yes**	**9**	**66.67**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Cobalt (ug/L)	**MW-17**	**0.370**	**n/a**	**8/10/2021**	**3.4**	**Yes**	**9**	**66.67**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Copper (ug/L)	MW-100R	3.20	n/a	8/5/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-101R	3.20	n/a	8/6/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-108	3.20	n/a	8/5/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-15R	3.20	n/a	8/5/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-17	3.20	n/a	8/10/2021	1.4ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-100R	0.911	n/a	8/5/2025	0.46J	No	10	10	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-101R	0.911	n/a	8/6/2025	0.44J	No	10	10	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-108	0.911	n/a	8/5/2025	0.5J	No	10	10	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-15R	0.911	n/a	8/5/2025	0.19ND	No	10	10	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-17	0.911	n/a	8/10/2021	0.46J	No	10	10	No	0.001754	Param Inter 1 of 2
Iron (ug/L)	MW-100R	606	n/a	8/5/2025	50ND	No	9	44.44	ln(x)	0.001754	Param Inter 1 of 2
Iron (ug/L)	MW-101R	606	n/a	8/6/2025	200	No	9	44.44	ln(x)	0.001754	Param Inter 1 of 2
Iron (ug/L)	**MW-108**	**606**	**n/a**	**8/5/2025**	**3800**	**Yes**	**9**	**44.44**	**ln(x)**	**0.001754**	**Param Inter 1 of 2**
Iron (ug/L)	MW-15R	606	n/a	8/5/2025	480	No	9	44.44	ln(x)	0.001754	Param Inter 1 of 2
Iron (ug/L)	MW-17	606	n/a	8/10/2021	48J	No	9	44.44	ln(x)	0.001754	Param Inter 1 of 2
Lead (ug/L)	MW-100R	0.900	n/a	8/5/2025	0.33ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-101R	0.900	n/a	8/6/2025	0.33ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-108	0.900	n/a	8/5/2025	0.33ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-15R	0.900	n/a	8/5/2025	0.33ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-17	0.900	n/a	8/10/2021	0.21ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2

Prediction Limit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 11:51 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Magnesium (ug/L)	MW-100R	48100	n/a	8/5/2025	40000	No	9	0	n/a	0.01707	NP Inter (normality) ...
Magnesium (ug/L)	**MW-101R**	**48100**	**n/a**	**8/6/2025**	**68000**	**Yes**	**9**	**0**	**n/a**	**0.01707**	**NP Inter (normality) ...**
Magnesium (ug/L)	MW-108	48100	n/a	8/5/2025	16000	No	9	0	n/a	0.01707	NP Inter (normality) ...
Magnesium (ug/L)	**MW-15R**	**48100**	**n/a**	**8/5/2025**	**120000**	**Yes**	**9**	**0**	**n/a**	**0.01707**	**NP Inter (normality) ...**
Magnesium (ug/L)	MW-17	48100	n/a	8/10/2021	25000	No	9	0	n/a	0.01707	NP Inter (normality) ...
Manganese (ug/L)	MW-100R	20.0	n/a	8/5/2025	3.6ND	No	9	55.56	n/a	0.01707	NP Inter (NDs) 1 of 2
Manganese (ug/L)	**MW-101R**	**20.0**	**n/a**	**8/6/2025**	**160**	**Yes**	**9**	**55.56**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Manganese (ug/L)	**MW-108**	**20.0**	**n/a**	**8/5/2025**	**790**	**Yes**	**9**	**55.56**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Manganese (ug/L)	**MW-15R**	**20.0**	**n/a**	**8/5/2025**	**570**	**Yes**	**9**	**55.56**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Manganese (ug/L)	**MW-17**	**20.0**	**n/a**	**8/10/2021**	**2200**	**Yes**	**9**	**55.56**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Selenium (ug/L)	MW-100R	2.76	n/a	8/5/2025	1.4ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Selenium (ug/L)	MW-101R	2.76	n/a	8/6/2025	2.8J	No	9	33.33	No	0.001754	Param Inter 1 of 2
Selenium (ug/L)	MW-108	2.76	n/a	8/5/2025	1.4ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Selenium (ug/L)	MW-15R	2.76	n/a	8/5/2025	1.4ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Selenium (ug/L)	MW-17	2.76	n/a	8/10/2021	0.96ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-100R	448	n/a	8/5/2025	170	No	27	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	**MW-101R**	**448**	**n/a**	**8/6/2025**	**480**	**Yes**	**27**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-108	448	n/a	8/5/2025	140	No	27	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-15R	448	n/a	8/5/2025	440	No	27	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-17	448	n/a	8/10/2021	280	No	27	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-100R	957	n/a	8/5/2025	640	No	10	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	**MW-101R**	**957**	**n/a**	**8/6/2025**	**1000**	**Yes**	**10**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	MW-108	957	n/a	8/5/2025	380	No	10	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	**MW-15R**	**957**	**n/a**	**8/5/2025**	**1400**	**Yes**	**10**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	MW-17	957	n/a	8/10/2021	530	No	10	0	No	0.001754	Param Inter 1 of 2
Zinc (ug/L)	MW-100R	13.0	n/a	8/5/2025	13ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Zinc (ug/L)	MW-101R	13.0	n/a	8/6/2025	13ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Zinc (ug/L)	**MW-108**	**13.0**	**n/a**	**8/5/2025**	**46**	**Yes**	**9**	**88.89**	**n/a**	**0.01707**	**NP Inter (NDs) 1 of 2**
Zinc (ug/L)	MW-15R	13.0	n/a	8/5/2025	13ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Zinc (ug/L)	MW-17	13.0	n/a	8/10/2021	10ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2

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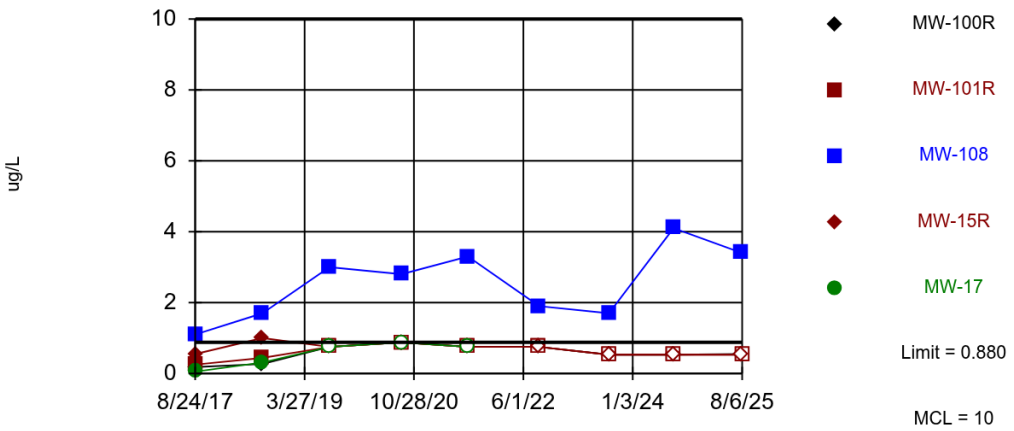
Hollow symbols indicate censored values.

Exceeds Limit: MW-108

Arsenic

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 88.89% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

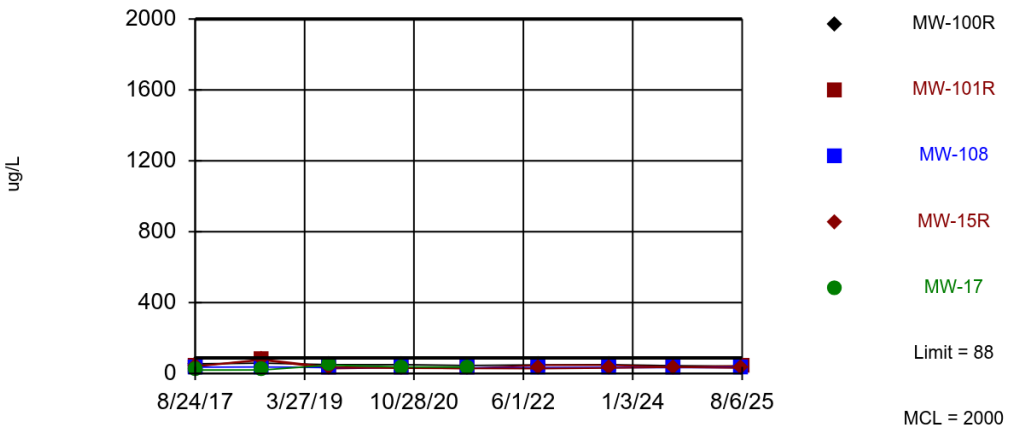
	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.18 (J)	0.55 (J)	0.2 (J)	0.052 (J)	0.25 (J)	1.1
8/16/2018	0.27 (J)	1		0.31 (J)	0.44 (J)	1.7
4/6/2019			<0.75			
8/7/2019	<0.75	<0.75	<0.75	<0.75	<0.75	3
8/24/2020	<0.88		<0.88	<0.88	<0.88	2.8
8/25/2020		<0.88				
8/10/2021			<0.75	<0.75		
8/11/2021	<0.75				<0.75	3.3
8/12/2021		<0.75				
8/23/2022			<0.75 (U)			
8/24/2022	<0.75 (U)	<0.75 (U)			<0.75 (U)	1.9 (J)
8/29/2023	<0.53 (U)		<0.53 (U)		<0.53 (U)	
8/30/2023		<0.53 (U)				1.7 (J)
8/6/2024	<0.53	<0.53	<0.53		<0.53	
8/7/2024						4.1
8/5/2025	0.55 (J)	<0.53 (U)				3.4
8/6/2025			<0.53 (U)		<0.53 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Within Limit

Barium

Interwell Parametric



Background Data Summary: Mean=72.78, Std. Dev.=6.058, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9513, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Barium (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	54.2	40.6	61	19.4	40	35.4
8/16/2018	58.4	80.5		20.2	75.9	37.1
4/6/2019			81			
8/7/2019	50	37	75	47	28	34
8/24/2020	50		76	37	33	33
8/25/2020		30				
8/10/2021			71 (B)	36 (B)		
8/11/2021	45 (B)				28 (B)	32 (B)
8/12/2021		29 (B)				
8/23/2022			78			
8/24/2022	49	28			47	33
8/29/2023	50		75		47	
8/30/2023		31				34
8/6/2024	44	36	71		37	
8/7/2024						34
8/5/2025	41	31 (B)				34 (B)
8/6/2025			67		43 (B)	

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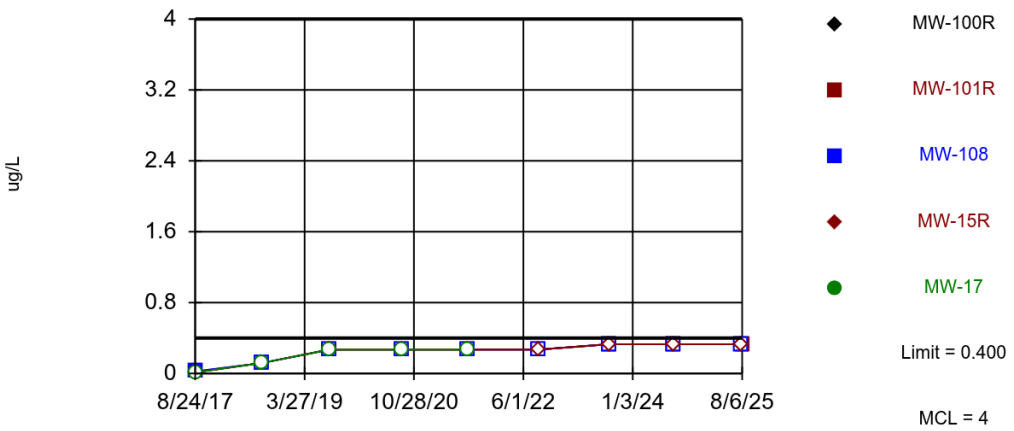
Hollow symbols indicate censored values.

Within Limit

Beryllium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 88.89% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	<0.012	<0.012	<0.012	<0.012	0.02 (J)	0.025 (J)
8/16/2018	<0.12	<0.12		<0.12	<0.12	<0.12
4/6/2019			<0.27			
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.27		<0.27	<0.27	<0.27	<0.27
8/25/2020		<0.27				
8/10/2021			<0.27	<0.27		
8/11/2021	<0.27				<0.27	<0.27
8/12/2021		<0.27				
8/23/2022			<0.27 (U)			
8/24/2022	<0.27 (U)	<0.27 (U)			<0.27 (U)	<0.27 (U)
8/29/2023	<0.33 (U)		0.4 (J)		<0.33 (U)	
8/30/2023		<0.33 (U)				<0.33 (U)
8/6/2024	<0.33	<0.33	<0.33		<0.33	
8/7/2024						<0.33
8/5/2025	<0.33 (U)	<0.33 (U)				<0.33 (U)
8/6/2025			<0.33 (U)		<0.33 (U)	

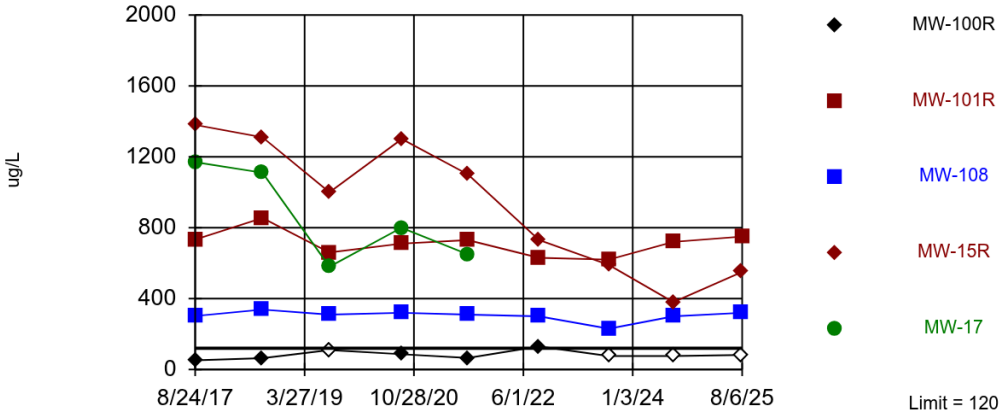
ND substitution: RL or RL/2 if <15% NDs.

Sanitas™ v.10.1.01 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-101R, MW-108, MW-15R, MW-17

Boron

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=75.46, Std. Dev.=17.73, n=9, 44.44% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.889, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	51.8 (J)	1380	76 (J)	1170	733	302
8/16/2018	64.2 (J)	1310		1110	855	338
4/6/2019			110 (J)			
8/7/2019	<110	1000 (B)	110 (J,B)	580 (B)	660 (B)	310 (B)
8/24/2020	86 (J)		<80	800	710	320
8/25/2020		1300				
8/10/2021			<58	650		
8/11/2021	65 (J)				730	310
8/12/2021		1100				
8/23/2022			65 (J)			
8/24/2022	130	730			630	300
8/29/2023	<76 (U)		<76 (U)		620	
8/30/2023		590				230
8/6/2024	<76	380	<76		720	
8/7/2024						300
8/5/2025	<82 (U)	550				320
8/6/2025			100		750	

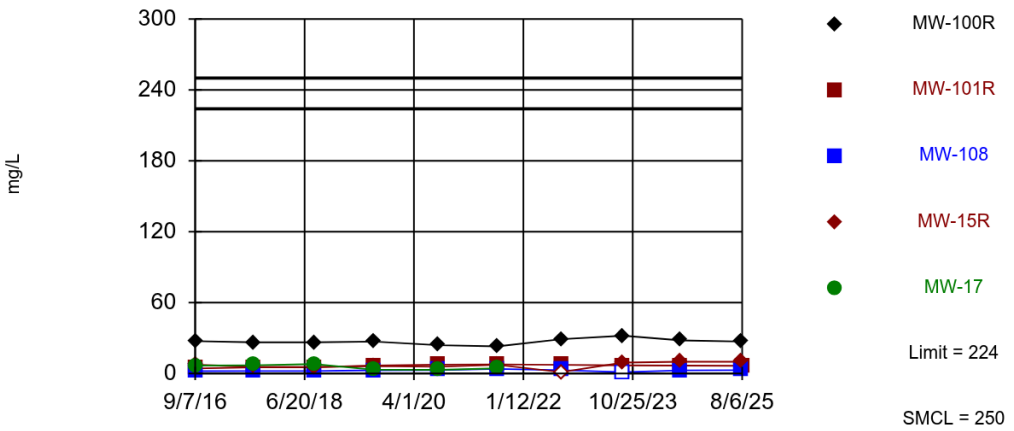
ND substitution: RL or RL/2 if <15% NDs.

Sanitas™ v.10.1.01 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Chloride

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=4.103, Std. Dev.=0.702, n=36. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9427, critical = 0.912. Kappa = 1.866 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)	MW-100R	MW-15R	MW-17	MW-108	MW-101R
8/10/1995	170					
10/6/1995	150					
1/25/1996	174					
4/26/1996	121					
7/19/1996	138.3					
10/21/1996	106					
4/28/1997	98					
10/6/1997	120					
4/22/1998	120					
10/7/1998	580 (X)					
9/29/1999	110					
9/13/2000	89.6					
9/19/2001	53.3					
9/11/2002	59.5					
9/10/2003	64.8					
9/15/2004	37.9					
9/14/2005	60					
9/13/2006	35.9					
9/12/2007	34.5					
9/17/2008	70.4					
9/16/2009	84.9					
8/31/2010	164					
9/13/2011	113					
9/18/2012	74.4					
9/27/2013	54.7					
9/10/2014	26.6					
9/2/2015	62.4					
9/7/2016	64.9	27.4	7.4	6.7	2	4.3
8/24/2017	60.6	26.4	5.6	7	2.1	5.3
8/16/2018		26.4	5.5	8	2.1	5.3
4/6/2019	24					
8/7/2019	25	27	6.3	3.2 (J)	2.7 (J)	6.7
8/24/2020	22	24		3.1 (J)	2.8 (J)	7.5
8/25/2020			5.7			
8/10/2021	23			4.4 (J)		
8/11/2021		23			3.9 (J)	7.7
8/12/2021			7.3			
8/23/2022	13					
8/24/2022		29	<2.3 (U)		2.8 (J)	7.3
8/29/2023	26	32				6.9
8/30/2023			9.2		<2.3 (U)	
8/6/2024	29	28	10			6.7
8/7/2024					2.6 (J)	
8/5/2025		27	10		2.8 (J)	
8/6/2025	25					6.5

ND substitution: RL or RL/2 if <15% NDs.

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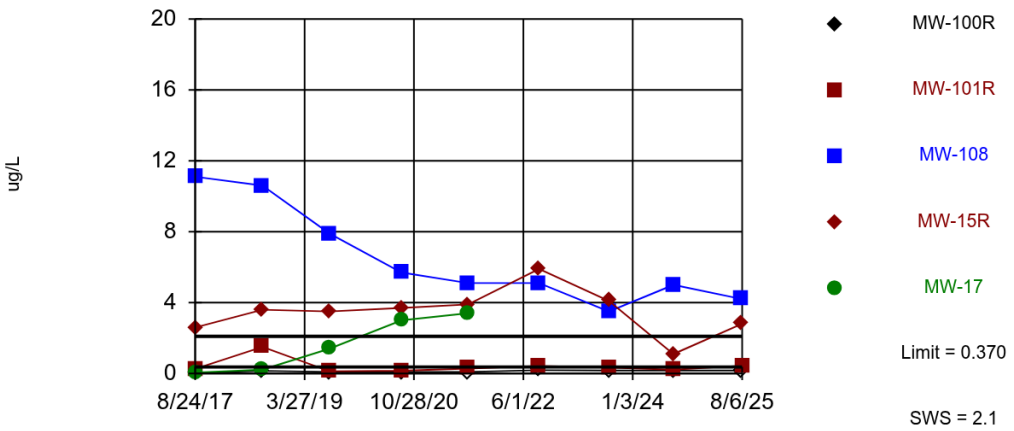
Hollow symbols indicate censored values.

Exceeds Limit: MW-108, MW-15R, MW-17

Cobalt

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 66.67% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.028 (J)	2.6	0.049 (J)	0.054 (J)	0.26 (J)	11.1
8/16/2018	<0.15	3.6		0.22 (J)	1.5	10.6
4/6/2019			0.37 (J)			
8/7/2019	<0.091	3.5	<0.091	1.4	0.13 (J)	7.9
8/24/2020	<0.091		0.22 (J)	3	0.16 (J)	5.7
8/25/2020		3.7				
8/10/2021			<0.091	3.4		
8/11/2021	<0.091				0.28 (J)	5.1
8/12/2021		3.9				
8/23/2022			<0.19 (U)			
8/24/2022	<0.19 (U)	5.9			0.43 (J)	5.1
8/29/2023	<0.17 (U)		<0.17 (U)		0.34 (J)	
8/30/2023		4.1				3.5
8/6/2024	<0.17	1.1	<0.17		0.22 (J)	
8/7/2024						5
8/5/2025	<0.17 (U)	2.8				4.2
8/6/2025			<0.17 (U)		0.44 (J)	

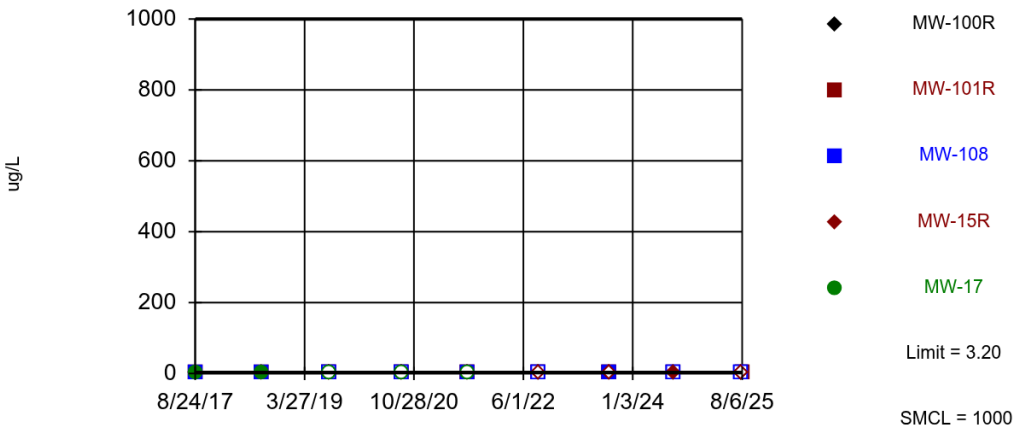
ND substitution: RL or RL/2 if <15% NDs.

Sanitas™ v.10.1.01 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Copper

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 66.67% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Copper (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.32 (J)	0.38 (J)	0.99 (J)	0.52 (J)	0.92 (J)	0.61 (J)
8/16/2018	0.74 (J)	2.7		0.66 (J)	2.6	0.57 (J)
4/6/2019			2.1 (J)			
8/7/2019	<2	<2	<2	<2	<2	<2
8/24/2020	<1.5		1.6 (J)	<1.5	<1.5	<1.5
8/25/2020		<1.5				
8/10/2021			<1.4	<1.4		
8/11/2021	<1.4				<1.4	1.7 (J)
8/12/2021		2.5 (J)				
8/23/2022			<1.8 (U)			
8/24/2022	<1.8 (U)	<1.8 (U)			<1.8 (U)	<1.8 (U)
8/29/2023	1.8 (J)		<1.8 (U)		<1.8 (U)	
8/30/2023		<1.8 (U)				2 (J)
8/6/2024	<1.8	1.8 (J)	<1.8		2 (J)	
8/7/2024						<1.8
8/5/2025	<3.2 (U)	<3.2 (U)				<3.2 (U)
8/6/2025			<3.2 (U)		<3.2 (U)	

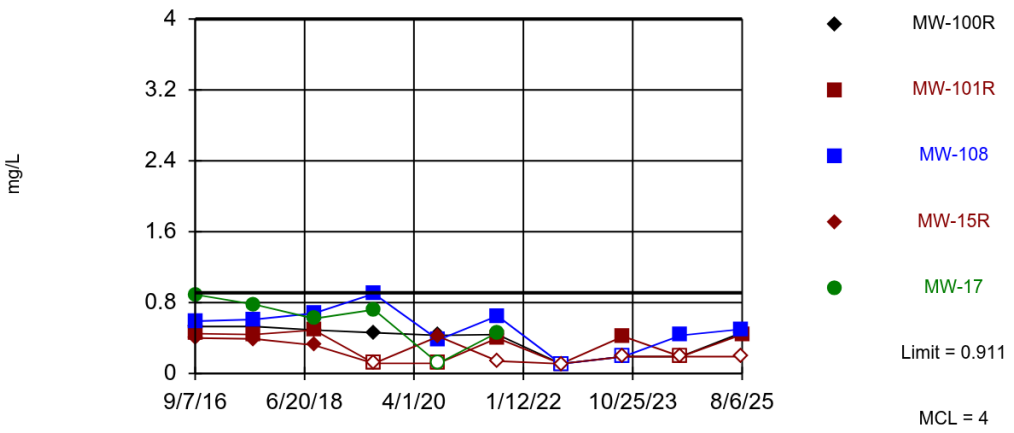
ND substitution: RL or RL/2 if <15% NDs.

Sanitas™ v.10.1.01 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Fluoride

Interwell Parametric



Background Data Summary: Mean=0.457, Std. Dev.=0.1899, n=10, 10% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9406, critical = 0.781. Kappa = 2.39 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-17	MW-1R (bg)	MW-15R	MW-108	MW-101R
9/7/2016	0.53	0.89	0.48	0.4	0.59	0.45
8/24/2017	0.53	0.78	0.58	0.39	0.61	0.44
8/16/2018	0.49	0.62		0.32	0.68	0.49
4/6/2019			0.35 (J)			
8/7/2019	0.46 (J)	0.72	0.85	<0.23	0.9	<0.23
8/24/2020	0.43 (J)	<0.23	0.47 (J)		0.38 (J)	<0.23
8/25/2020				0.42 (J)		
8/10/2021		0.46 (J)	0.34 (J)			
8/11/2021	0.44 (J)				0.65	0.4 (J)
8/12/2021				<0.28		
8/23/2022			<0.22 (U)			
8/24/2022	<0.22 (U)			<0.22 (U)	<0.22 (U)	<0.22 (U)
8/29/2023	<0.38 (U)		0.4 (J)			0.42 (J)
8/30/2023				<0.38 (U)	<0.38 (U)	
8/6/2024	<0.38		0.46 (J)	<0.38		<0.38
8/7/2024					0.43 (J)	
8/5/2025	0.46 (J)			<0.38 (U)	0.5 (J)	
8/6/2025			0.53 (J)			0.44 (J)

ND substitution: RL or RL/2 if <15% NDs.

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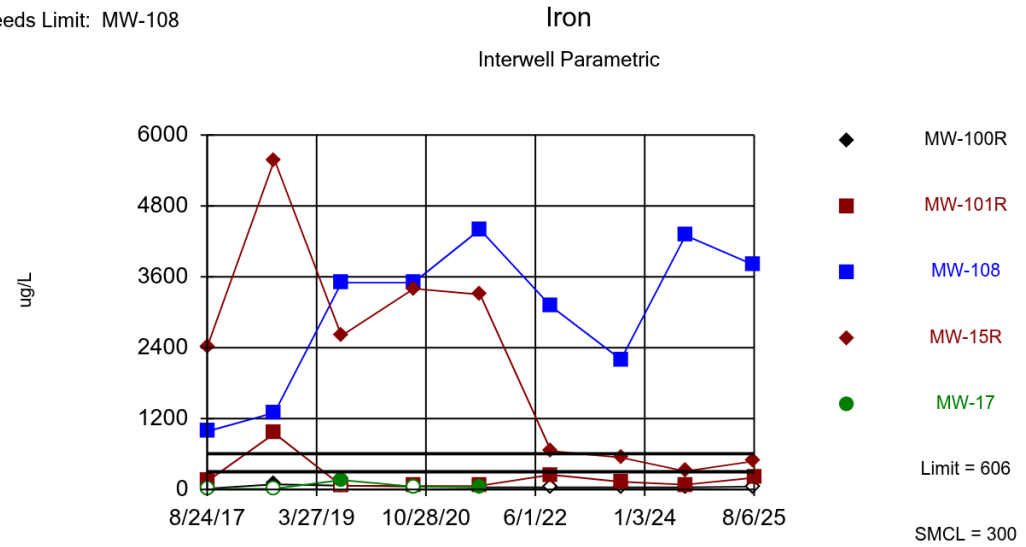
Hollow symbols indicate censored values.

Exceeds Limit: MW-108



Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=3.545, Std. Dev.=1.141, n=9, 44.44% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9096, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Iron (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	16.2 (J)	2410	12.5 (J)	<9.6	140	983
8/16/2018	86.3	5580		<14.9	949	1300
4/6/2019			380			
8/7/2019	<66	2600	<66	160	<66	3500
8/24/2020	<50		88 (J)	<50	60 (J)	3500
8/25/2020		3400				
8/10/2021			<36	48 (J)		
8/11/2021	<36				64 (J)	4400
8/12/2021		3300				
8/23/2022			64 (J)			
8/24/2022	<36 (U)	650			250	3100
8/29/2023	<36 (U)		<36 (U)		130	
8/30/2023		540				2200
8/6/2024	<36	310	46 (J)		82 (J)	
8/7/2024						4300
8/5/2025	<50 (U)	480				3800
8/6/2025			<50 (U)		200	

ND substitution: RL or RL/2 if <15% NDs.

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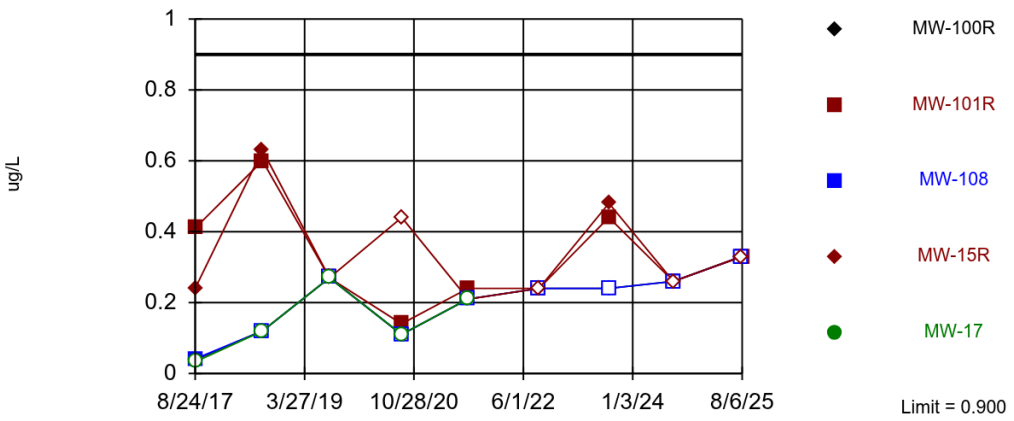
Hollow symbols indicate censored values.

Within Limit

Lead

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 55.56% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Lead (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

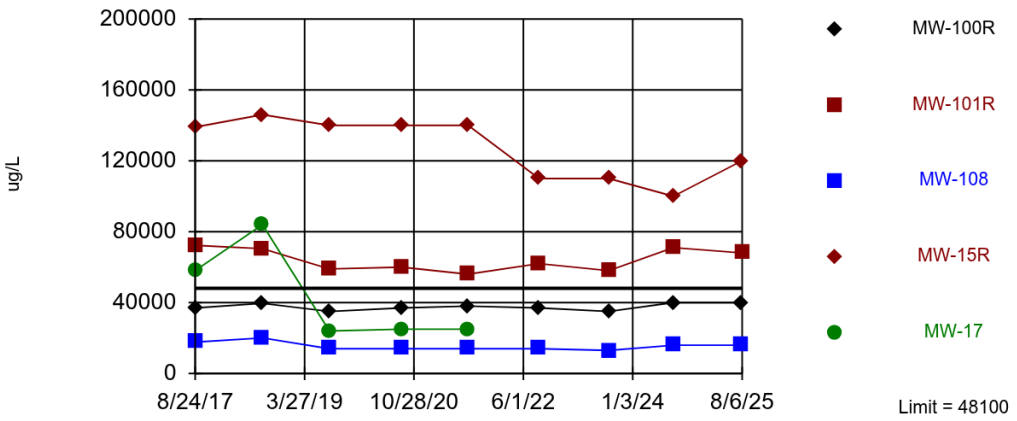
	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.039 (J)	0.24 (J)	0.18 (J)	<0.033	0.41 (J)	0.041 (J)
8/16/2018	<0.12	0.63 (J)		<0.12	0.6 (J)	<0.12
4/6/2019			0.71			
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.11		0.9	<0.11	0.14 (J)	<0.11
8/25/2020		<0.44				
8/10/2021			<0.21	<0.21		
8/11/2021	<0.21				0.24 (J)	<0.21
8/12/2021		<0.21				
8/23/2022			<0.24 (U)			
8/24/2022	<0.24 (U)	<0.24 (U)			<0.24 (U)	<0.24 (U)
8/29/2023	0.24 (JB)		0.29 (JB)		0.44 (JB)	
8/30/2023		0.48 (JB)				<0.24 (U)
8/6/2024	<0.26	<0.26	<0.26		<0.26	
8/7/2024						<0.26
8/5/2025	<0.33 (U)	<0.33 (U)				<0.33 (U)
8/6/2025			<0.33 (U)		<0.33 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Exceeds Limit: MW-101R, MW-15R

Magnesium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 9 background values. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	37000	139000	48100	58100	72300	17700
8/16/2018	39600	146000		84000	70400	20100
4/6/2019			31000			
8/7/2019	35000	140000	30000	24000	59000	14000
8/24/2020	37000		31000	25000	60000	14000
8/25/2020		140000				
8/10/2021			30000	25000		
8/11/2021	38000				56000	14000
8/12/2021		140000				
8/23/2022			31000			
8/24/2022	37000	110000			62000	14000
8/29/2023	35000		29000		58000	
8/30/2023		110000				13000
8/6/2024	40000	100000	28000		71000	
8/7/2024						16000
8/5/2025	40000	120000				16000
8/6/2025			31000		68000	

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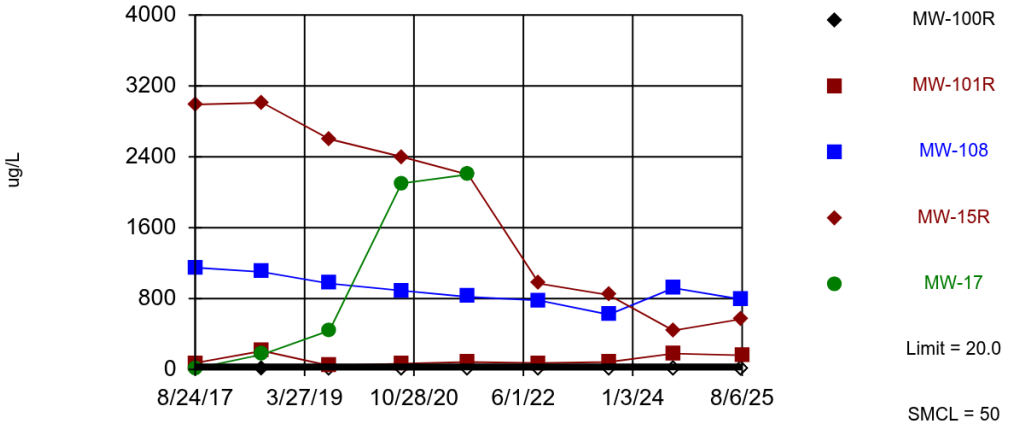
Hollow symbols indicate censored values.

Exceeds Limit: MW-101R, MW-108, MW-15R, MW-17

Manganese

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 55.56% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.9 (J)	2990	2	10.8	74.1	1150
8/16/2018	5.6	3010		170	210	1100
4/6/2019			20			
8/7/2019	<2.5	2600	2.8 (J)	440	44	970
8/24/2020	<4		4.7 (J)	2100	66	890
8/25/2020		2400				
8/10/2021			<4.4	2200		
8/11/2021	<4.4				84	820
8/12/2021		2200				
8/23/2022			<3.6 (U)			
8/24/2022	<3.6 (U)	970			73	780
8/29/2023	<3.6 (U)		<3.6 (U)		84	
8/30/2023		840				620
8/6/2024	<3.6	440	<3.6		180	
8/7/2024						920
8/5/2025	<3.6 (U)	570				790
8/6/2025			<3.6 (U)		160	

ND substitution: RL or RL/2 if <15% NDs.

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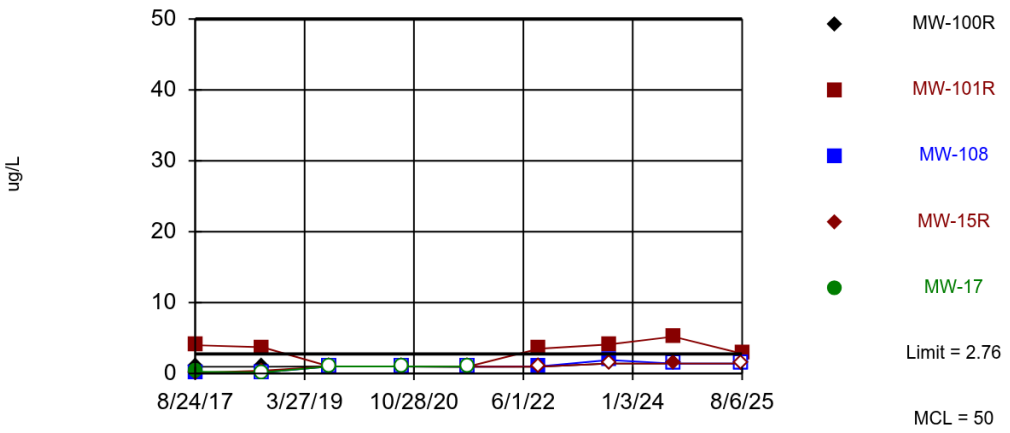
Hollow symbols indicate censored values.

Within Limit

Selenium

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=1.381, Std. Dev.=0.548, n=9, 33.33% NDs.
Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8248, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 11:52 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

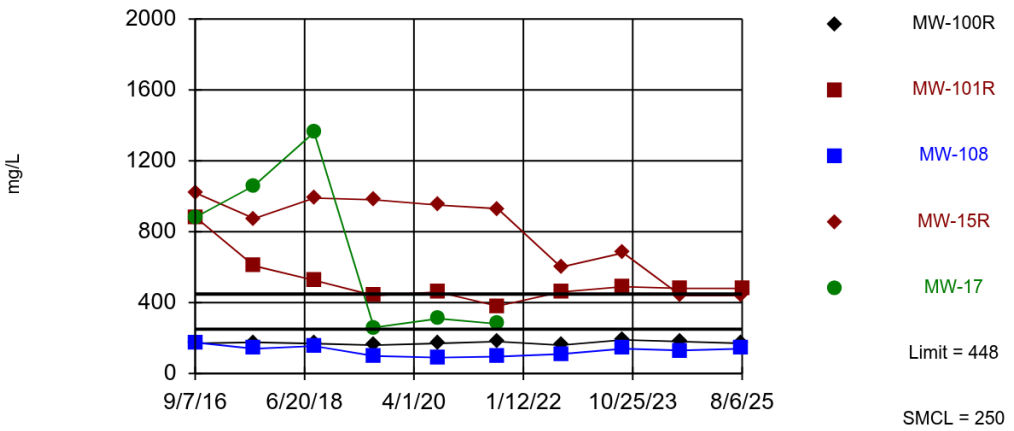
	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.95 (J)	<0.086	1.1	0.25 (J)	4	0.089 (J)
8/16/2018	0.95 (J)	0.4 (J)		<0.16	3.7	<0.16
4/6/2019			<1			
8/7/2019	<1	<1	1.4 (J)	<1	1 (J)	<1
8/24/2020	<1		2.1 (J)	<1	<1	<1
8/25/2020		<1				
8/10/2021			1.2 (J)	<0.96		
8/11/2021	<0.96				<0.96	<0.96
8/12/2021		<0.96				
8/23/2022			<0.96 (U)			
8/24/2022	0.97 (J)	<0.96 (U)			3.5 (J)	1 (J)
8/29/2023	1.4 (J)		2.6 (J)		4.1 (J)	
8/30/2023		<1.4 (U)				1.9 (J)
8/6/2024	<1.4	1.4 (J)	<1.4		5.2	
8/7/2024						<1.4
8/5/2025	<1.4 (U)	<1.4 (U)				<1.4 (U)
8/6/2025			1.4 (J)		2.8 (J)	

ND substitution: RL or RL/2 if <15% NDs.

Exceeds Limit: MW-101R

Sulfate

Interwell Parametric



Background Data Summary: Mean=214.8, Std. Dev.=120.9, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9043, critical = 0.894. Kappa = 1.927 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:50 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 11:52 AM View: Shallow Unit

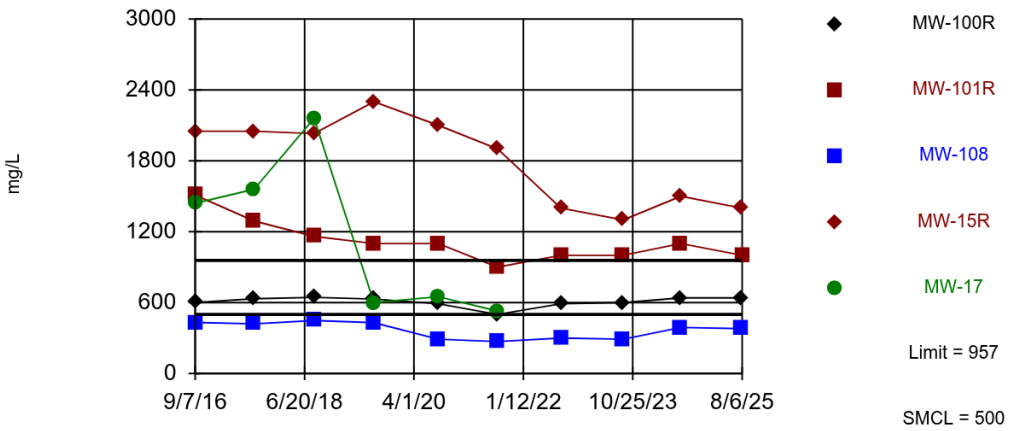
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-1R (bg)	MW-100R	MW-15R	MW-17	MW-101R	MW-108
9/29/1999	350					
9/13/2000	340					
9/19/2001	210					
9/11/2002	320					
9/10/2003	260					
9/15/2004	160					
9/14/2005	260					
9/13/2006	157					
9/12/2007	138					
9/17/2008	291					
9/16/2009	298					
8/31/2010	403					
9/13/2011	374					
9/18/2012	318					
9/27/2013	264					
9/10/2014	97.8					
9/2/2015	312					
9/7/2016	323	170	1020	881	883	175
8/24/2017	346	176	874	1060	607	140
8/16/2018		169	990	1360	526	155
4/6/2019	190					
8/7/2019	60	160	980	260	440	99
8/24/2020	50	170		310	460	90
8/25/2020			950			
8/10/2021	53			280		
8/11/2021		180			380	95
8/12/2021			930			
8/23/2022	28					
8/24/2022		160	600		460	110
8/29/2023	60	190			490	
8/30/2023			680			140
8/6/2024	80	180	440		480	
8/7/2024						130
8/5/2025		170	440			140
8/6/2025	57				480	

Exceeds Limit: MW-101R, MW-15R

Total Dissolved Solids

Interwell Parametric



Background Data Summary: Mean=561.5, Std. Dev.=165.5, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8155, critical = 0.781. Kappa = 2.39 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 11:52 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-17	MW-1R (bg)	MW-15R	MW-108	MW-101R
9/7/2016	601	1440	808	2050	432	1510
8/24/2017	633	1560	887	2050	420	1290
8/16/2018	644	2160		2030	448	1160
4/6/2019			640			
8/7/2019	630	600	530	2300	430	1100
8/24/2020	590	650	420		290	1100
8/25/2020				2100		
8/10/2021		530	420			
8/11/2021	500				270	900
8/12/2021				1900		
8/23/2022			440			
8/24/2022	590			1400	300	1000
8/29/2023	600		530			1000
8/30/2023				1300	290	
8/6/2024	640		470	1500		1100
8/7/2024					390	
8/5/2025	640			1400	380	
8/6/2025			470			1000

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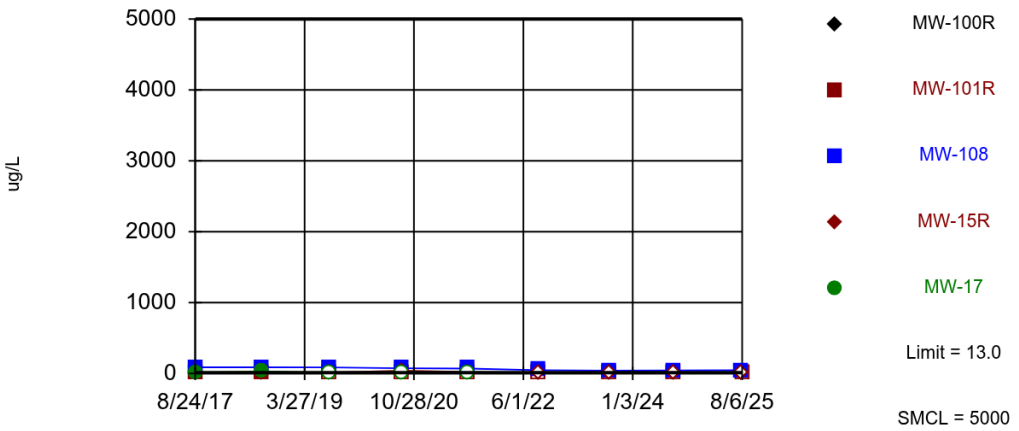
Hollow symbols indicate censored values.

Exceeds Limit: MW-108

Zinc

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 88.89% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 5 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:51 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 11:52 AM View: Shallow Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-100R	MW-15R	MW-1R (bg)	MW-17	MW-101R	MW-108
8/24/2017	0.88 (J)	1.5 (J)	2.4 (J)	10.4	1.8 (J)	87.8
8/16/2018	<3.7	6 (J)		31.4	6.7 (J)	88.1
4/6/2019			<10			
8/7/2019	<10	13 (J)	<10	<10	<10	86
8/24/2020	<10		<10	<10	<10	74
8/25/2020		<40				
8/10/2021			<10	<10		
8/11/2021	<10				<10	70
8/12/2021		23				
8/23/2022			<10 (U)			
8/24/2022	<10 (U)	<10 (U)			<10 (U)	47
8/29/2023	<6.4 (U)		<6.4 (U)		<6.4 (U)	
8/30/2023		<6.4 (U)				40
8/6/2024	<9.7	<9.7	<9.7		<9.7	
8/7/2024						43
8/5/2025	<13 (U)	<13 (U)				46
8/6/2025			<13 (U)		<13 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Attachment D6

Interwell Prediction Limit Analysis - Pennsylvanian

Prediction Limit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 11:46 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	MW-12	0.880	n/a	8/5/2025	0.53ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-13	0.880	n/a	8/5/2025	0.53ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-14	0.880	n/a	8/5/2025	1.2J	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-16R	0.880	n/a	8/6/2025	0.53ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Barium (ug/L)	MW-12	28.1	n/a	8/5/2025	17	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-13	28.1	n/a	8/5/2025	17	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	MW-14	28.1	n/a	8/5/2025	21	No	9	0	No	0.001754	Param Inter 1 of 2
Barium (ug/L)	**MW-16R**	**28.1**	**n/a**	**8/6/2025**	**37**	**Yes**	**9**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Beryllium (ug/L)	MW-12	1.30	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-13	1.30	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-14	1.30	n/a	8/5/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-16R	1.30	n/a	8/6/2025	0.33ND	No	9	88.89	n/a	0.01707	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-12	2130	n/a	8/5/2025	1300	No	9	0	No	0.001754	Param Inter 1 of 2
Boron (ug/L)	MW-13	2130	n/a	8/5/2025	1900	No	9	0	No	0.001754	Param Inter 1 of 2
Boron (ug/L)	MW-14	2130	n/a	8/5/2025	1900	No	9	0	No	0.001754	Param Inter 1 of 2
Boron (ug/L)	MW-16R	2130	n/a	8/6/2025	1900	No	9	0	No	0.001754	Param Inter 1 of 2
Chloride (mg/L)	**MW-12**	**9.9**	**n/a**	**8/5/2025**	**48**	**Yes**	**14**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-13**	**9.9**	**n/a**	**8/5/2025**	**13**	**Yes**	**14**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-14**	**9.9**	**n/a**	**8/5/2025**	**20**	**Yes**	**14**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-16R**	**9.9**	**n/a**	**8/6/2025**	**21**	**Yes**	**14**	**0**	**No**	**0.001754**	**Param Inter 1 of 2**
Cobalt (ug/L)	MW-12	1.64	n/a	8/5/2025	0.085ND	No	9	0	No	0.001754	Param Inter 1 of 2
Cobalt (ug/L)	MW-13	1.64	n/a	8/5/2025	1.2	No	9	0	No	0.001754	Param Inter 1 of 2
Cobalt (ug/L)	MW-14	1.64	n/a	8/5/2025	0.54	No	9	0	No	0.001754	Param Inter 1 of 2
Cobalt (ug/L)	MW-16R	1.64	n/a	8/6/2025	0.82	No	9	0	No	0.001754	Param Inter 1 of 2
Copper (ug/L)	MW-12	4.30	n/a	8/5/2025	3.8J	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-13	4.30	n/a	8/5/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-14	4.30	n/a	8/5/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-16R	4.30	n/a	8/6/2025	3.2ND	No	9	66.67	n/a	0.01707	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	**MW-12**	**1.02**	**n/a**	**8/5/2025**	**2.6**	**Yes**	**10**	**20**	**No**	**0.001754**	**Param Inter 1 of 2**
Fluoride (mg/L)	MW-13	1.02	n/a	8/5/2025	0.85J	No	10	20	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-14	1.02	n/a	8/5/2025	0.88J	No	10	20	No	0.001754	Param Inter 1 of 2
Fluoride (mg/L)	MW-16R	1.02	n/a	8/6/2025	0.6J	No	10	20	No	0.001754	Param Inter 1 of 2
Iron (ug/L)	MW-12	5500	n/a	8/5/2025	380	No	9	0	n/a	0.01707	NP Inter (normality) ...
Iron (ug/L)	MW-13	5500	n/a	8/5/2025	250	No	9	0	n/a	0.01707	NP Inter (normality) ...
Iron (ug/L)	MW-14	5500	n/a	8/5/2025	25ND	No	9	0	n/a	0.01707	NP Inter (normality) ...
Iron (ug/L)	MW-16R	5500	n/a	8/6/2025	490	No	9	0	n/a	0.01707	NP Inter (normality) ...
Lead (ug/L)	MW-12	1.10	n/a	8/5/2025	0.33ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-13	1.10	n/a	8/5/2025	0.33ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-14	1.10	n/a	8/5/2025	0.33ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-16R	1.10	n/a	8/6/2025	0.33ND	No	9	77.78	n/a	0.01707	NP Inter (NDs) 1 of 2
Magnesium (ug/L)	MW-12	198000	n/a	8/5/2025	5900	No	9	0	No	0.001754	Param Inter 1 of 2
Magnesium (ug/L)	MW-13	198000	n/a	8/5/2025	64000	No	9	0	No	0.001754	Param Inter 1 of 2
Magnesium (ug/L)	MW-14	198000	n/a	8/5/2025	35000	No	9	0	No	0.001754	Param Inter 1 of 2
Magnesium (ug/L)	MW-16R	198000	n/a	8/6/2025	38000	No	9	0	No	0.001754	Param Inter 1 of 2
Manganese (ug/L)	MW-12	574	n/a	8/5/2025	26	No	9	0	n/a	0.01707	NP Inter (normality) ...
Manganese (ug/L)	MW-13	574	n/a	8/5/2025	210	No	9	0	n/a	0.01707	NP Inter (normality) ...
Manganese (ug/L)	MW-14	574	n/a	8/5/2025	140	No	9	0	n/a	0.01707	NP Inter (normality) ...
Manganese (ug/L)	MW-16R	574	n/a	8/6/2025	220	No	9	0	n/a	0.01707	NP Inter (normality) ...
Selenium (ug/L)	MW-12	1.40	n/a	8/5/2025	1.4ND	No	9	100	n/a	0.01707	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-13	1.40	n/a	8/5/2025	1.4ND	No	9	100	n/a	0.01707	NP Inter (NDs) 1 of 2

Prediction Limit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/7/2025, 11:46 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Selenium (ug/L)	MW-14	1.40	n/a	8/5/2025	2.2J	No	9	100	n/a	0.01707	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-16R	1.40	n/a	8/6/2025	1.4ND	No	9	100	n/a	0.01707	NP Inter (NDs) 1 of 2
Sulfate (mg/L)	MW-12	2200	n/a	8/5/2025	800	No	14	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-13	2200	n/a	8/5/2025	1600	No	14	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-14	2200	n/a	8/5/2025	870	No	14	0	No	0.001754	Param Inter 1 of 2
Sulfate (mg/L)	MW-16R	2200	n/a	8/6/2025	900	No	14	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-12	3460	n/a	8/5/2025	1700	No	9	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-13	3460	n/a	8/5/2025	2200	No	9	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-14	3460	n/a	8/5/2025	2000	No	9	0	No	0.001754	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-16R	3460	n/a	8/6/2025	2100	No	9	0	No	0.001754	Param Inter 1 of 2
Zinc (ug/L)	MW-12	25.5	n/a	8/5/2025	13ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Zinc (ug/L)	MW-13	25.5	n/a	8/5/2025	13ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Zinc (ug/L)	MW-14	25.5	n/a	8/5/2025	13ND	No	9	33.33	No	0.001754	Param Inter 1 of 2
Zinc (ug/L)	MW-16R	25.5	n/a	8/6/2025	13ND	No	9	33.33	No	0.001754	Param Inter 1 of 2

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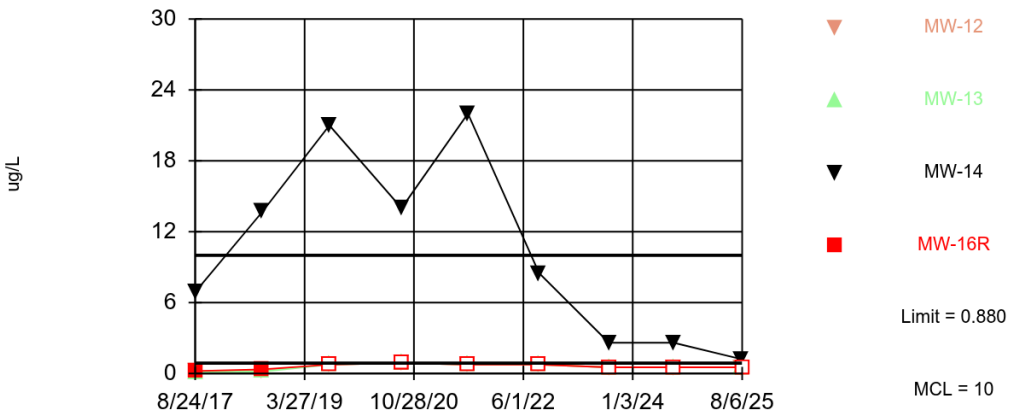
Hollow symbols indicate censored values.

Within Limit

Arsenic

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 77.78% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Arsenic (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

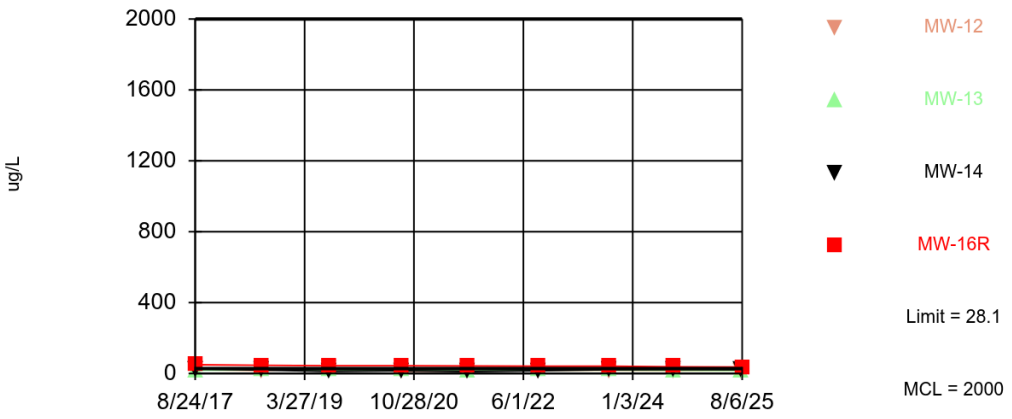
	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	0.61 (J)	0.12 (J)	0.19 (J)	0.21 (J)	6.9
8/16/2018	0.66 (J)	0.16 (J)	0.27 (J)	0.35 (J)	13.7
8/7/2019	<0.75	<0.75	<0.75	<0.75	21
8/24/2020	<0.88	<0.88	<0.88		14
8/25/2020				<0.88	
8/10/2021			<0.75		
8/11/2021	<0.75	<0.75		<0.75	22
8/24/2022	<0.75 (U)	<0.75 (U)	<0.75 (U)	<0.75 (U)	8.5
8/29/2023	<0.53 (U)		<0.53 (U)	<0.53 (U)	
8/30/2023		<0.53 (U)			2.6
8/7/2024	<0.53			<0.53	2.6
8/8/2024		<0.53	<0.53		
8/5/2025		<0.53 (U)	<0.53 (U)		1.2 (J)
8/6/2025	<0.53 (U)			<0.53 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Exceeds Limit: MW-16R

Barium

Interwell Parametric



Background Data Summary: Mean=23.99, Std. Dev.=1.625, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8899, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Barium (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	22.7	18.2	21	49.7	26.8
8/16/2018	25.2	19.9	15.5	46.4	19.3
8/7/2019	24	19	32	44	12
8/24/2020	22	20	12		16
8/25/2020				44	
8/10/2021			15 (B)		
8/11/2021	22 (B)	16 (B)		42 (B)	11 (B)
8/24/2022	26	19	17	41	16
8/29/2023	25		18	41	
8/30/2023		19			22
8/7/2024	23			38	23
8/8/2024		18	15		
8/5/2025		17	17		21
8/6/2025	26 (B)			37 (B)	

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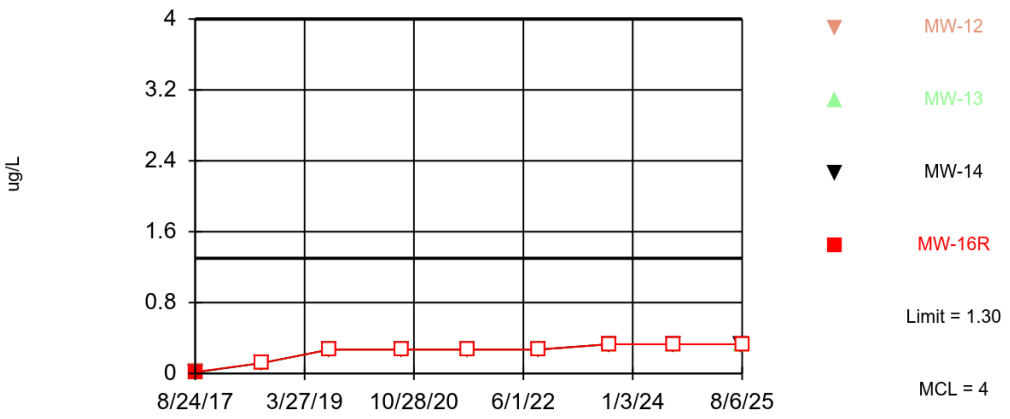
Hollow symbols indicate censored values.

Within Limit

Beryllium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 88.89% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Beryllium (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

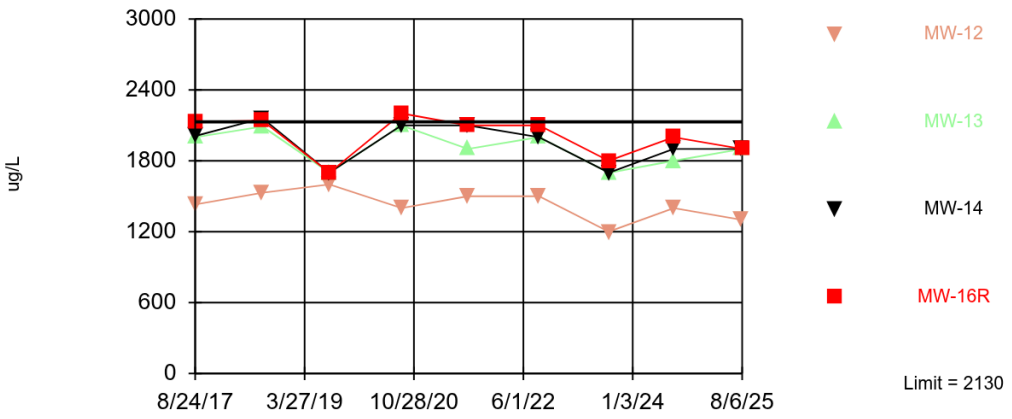
	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	0.013 (J)	<0.012	0.019 (J)	0.016 (J)	<0.012
8/16/2018	<0.12	<0.12	<0.12	<0.12	<0.12
8/7/2019	<0.27	<0.27	<0.27	<0.27	<0.27
8/24/2020	<0.27	<0.27	<0.27		<0.27
8/25/2020				<0.27	
8/10/2021			<0.27		
8/11/2021	<0.27	<0.27		<0.27	<0.27
8/24/2022	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)
8/29/2023	<1.3 (U)		<0.33 (U)	<0.33 (U)	
8/30/2023		<0.33 (U)			<0.33 (U)
8/7/2024	<0.33			<0.33	<0.33
8/8/2024		<0.33	<0.33		
8/5/2025		<0.33 (U)	<0.33 (U)		<0.33 (U)
8/6/2025	<0.33 (U)			<0.33 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Within Limit

Boron

Interwell Parametric



Background Data Summary: Mean=1654, Std. Dev.=188.6, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9186, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:42 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

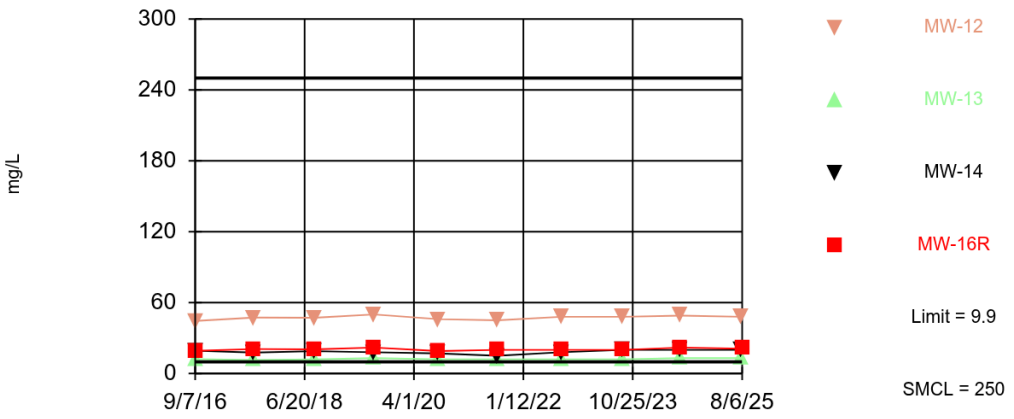
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	1770	2000	1430	2130	2010
8/16/2018	1920	2090	1530	2140	2160
8/7/2019	1400 (B)	1700 (B)	1600 (B)	1700 (B)	1700 (B)
8/24/2020	1800	2100	1400		2100
8/25/2020				2200	
8/10/2021			1500		
8/11/2021	1800	1900		2100	2100
8/24/2022	1600	2000	1500	2100	2000
8/29/2023	1400		1200	1800	
8/30/2023		1700			1700
8/7/2024	1700			2000	1900
8/8/2024		1800	1400		
8/5/2025		1900	1300		1900
8/6/2025	1500			1900	

Exceeds Limit: MW-12, MW-13, MW-14, MW-16R

Chloride

Interwell Parametric



Background Data Summary: Mean=8.95, Std. Dev.=0.4398, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9595, critical = 0.825. Kappa = 2.17 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-16R	MW-14	MW-13	MW-12
9/2/2015	8.6				
12/30/2015	8.6				
3/23/2016	9.3				
6/21/2016	8.5				
9/7/2016	8.8	19.2	19.3	12.1	44.5
8/24/2017	8.6	20.7	17.7	11.5	47.4
8/16/2018	8.8	20.4	18.9	11.9	47.2
8/7/2019	9.1	22	18	13	50
8/24/2020	8.2		17	12	46
8/25/2020		19			
8/10/2021					45
8/11/2021	8.9	20	15	12	
8/24/2022	9.3	20	18	12	48
8/29/2023	9.5	20			48
8/30/2023			20	12	
8/7/2024	9.4	22	20		
8/8/2024				13	49
8/5/2025			20	13	48
8/6/2025	9.7	21			

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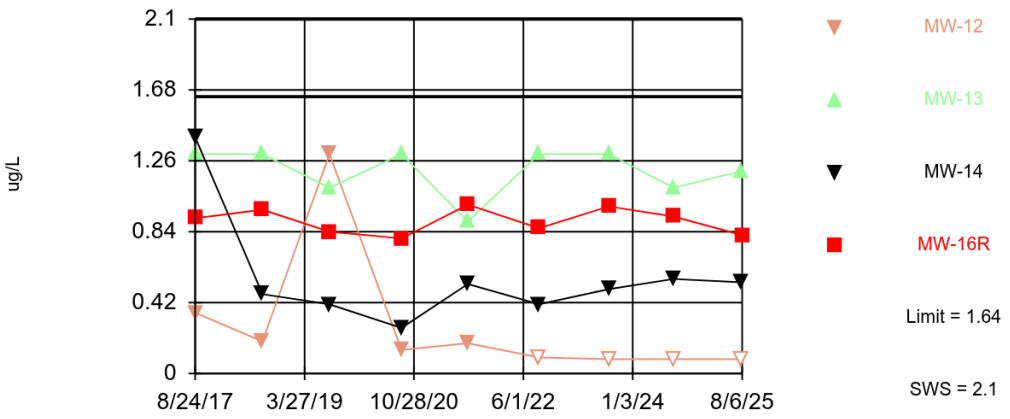
Hollow symbols indicate censored values.

Within Limit

Cobalt

Interwell Parametric



Background Data Summary: Mean=1.052, Std. Dev.=0.2333, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9187, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Cobalt (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	0.86 (J)	1.3	0.36 (J)	0.92 (J)	1.4
8/16/2018	1.1	1.3	0.19 (J)	0.97 (J)	0.47 (J)
8/7/2019	1.3 (J)	1.1	1.3	0.84	0.41 (J)
8/24/2020	0.93	1.3	0.14 (J)		0.27 (J)
8/25/2020				0.8	
8/10/2021			0.18 (J)		
8/11/2021	0.97	0.9		1	0.53
8/24/2022	1.4	1.3	<0.19 (U)	0.86	0.41 (J)
8/29/2023	0.87		<0.17 (U)	0.99	
8/30/2023		1.3			0.5
8/7/2024	0.74			0.93	0.56
8/8/2024		1.1	<0.17		
8/5/2025		1.2	<0.17 (U)		0.54
8/6/2025	1.3			0.82	

ND substitution: RL or RL/2 if <15% NDs.

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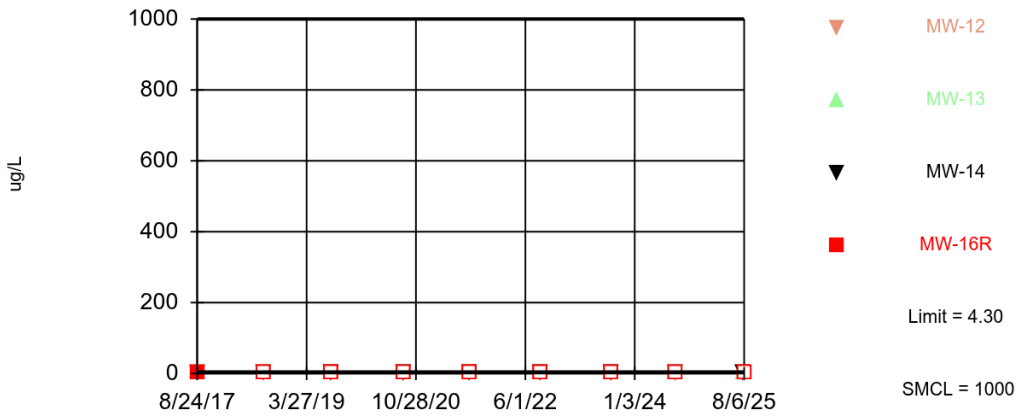
Hollow symbols indicate censored values.

Within Limit

Copper

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 66.67% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Copper (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	0.23 (J)	0.62 (J)	0.94 (J)	0.97 (J)	0.54 (J)
8/16/2018	<0.48	<0.48	<0.48	<0.48	0.6 (J)
8/7/2019	<2	<2	<2	<2	<2
8/24/2020	<1.5	<1.5	<1.5		<1.5
8/25/2020				<1.5	
8/10/2021			<1.4		
8/11/2021	<1.4	<1.4		<1.4	<1.4
8/24/2022	<1.8 (U)	<1.8 (U)	<1.8 (U)	<1.8 (U)	<1.8 (U)
8/29/2023	2.7 (J)		<1.8 (U)	<1.8 (U)	
8/30/2023		<1.8 (U)			<1.8 (U)
8/7/2024	4.3 (J)			<1.8	2.1 (J)
8/8/2024		<1.8	<1.8		
8/5/2025		<3.2 (U)	3.8 (J)		<3.2 (U)
8/6/2025	<3.2 (U)			<3.2 (U)	

ND substitution: RL or RL/2 if <15% NDs.

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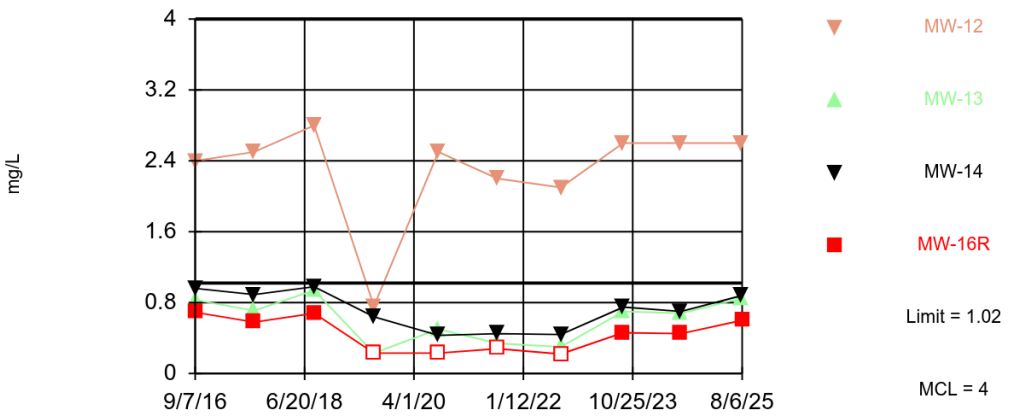
Hollow symbols indicate censored values.

Exceeds Limit: MW-12

Fluoride

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.479, Std. Dev.=0.2283, n=10, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8657, critical = 0.781. Kappa = 2.39 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-14	MW-16R	MW-12	MW-13
9/7/2016	0.84	0.96	0.69	2.4	0.83
8/24/2017	0.74	0.89	0.58	2.5	0.71
8/16/2018	0.69	0.98	0.68	2.8	0.94
8/7/2019	<0.23	0.64	<0.23	0.76	<0.23
8/24/2020	0.69	0.43 (J)		2.5	0.5
8/25/2020			<0.23		
8/10/2021				2.2	
8/11/2021	<0.28	0.45 (J)	<0.28		0.34 (J)
8/24/2022	0.23 (J)	0.44 (J)	<0.22 (U)	2.1	0.3 (J)
8/29/2023	0.58 (J)		0.46 (J)	2.6	
8/30/2023		0.75 (J)			0.7 (J)
8/7/2024	0.53 (J)	0.7 (J)	0.45 (J)		
8/8/2024				2.6	0.68 (J)
8/5/2025		0.88 (J)		2.6	0.85 (J)
8/6/2025	0.69 (J)		0.6 (J)		

ND substitution: RL or RL/2 if <15% NDs.

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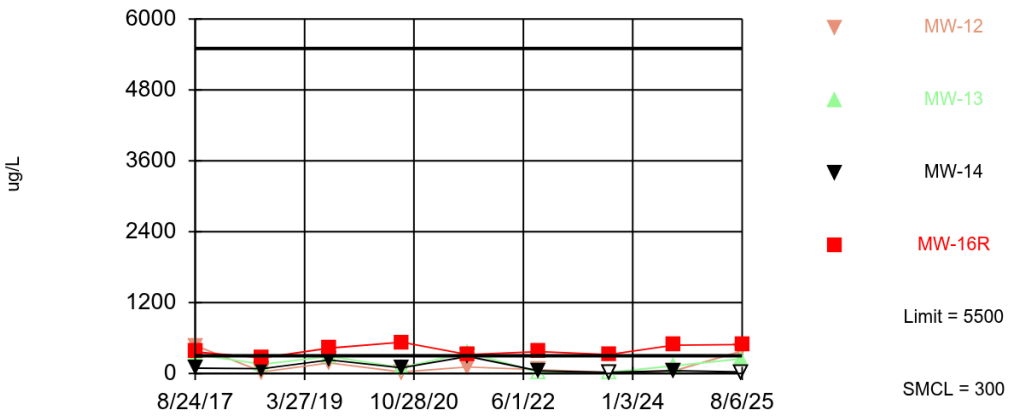
Hollow symbols indicate censored values.

Within Limit

Iron

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 9 background values. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Iron (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	5230	324	473	365	91.5
8/16/2018	5330	155	27.1 (J)	266	81.8
8/7/2019	5200	290	180	430	230
8/24/2020	5500	98 (J)	<50		97 (J)
8/25/2020				530	
8/10/2021			110		
8/11/2021	5500	360		320	290
8/24/2022	2200	<36 (U)	63 (J)	370	43 (J)
8/29/2023	3400		<36 (U)	320	
8/30/2023		<36 (U)			<36 (U)
8/7/2024	5500			480	47 (J)
8/8/2024		130	43 (J)		
8/5/2025		250	380		<50 (U)
8/6/2025	3300			490	

ND substitution: RL or RL/2 if <15% NDs.

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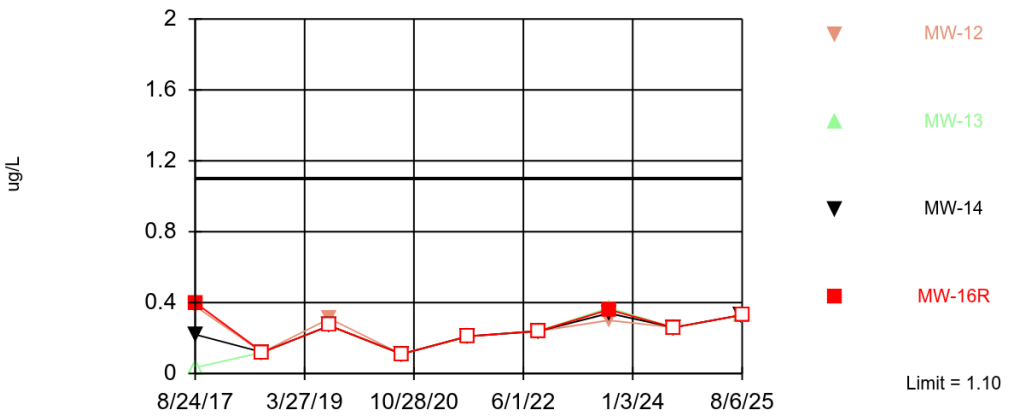
Hollow symbols indicate censored values.

Within Limit

Lead

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 77.78% NDs. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Lead (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

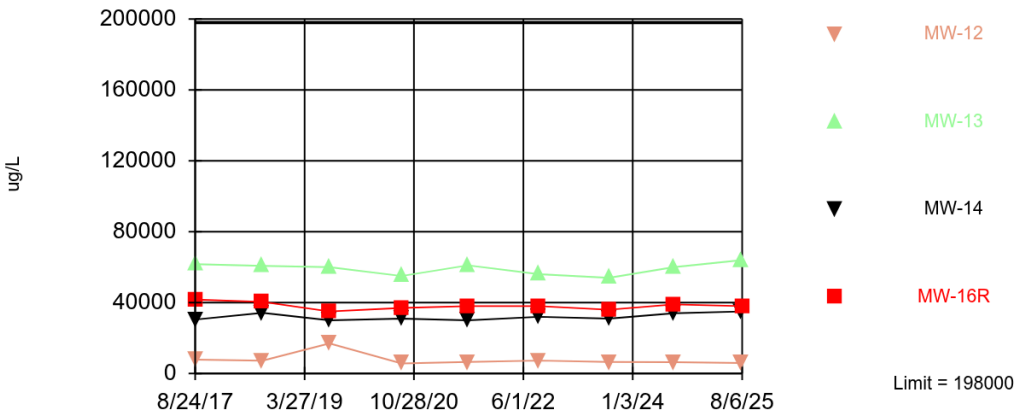
	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	0.036 (J)	<0.033	0.38 (J)	0.4 (J)	0.22 (J)
8/16/2018	<0.12	<0.12	<0.12	<0.12	0.12 (J)
8/7/2019	<1.1	<0.27	0.31 (J)	<0.27	<0.27
8/24/2020	<0.44	<0.11	<0.11		<0.11
8/25/2020				<0.11	
8/10/2021			0.21 (J)		
8/11/2021	<0.21	<0.21		<0.21	<0.21
8/24/2022	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)
8/29/2023	0.27 (JB)		0.3 (JB)	0.36 (JB)	
8/30/2023		0.37 (JB)			0.34 (JB)
8/7/2024	<0.26			<0.26	<0.26
8/8/2024		<0.26	<0.26		
8/5/2025		<0.33 (U)	<0.33 (U)		<0.33 (U)
8/6/2025	<0.33 (U)			<0.33 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Within Limit

Magnesium

Interwell Parametric



Background Data Summary: Mean=149667, Std. Dev.=19196, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8671, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Magnesium (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

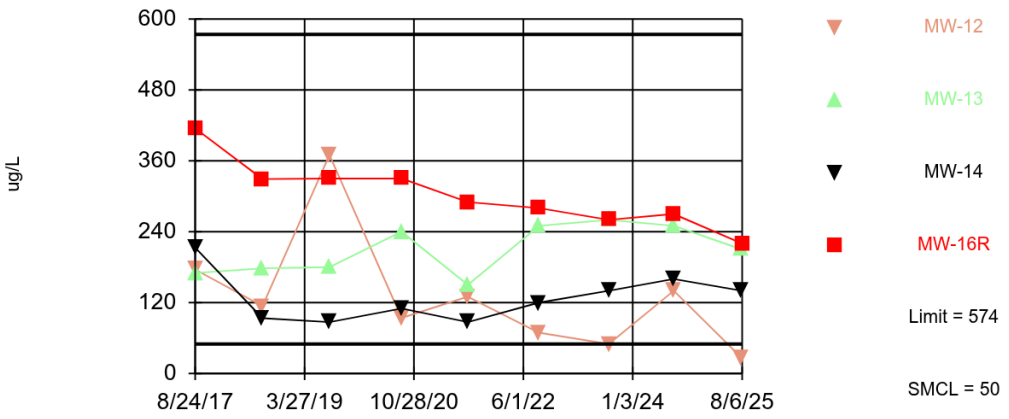
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	157000	61700	7830	41700	30400
8/16/2018	170000	60700	7230	40400	34200
8/7/2019	170000	60000	17000	35000	30000
8/24/2020	160000	55000	5700		31000
8/25/2020				37000	
8/10/2021			6500		
8/11/2021	160000	61000		38000	30000
8/24/2022	120000	56000	7300	38000	32000
8/29/2023	120000		6500	36000	
8/30/2023		54000			31000
8/7/2024	150000			39000	34000
8/8/2024		60000	6400		
8/5/2025		64000	5900		35000
8/6/2025	140000			38000	

Within Limit

Manganese

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 9 background values. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Manganese (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	558	170	176	415	213
8/16/2018	574	178	114	329	93.7
8/7/2019	550	180	370	330	87
8/24/2020	550	240	94		110
8/25/2020				330	
8/10/2021			130		
8/11/2021	510	150		290	87
8/24/2022	330	250	69	280	120
8/29/2023	340		50	260	
8/30/2023		260			140
8/7/2024	530			270	160
8/8/2024		250	140		
8/5/2025		210	26		140
8/6/2025	340			220	

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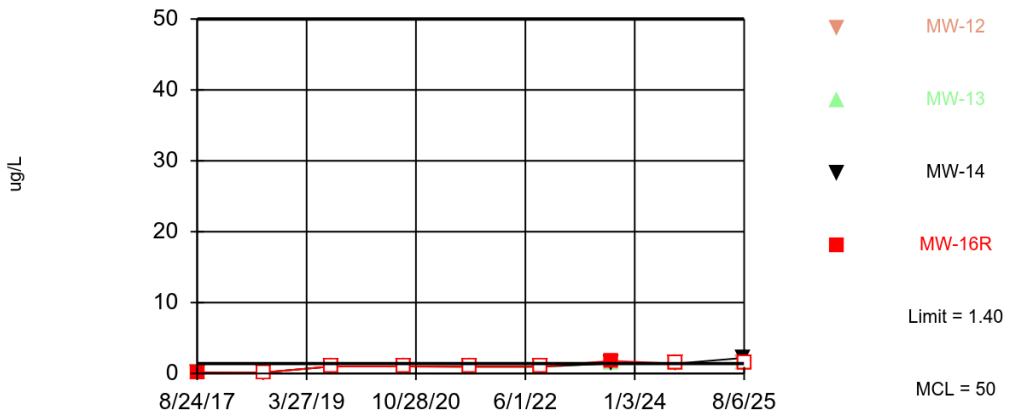
Hollow symbols indicate censored values.

Within Limit

Selenium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 9) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.06656. Individual comparison alpha = 0.01707 (1 of 2). Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Selenium (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

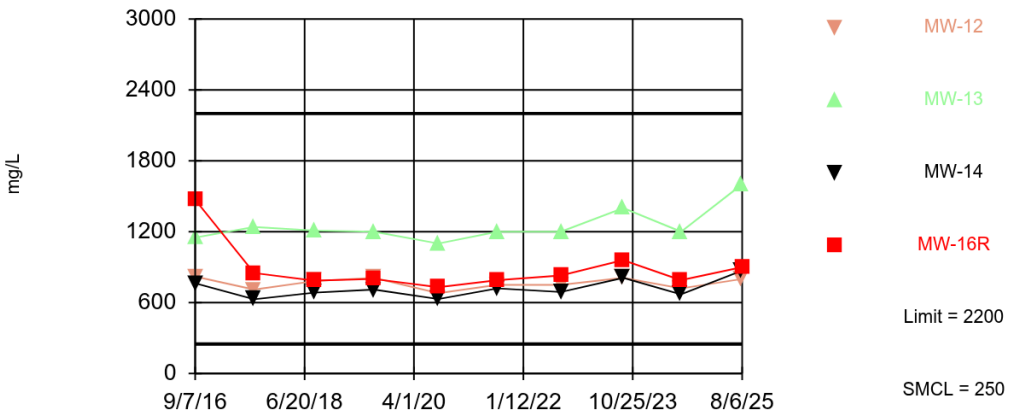
	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	<0.086	<0.086	<0.086	0.099 (J)	0.16 (J)
8/16/2018	<0.16	<0.16	<0.16	<0.16	<0.16
8/7/2019	<1	<1	<1	<1	<1
8/24/2020	<1	<1	<1		<1
8/25/2020				<1	
8/10/2021			<0.96		
8/11/2021	<0.96	<0.96		<0.96	<0.96
8/24/2022	<0.96 (U)	<0.96 (U)	<0.96 (U)	<0.96 (U)	<0.96 (U)
8/29/2023	<1.4 (U)		1.4 (J)	1.8 (J)	
8/30/2023		<1.4 (U)			<1.4 (U)
8/7/2024	<1.4			<1.4	<1.4
8/8/2024		<1.4	<1.4		
8/5/2025		<1.4 (U)	<1.4 (U)		2.2 (J)
8/6/2025	<1.4 (U)			<1.4 (U)	

ND substitution: RL or RL/2 if <15% NDs.

Within Limit

Sulfate

Interwell Parametric



Background Data Summary: Mean=1601, Std. Dev.=275.7, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9734, critical = 0.825. Kappa = 2.17 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

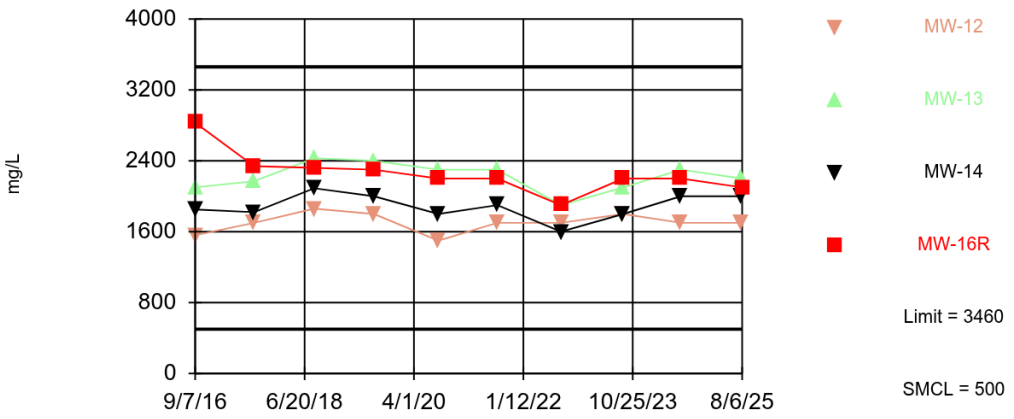
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-16R	MW-14	MW-13	MW-12
9/2/2015	1690				
12/30/2015	2070				
3/23/2016	1860				
6/21/2016	1840				
9/7/2016	1920	1470	764	1150	821
8/24/2017	1540	850	628	1240	710
8/16/2018	1690	786	684	1210	782
8/7/2019	1600	800	710	1200	810
8/24/2020	1500		630	1100	680
8/25/2020		730			
8/10/2021					750
8/11/2021	1500	790	720	1200	
8/24/2022	1000	830	690	1200	750
8/29/2023	1500	960			810
8/30/2023			810	1400	
8/7/2024	1400	790	670		
8/8/2024				1200	720
8/5/2025			870	1600	800
8/6/2025	1300	900			

Within Limit

Total Dissolved Solids

Interwell Parametric



Background Data Summary: Mean=2709, Std. Dev.=300, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9362, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-16R	MW-12	MW-14
9/7/2016	2890	2100	2830	1560	1850
8/24/2017	2760	2170	2340	1700	1820
8/16/2018	2730	2430	2320	1860	2090
8/7/2019	3100	2400	2300	1800	2000
8/24/2020	3000	2300		1500	1800
8/25/2020			2200		
8/10/2021				1700	
8/11/2021	310 (X)	2300	2200		1900
8/24/2022	2200	1900	1900	1700	1600
8/29/2023	2600		2200	1800	
8/30/2023		2100			1800
8/7/2024	2800		2200		2000
8/8/2024		2300		1700	
8/5/2025		2200		1700	2000
8/6/2025	2300		2100		

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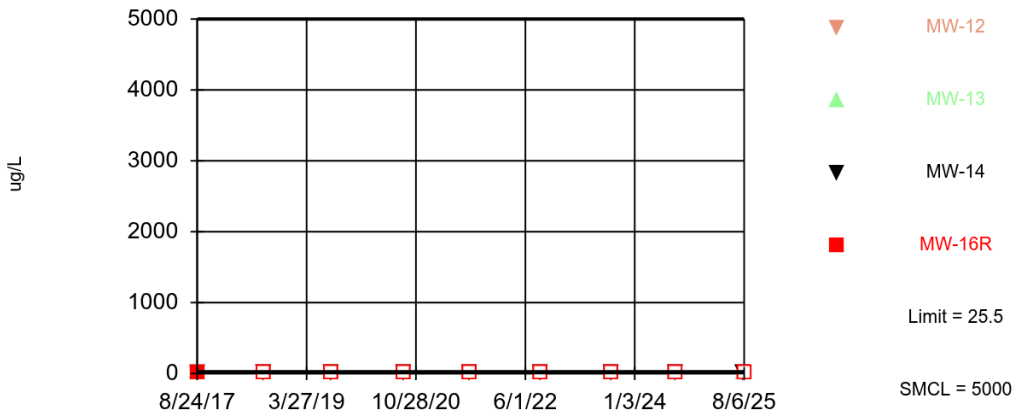
Hollow symbols indicate censored values.

Within Limit

Zinc

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=9.458, Std. Dev.=6.375, n=9, 33.33% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8299, critical = 0.764. Kappa = 2.51 (c=15, w=4, 1 of 2, event alpha = 0.1). Report alpha = 0.006999. Individual comparison alpha = 0.001754. Comparing 4 points to limit.

Prediction Limit Analysis Run 10/7/2025 11:43 AM View: Pennsylvanian Unit

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Prediction Limit

Constituent: Zinc (ug/L) Analysis Run 10/7/2025 11:46 AM View: Pennsylvanian Unit
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-102P (bg)	MW-13	MW-12	MW-16R	MW-14
8/24/2017	3.6 (J)	2 (J)	3.7 (J)	1 (J)	1.7 (J)
8/16/2018	4.3 (J)	<3.7	<3.7	<3.7	<3.7
8/7/2019	<10	<10	<10	<10	<10
8/24/2020	<40	<10	<10		<10
8/25/2020				<10	
8/10/2021			<10		
8/11/2021	<10	<10		<10	<10
8/24/2022	21	<10 (U)	<10 (U)	<10 (U)	<10 (U)
8/29/2023	6.9 (J)		<6.4 (U)	<6.4 (U)	
8/30/2023		<6.4 (U)			<6.4 (U)
8/7/2024	12 (J)			<9.7	<9.7
8/8/2024		<9.7	<9.7		
8/5/2025		<13 (U)	<13 (U)		<13 (U)
8/6/2025	18 (J)			<13 (U)	

ND substitution: RL or RL/2 if <15% NDs.

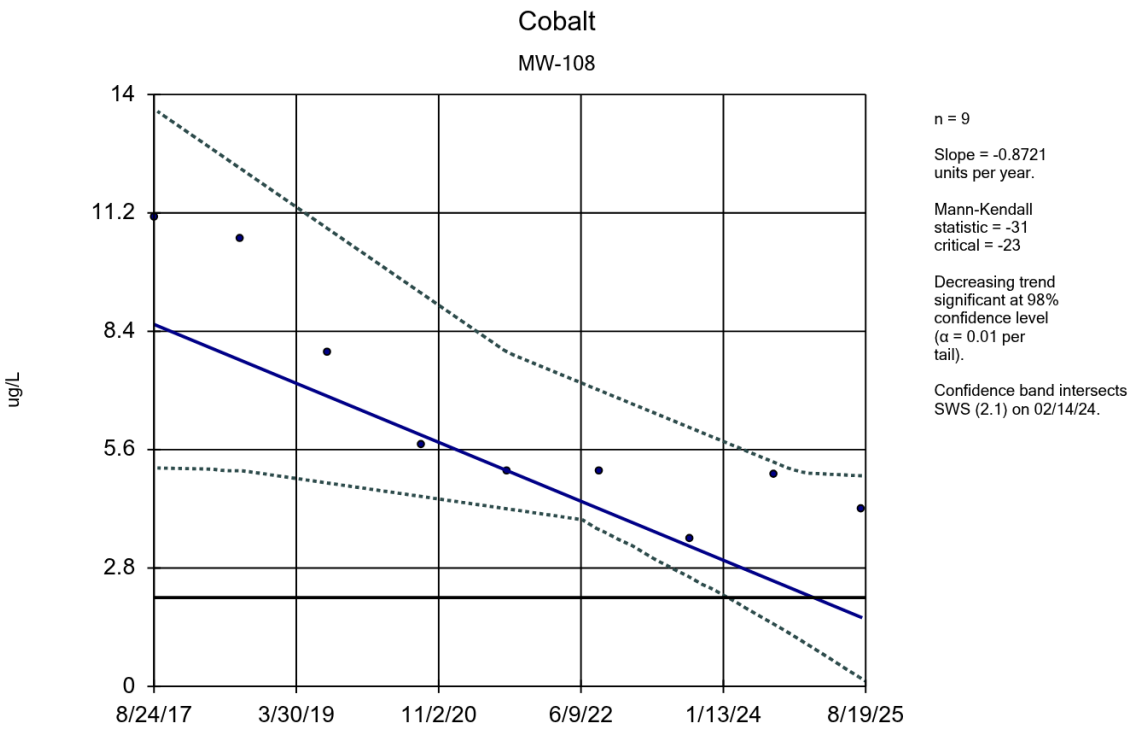
Appendix E

Groundwater Quality Trend Summary

Trend Test

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State Printed 10/10/2025, 11:35 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt (ug/L)	**MW-108**	**-0.8721**	**-31**	**-23**	**Yes**	**9**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Cobalt (ug/L)	MW-15R	0.09839	6	23	No	9	0	n/a	n/a	0.02	NP
Manganese (ug/L)	**MW-108**	**-67.45**	**-24**	**-23**	**Yes**	**9**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Manganese (ug/L)	**MW-15R**	**-361.9**	**-32**	**-23**	**Yes**	**9**	**0**	**n/a**	**n/a**	**0.02**	**NP**



Sen's Slope and 95% Confidence Band Analysis Run 10/10/2025 11:34 AM

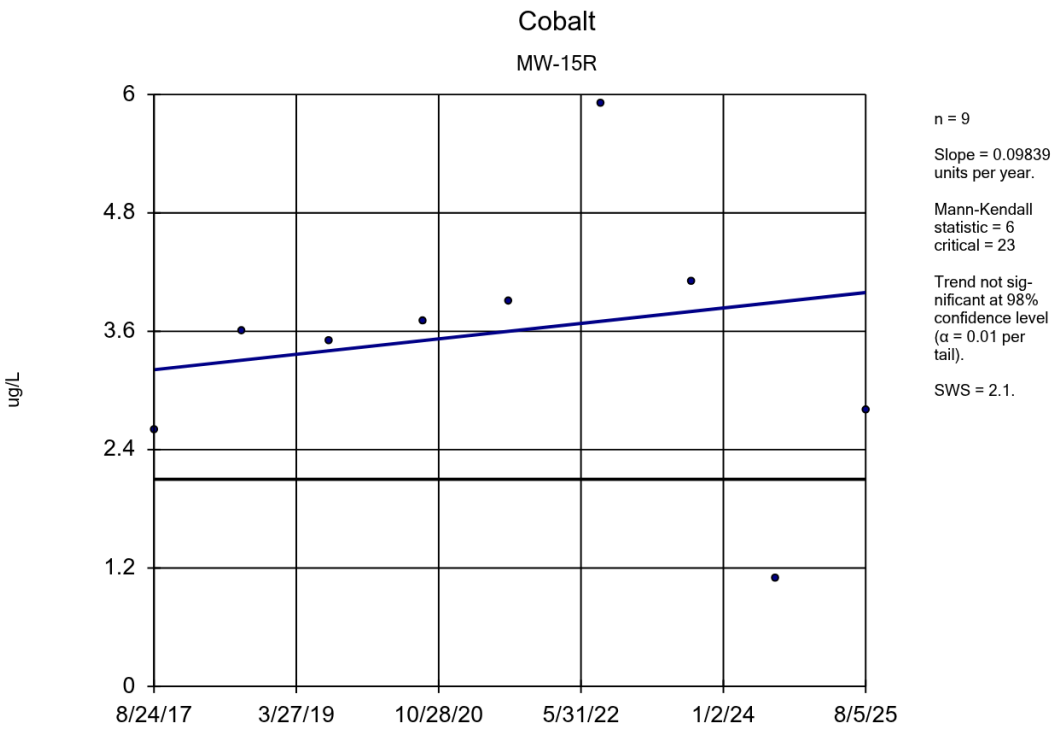
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 10/10/2025 11:35 AM

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-108	LCL	UCL
8/24/2017	11.1	5.168	13.66
8/16/2018	10.6	5.1	12.24
8/7/2019	7.9	4.81	10.82
8/24/2020	5.7	4.492	9.3
8/11/2021	5.1	4.2	7.9
8/24/2022	5.1	3.704	7.002
8/30/2023	3.5	2.581	6.12
8/7/2024	5	1.474	5.304
8/5/2025	4.2	0.175	4.981



Sen's Slope and 95% Confidence Band Analysis Run 10/10/2025 11:34 AM

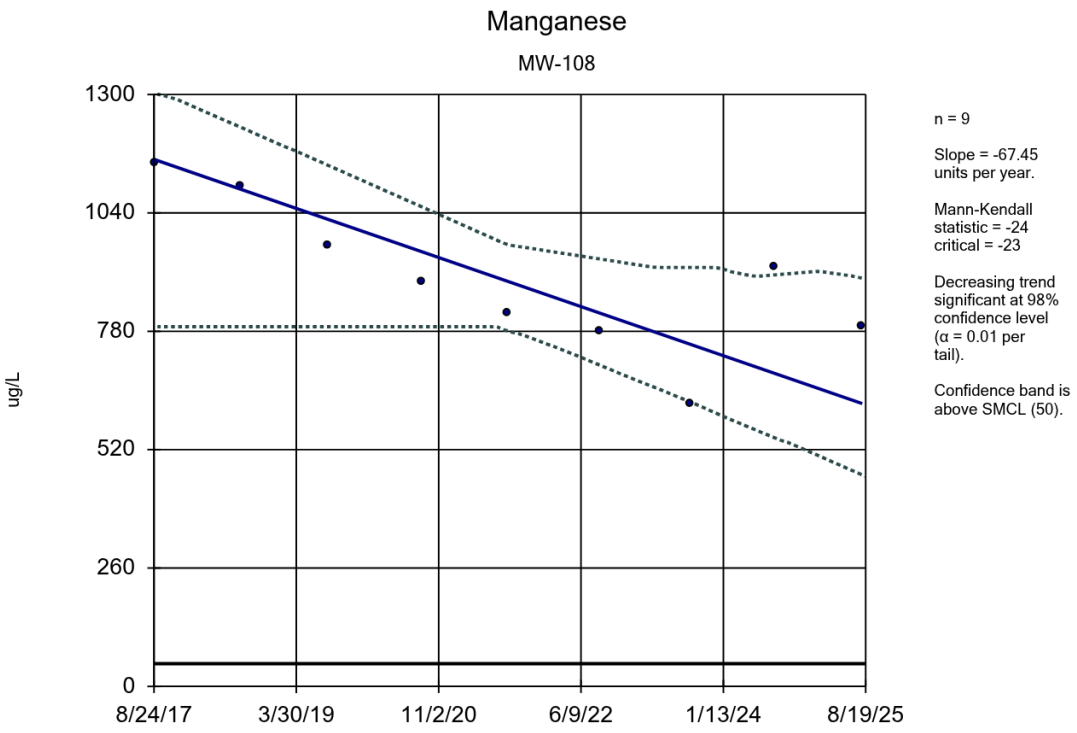
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 10/10/2025 11:35 AM

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-15R
8/24/2017	2.6
8/16/2018	3.6
8/7/2019	3.5
8/25/2020	3.7
8/12/2021	3.9
8/24/2022	5.9
8/30/2023	4.1
8/6/2024	1.1
8/5/2025	2.8



Sen's Slope and 95% Confidence Band Analysis Run 10/10/2025 11:34 AM

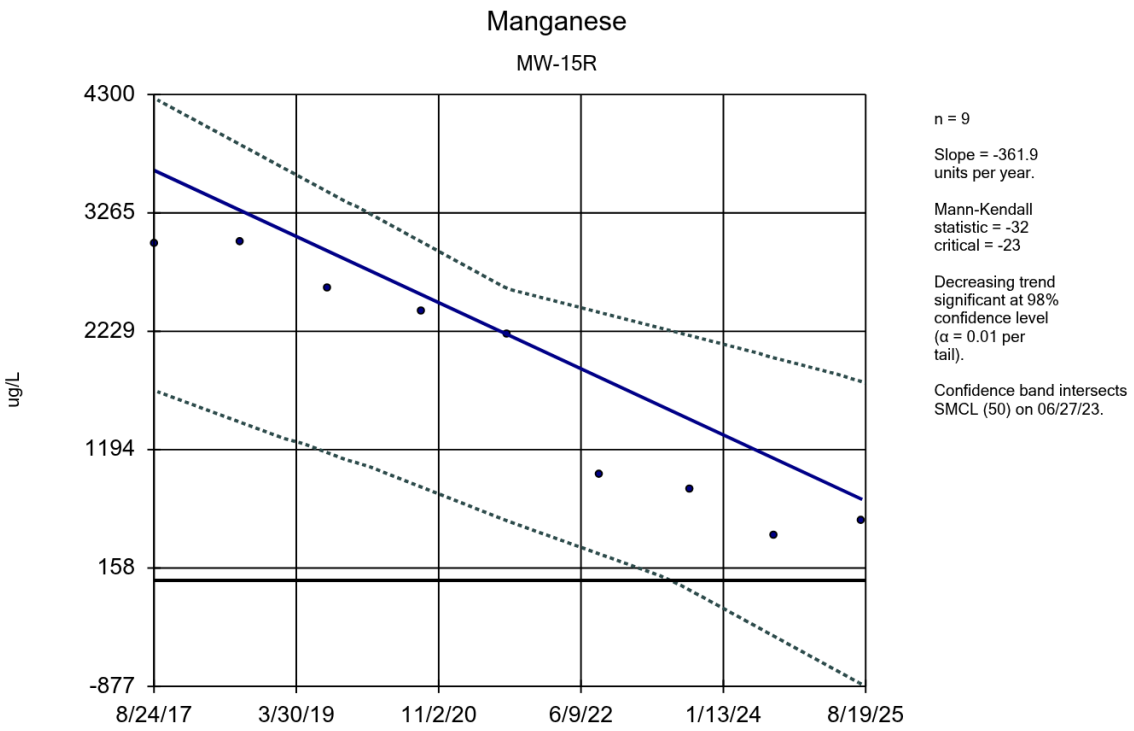
Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 10/10/2025 11:35 AM

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-108	LCL	UCL
8/24/2017	1150	790	1303
8/16/2018	1100	790	1228
8/7/2019	970	790	1145
8/24/2020	890	790	1054
8/11/2021	820	780	970
8/24/2022	780	705.9	938.8
8/30/2023	620	624.9	920
8/7/2024	920	546.9	903.6
8/5/2025	790	464.5	896.2



Sen's Slope and 95% Confidence Band Analysis Run 10/10/2025 11:34 AM

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 10/10/2025 11:35 AM

Ottumwa-Midland Landfill Client: SCS Engineers Data: OML_State

	MW-15R	LCL	UCL
8/24/2017	2990	1713	4269
8/16/2018	3010	1431	3858
8/7/2019	2600	1165	3448
8/25/2020	2400	865.5	3010
8/12/2021	2200	570	2600
8/24/2022	970	281.3	2394
8/30/2023	840	-36.39	2191
8/6/2024	440	-434.9	1998
8/5/2025	570	-860.6	1787

Appendix F

Additional Points Data History, 2020-Present

Appendix F
Additional Points Data History, 2020-Present*
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	GU-1 TEMP						GU-2						GU-EX		
	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025	2020	2021	2022
ARSENIC, UG/L	<0.88	<0.75	Too Little Water to Sample	DRY	<0.53	<0.53	DRY	DRY	DRY	DRY	DRY	DRY	<0.88	1.9 J	2.2
BARIUM, UG/L	45	41 B			38	34 B							30	25 B	64
BERYLLIUM, UG/L	<0.27	<0.27			<0.33	<0.33							<0.27	<0.27	<0.27
BORON, UG/L	520	370			270	300							1,000	1,000	870
CALCIUM, MG/L[1]	--	--			230	200							--	--	--
COBALT, UG/L	11	14			11	6.0							1.3	2.6	4.0
COPPER, UG/L	<1.5	<1.4			<1.8	<3.2							<1.5	<1.4	7.5
FLUORIDE, MG/L	<0.23	0.47 J			0.42 J	0.52 J							0.30 J	0.76	<0.22
IRON, UG/L	<50.0	41 J			<36	<50							720	810	6,900
LEAD, UG/L	<0.11	<0.21			<0.26	<0.33							<0.11	<0.21	1.1
LITHIUM, UG/L[1]	--	--			48	46							--	--	--
MAGNESIUM, UG/L	70,000	67,000			61,000	61,000							29,000	38,000	53,000
MANGANESE, UG/L	3,100	3,000			2,000	1,700							240	530	400
MOLYBDENUM, UG/L[1]	--	--			2.2	2.1							--	--	--
SELENIUM, UG/L	<1.0	<0.96			1.4 J	<1.4							<1.0	0.97 J	2.0 J
ZINC, UG/L	40	35			29	31							10.0 J	<10	36
CHLORIDE, MG/L	16	17			20	20							5.5	8.2	15
SULFATE, MG/L	500	460			390	410							390	440	700
TOTAL DISSOLVED SOLIDS, MG/L	1,200	1,100			1,100	1,100							750	880	1,200
TOTAL SUSPENDED SOLIDS, MG/L[1]	--	--			<1.4	<1.3							--	--	--
pH, SU	7.03	6.44			6.73	6.76							7.16	7.25	6.76
TEMPERATURE, DEGREES C	16	15.9			20.7	21.5							20.5	19.9	17.8
SPECIFIC CONDUCTANCE, UMHOS/CM	1,758	1,615			6.66	1,422							1,114	1,298	1,489
OXIDATION REDUCTION POTENTIAL, MV[1]	--	--			83.1	172							--	--	--
DISSOLVED OXYGEN, MG/L[1]	--	--			1,438	8.86							--	--	--

NOTES:
1. Parameter added to sampling list in 2023 as part of monitoring program modifications directed by IDNR.
2. Specific conductivity probe was likely not fully submerged in liquid at SW-3 in 2023.
* Historical data through 2019 are included in Appendix C

Updated: RM
Checked: LM

B = Compound was found in the blank and sample.
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

I:\25225073.00\Deliverables\2025 OML AWQR\Tables\[AWQR_OML_Tables_rev.xlsx]Appendix F_Add. Points History

Appendix F
Additional Points Data History, 2020-Present*
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	LP-1						SW-1R						SW-2R			
	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025	2020	2021	2022	
ARSENIC, UG/L								3.7						2.5		
BARIUM, UG/L								130 B						150 B		
BERYLLIUM, UG/L								<0.27						<0.27		
BORON, UG/L								71 J						150		
CALCIUM, MG/L[1]								--						--		
COBALT, UG/L								0.55						5.1		
COPPER, UG/L								<1.4						6.9		
FLUORIDE, MG/L								0.52						0.6		
IRON, UG/L								210						5600		
LEAD, UG/L								<0.21						3.2		
LITHIUM, UG/L[1]								--						--		
MAGNESIUM, UG/L								25,000						24,000		
MANGANESE, UG/L	DRY	DRY	DRY	DRY	DRY	DRY	DRY	600	DRY	DRY	DRY	DRY	DRY	690	DRY	
MOLYBDENUM, UG/L[1]								--						--		
SELENIUM, UG/L								<0.96						1.2 J		
ZINC, UG/L								<10						53		
CHLORIDE, MG/L								19						13		
SULFATE, MG/L								23						130		
TOTAL DISSOLVED SOLIDS, MG/L								340						390		
TOTAL SUSPENDED SOLIDS, MG/L[1]								--						--		
pH, SU								7.52						7.73		
TEMPERATURE, DEGREES C								23.4						23.3		
SPECIFIC CONDUCTANCE, UMHOS/CM								461						647		
OXIDATION REDUCTION POTENTIAL, MV[1]								--						--		
DISSOLVED OXYGEN, MG/L[1]								--						--		

Appendix F
Additional Points Data History, 2020-Present*
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	SW-3						SW-4						SW-5			
	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025	2020	2021	2022	
ARSENIC, UG/L	1.1 J	1.8 J	4.4	3.1	2	3.6	5.9						0.99 J	8.9		
BARIUM, UG/L	42	57 B	84.0	21	52	72 B	270.0						58	140 B		
BERYLLIUM, UG/L	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.27						<0.27	<0.27		
BORON, UG/L	740	590	860	960	560	700	130						1,100	1,300		
CALCIUM, MG/L[1]	--	--	--	140	61	68	--						--	--		
COBALT, UG/L	0.096 J	0.36 J	0.67	0.41 J	0.20 J	0.30 J	1.8						0.25 J	3.8		
COPPER, UG/L	<1.5	9.3	2.3 J	<1.8	<1.8	<3.2	<1.5						<1.5	1.7 J		
FLUORIDE, MG/L	0.24 J	0.43 J	<0.22	<0.38	<0.38	0.48 J	<0.23						0.44 J	0.7		
IRON, UG/L	<50.0	260	590	130	76 J	170	950						61.0 J	3,200		
LEAD, UG/L	<0.11	0.35 J	0.44 J	0.28 J	<0.26	<0.33	0.42 J						<0.11	0.77		
LITHIUM, UG/L[1]	--	--	--	11	8.7 J	8.1 J	--						--	--		
MAGNESIUM, UG/L	25,000	26,000	36,000	54,000	23,000	30,000	26,000						32,000	39,000		To
MANGANESE, UG/L	<4.0	50	25	45	26	28	4,700	DRY	DRY	DRY	DRY	DRY	300	7,500	DRY	W
MOLYBDENUM, UG/L[1]	--	--	--	25	9.9	11	--						--	--		Sa
SELENIUM, UG/L	<1.0	1.3 J	2.4 J	2.1 J	1.9 J	<1.4	<1.0						<1.0	1.0 J		
ZINC, UG/L	<10.0	44	<10	9.8 J	<9.7	<13	<10.0						<10.0	<10		
CHLORIDE, MG/L	3.5 J	5.3	5.7	16	4.6 J	12	20						7.4	13		
SULFATE, MG/L	310	270	470	830	250	340	36						430	450		
TOTAL DISSOLVED SOLIDS, MG/L	490	470	730	1,000	410	580	410						760	900		
TOTAL SUSPENDED SOLIDS, MG/L[1]	--	--	--	14	8.3	38	--						--	--		
pH, SU	8.93	7.41	8.68	9.01	8.56	7.8	7.55						7.45	7.14		
TEMPERATURE, DEGREES C	26.8	28.4	29.4	31.4	28.1	27.4	22.5						22.8	27.8		
SPECIFIC CONDUCTANCE, UMHOS/CM	786	741	963	--[2]	8.94	--[1]	721						1,196	1,416		
OXIDATION REDUCTION POTENTIAL, MV[1]	--	--	--	45.8	18.0	--[1]	--						--	--		
DISSOLVED OXYGEN, MG/L[1]	--	--	--	7.64	651	--[1]	--						--	--		

Appendix F
Additional Points Data History, 2020-Present*
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	LEACHATE BASIN						TCB-1/2					
	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025
ARSENIC, UG/L	3.2	30	9.4	4.9	9.7	13	1.4 J	1.1 J	1.0 J	1.3 J	0.95 J	0.90 J
BARIUM, UG/L	70	42 B	55.0	61	72	61 B	140.0	150 B	110	63	76	65 B
BERYLLIUM, UG/L	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33
BORON, UG/L	4300	2500	2,400	2,200	2,100	2,000	870	440	450	480	430	430
CALCIUM, MG/L[1]	--	--	--	200	260	200	--	--	--	140	130	110
COBALT, UG/L	0.26 J	0.47 J	0.31 J	0.30 J	0.68	0.32 J	<0.091	<0.091	<0.19	<0.17	<0.17	0.85
COPPER, UG/L	1.5 J	4.9 J	2.0 J	2.4 J	<1.8	<3.2	<1.5	<1.4	<1.8	<1.8	<1.8	<3.2
FLUORIDE, MG/L	<0.23	<0.28	<0.22	<0.38	<0.38	<0.38	<0.23	0.35 J	<0.22	<0.38	<0.38	<0.38
IRON, UG/L	<50.0	90 J	45 J	<36	<36	<50	<50.0	<36	<36	52 J	<36	340
LEAD, UG/L	<0.11	<0.21	<0.24	<0.24	<0.26	<0.33	<0.11	<0.21	<0.24	<0.24	<0.26	<0.33
LITHIUM, UG/L[1]	--	--	--	35	43	24	--	--	--	<2.5	3.3 J	<2.9
MAGNESIUM, UG/L	85,000	21,000	31,000	34,000	28,000	26000	10,000	7,500	12,000	15,000	14,000	15,000
MANGANESE, UG/L	62	33	15	16	86	25	4.7 J	6.4 J	<3.6	8.9 J	6.0 J	8.5 J
MOLYBDENUM, UG/L[1]	--	--	--	790	680	560	--	--	--	4.1	3.9	4.4
SELENIUM, UG/L	33	60	37	38	76	46	1.1 J	1.3 J	1.0 J	<1.4	<1.4	<1.4
ZINC, UG/L	<10.0	14 J	<10	6.9 J	<9.7	25	<10.0	<10	<10	<6.4	<9.7	<13
CHLORIDE, MG/L	150	290	230	410	1,000	450	11	12	<2.3	18	12	14
SULFATE, MG/L	4,300	1,600	2,200	2,500	1,900	2,000	370	270	370	560	380	370
TOTAL DISSOLVED SOLIDS, MG/L	7,500	2,900	3,500	3,300	5,000	3,200	590	420	570	730	590	590
TOTAL SUSPENDED SOLIDS, MG/L[1]	--	--	--	8.7	6	160	--	--	--	1.3 J	3.9	1.4 J
pH, SU	8.59	8.45	8.86	8.86	8.6	8.23	8.46	7.44	8.79	7.79	8.06	8.70
TEMPERATURE, DEGREES C	26.8	27	29.1	30.3	25.8	29.9	27.7	29.1	27.3	26.6	28.3	27.8
SPECIFIC CONDUCTANCE, UMHOS/CM	4,097	4,306	4,567	5,364	12.64	4,497	917	695	772	1,003	8.39	809
OXIDATION REDUCTION POTENTIAL, MV[1]	--	--	--	63.3	63.7	--[1]	--	--	--	67.0	71.9	118.4
DISSOLVED OXYGEN, MG/L[1]	--	--	--	10.4	6769	--[1]	--	--	--	7.47	863	9.26

Appendix G

2025 Annual Facility Inspection Summary and Leachate Control System Performance Evaluation

Annual Facility Inspection Summary – 2025
Interstate Power and Light Company
Ottumwa-Midland Commercial Landfill
Permit No. 90-SDP-8-92P

This annual facility inspection summary for the Interstate Power and Light Company (IPL) Ottumwa-Midland Landfill (OML) includes the following elements:

- Engineering inspection described in Section 8.0 of the August 2016 Operations Manual.
- Annual National Pollutant Discharge Elimination System Storm Water Pollution Prevention Plan (SWPPP) review.
- Annual Leachate Control System Performance Evaluation required by Special Provision 6.c. of the permit for OML (Sanitary Disposal Permit No. 90-SDP-8-92P).
- Groundwater monitoring well inspections.
- Iowa Department of Natural Resources (IDNR) inspections.

A summary of each annual inspection element is provided in the sections below.

No portion of the facility has received final cover, so no annual post-closure inspections have been completed per 567 IAC 103.1(5) f.

SUMMARY OF RESULTS AND RECOMMENDATIONS

SCS identified no deficiencies or releases during the annual inspection of the CCR unit at OML. Deficiencies and releases must be remedied by the owner or operator as soon as feasible, and the remedy documented.

SCS did identify conditions during the annual inspection that are not considered deficiencies but have the potential to become a deficiency if left unaddressed. Each condition and the recommendations provided by SCS to address them are summarized in the table below. These conditions, remedial recommendations, and activities completed or planned to remedy each item, as available from IPL, are described in further detail in this report.

Condition	Location/ Phase	Recommendation(s) / [STATUS]
Woody vegetation in leachate drainage layer sand	Expansion Phase 1 (northeast corner at toe of slope and contact water swale)	Spot removal of woody vegetation. **[COMPLETE]** Monitor during 7-day inspections.
Woody vegetation encroaching on liner limits	Expansion Phase 1 – north and south of liner limits	Remove woody vegetation. **[COMPLETE]** Monitor during 7-day inspections.

Condition	Location/ Phase	Recommendation(s) / [STATUS]
Small tree growing in stormwater swale	North of proposed Phase 2 area (east of inlet to culvert draining to Sedimentation Basin No. 2)	Remove tree. **[COMPLETE]** Monitor stormwater features for woody growth during 7-day inspections.
Minor exposed soil areas without vegetation within intermediate soil cover	Existing Landfill (intermediate cover, various locations)	Repair/restore areas as vegetation maintenance is completed or if CCR is exposed. **[COMPLETE]** Monitor during 7-day inspections.
Small area of erosion of leachate drainage sand	Expansion Phase 1 – west interior berm slope near contact water basin inlet pipes	Supplement leachate drainage sand to maintain minimum 1 foot of material above geomembrane. **[COMPLETE]** Monitor during 7-day inspections.
Exposed soil areas without vegetation	Slopes of Sedimentation Basin No. 2 (Various locations)	Repair/restore vegetation. Add topsoil, seed, and erosion mat. **[COMPLETE]** If vegetation establishment is difficult, add geotextile and riprap. Monitor during 7-day inspections.
Potential loss of contact water run-off control due to flow restriction and reduced freeboard	Expansion Phase 1 (northeast corner at toe of slope and contact water swale)	Remove woody vegetation and CCR/sediment buildup. **[COMPLETE]** Monitor during 7-day inspections.
Separated stitched rain cover ballast seams with vegetation	Expansion Phase 1 – rain cover ballast (various locations)	Repair stitching with zip ties or add supplemental sandbag ballast in lieu of stitching. **[COMPLETE]** Remove woody vegetation. **[COMPLETE]** Monitor during 7-day inspections.
Bare areas and small surface cracking	Expansion Phase 1 – west berm of temporary contact water basin	Add topsoil, seed, and erosion mat. **[PLAN TO SEED IN SPRING 2026]** Use geotextile/aggregate if vegetation does not establish. Fill cracks with soil/bentonite if needed. Monitor during 7-day inspections.

Condition	Location/ Phase	Recommendation(s) / [STATUS]
Level sensor in leachate head well LH-1 (transducer) is reading "-1.2" inches.	Expansion Phase 1 – Control Panel Readout	Evaluate sensor (i.e. place sensor in 5-gallon bucket and observe readout). Discuss sensor calibration with EPG Companies (EPG) [leachate level measurement system manufacturer]. https://www.epgco.com/aboutus/contact-us/ **[SCS ENGINEERS REACHED OUT TO EPG REGARDING READING. EPG TO ASSIST WITH RECALIBRATION.]** Monitor during 7-day inspections.
GU-1/GU-2 outlet manhole without cover	GU-1/GU-2 outlet manhole, west of Phase 1	Trim vegetation around the manhole. Install a manhole cover or grate. **[NO LONGER APPLICABLE DUE TO CONSTRUCTION WORK IN AREA. VEGETATION REMOVED AND INFRASTRUCTURE UPDATED]**

ENGINEERING INSPECTION

On August 11, 2025, Mr. Phillip Gearing, PE with SCS Engineers, conducted a site inspection. The inspection included a review of operating records kept for compliance with U.S. Environmental Protection Agency (U.S. EPA) Rule 40 CFR 257, Subpart D - Standards for the Disposal of Coal Combustion Residuals (CCR) in Landfill and Surface Impoundments, and a visual review of the landfill facility for signs of distress or malfunction. This inspection summary addresses the report items described in Section 8.0 of the Operations Manual.

Changes in Geometry

No apparent changes in geometry were noted that would indicate distress or malfunction of the CCR unit at the facility since the previous annual inspection at OML, completed under 40 CFR 257.84(b)(1). All changes in geometry observed during the annual inspection were the result of planned CCR filling.

CCR Volumes

Approximately 1,335,400 cubic yards (CY) of CCR was in place at OML as of August 11, 2025. This estimate is based on:

- The in-place volume as of March 11, 2025, as calculated using a topographic survey of the site and record surveys of liner construction.
- The volume of CCR material placed between March 11, 2025, and August 11, 2025, as estimated using actual disposal data provided by IPL and average daily disposal rates estimated using the data provided. Disposal records provided by IPL through June 2025 supported this estimate.

Appearance of Structural Weakness

The inspection included a review of the appearance of an actual or potential structural weakness of the CCR unit as indicated by the following:

Signs of Surface Movement or Instability

No signs of surface movement or instability were noted during the inspection.

Inappropriate Vegetation Growth

No inappropriate vegetation growth impacting the CCR unit was noted during the inspection. The following items have the potential to become a deficiency if left unaddressed:

- Woody vegetation was present in the leachate drainage layer sand at the toe of slope in the northeast corner of Expansion Phase 1 near the sump area and contact water swale. If left to grow, it could impede contact water flow or leachate flow within the sand leachate drainage layer. Removal of vegetation is recommended, and areas should be monitored during the 7-day inspections.

- Woody vegetation was encroaching on the liner limits along the north and south boundaries of Expansion Phase 1. If left to grow, it could damage the liner. Removal of vegetation is recommended, and areas should be monitored during the 7-day inspections.

- A small tree was observed to be growing in the stormwater swale north of proposed Phase 2 and just east of the inlet to the culvert draining to Sedimentation Basin No. 2. If left to grow, it could impede water flow. Removal of the tree is recommended, and the area should be monitored during the 7-day inspections.

- Vegetation was generally dense across the intermediate cover and perimeter features. Mowing is recommended to facilitate 7-day inspections.

Vegetation growth was discussed with plant staff. Mowing of intermediate and perimeter features was performed based on post-inspection observations by SCS personnel. Maintenance and removal of vegetation has occurred post the inspection based on conversations with IPL staff.

Animal Burrows

No animal burrows were noted during the inspection.

Erosion Damage

The following erosion damage or exposed soil conditions were noted during the inspection:

- Minor exposed soil areas without vegetation were present within the intermediate soil cover area of the existing landfill. If left unaddressed, CCR material could become exposed. It is recommended that vegetation be restored and areas monitored during the 7-day inspections for improved growth.

- Localized erosion of leachate drainage sand was observed at the toe of the west interior berm slope near the contact water basin inlet pipes in expansion Phase 1. If left unaddressed, the geomembrane material could be exposed and vulnerable to damage. It is recommended that the leachate drainage layer sand be supplemented to maintain at least 1 foot of material above the geomembrane. Monitor area during 7-day inspections.

- Exposed soil areas lacking vegetation were present in various locations along the slopes of Sedimentation Basin No. 2. This could impact stormwater run-on/run-off control features if vegetation is not restored. It is recommended to add topsoil, seed, and erosion mat to exposed areas to restore vegetation. If vegetation establishment is difficult, add geotextile and riprap. Monitor area for stabilization during the 7-day inspections.

The erosion or exposed soil conditions were discussed with plant staff. Maintenance of the erosion damage or exposed soil areas has occurred post the inspection based on conversations with IPL staff.

Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage was noted during the inspection.

Disruptive Conditions

Existing Disruptive Conditions

No existing conditions that were disrupting the operation and safety of the CCR unit were noted during the annual inspection.

Potentially Disruptive Conditions

The following potentially disruptive conditions were observed during the annual inspection:

- Woody vegetation, CCR, and sediment build-up in contact water management features at the northwest corner of Expansion Phase 1 toe slope, and the contact water swale is reducing the freeboard available for contact water run-off features. It is recommended that the woody vegetation and accumulated CCR/sediment be removed and the area monitored during the 7-day inspections.

  Based on correspondence with IPL, the accumulation of woody vegetation, CCR, and sediment has been addressed.

- Stitched rain cover ballast material seams have started to separate at various locations on the rain cover ballast in Expansion Phase 1, and some woody material was growing on the ballast material. This may subject the rain cover material to uplift and cause potential damage. Some seams have been repaired with zip ties. It is recommended that the separated stitching is repaired, or supplemental sandbag ballast is added in lieu of stitching, and that the rain cover ballast material be monitored during the 7-day inspections.

  Based on correspondence with IPL, the separated rain cover ballast material seams identified during the inspection have been repaired and the woody material has been removed.

- Bare areas and minor surface cracking was observed on the temporary contact water basin berm. Erosion was not observed in the bare areas. The minor cracking was due to desiccation of the soil from dry conditions. Add topsoil, seed, and erosion mat to exposed areas. If vegetation fails to establish, it is recommended that geotextile and aggregate be placed where vegetation is bare or across the entire berm. Monitor the area during the 7-day inspections.

  Based on correspondence with IPL, steps to revegetate bare areas of the temporary contact water basin berm will occur in the Spring of 2026. If cracking becomes pronounced, before bare soil is rectified, fill cracks with soil/bentonite mixture.

- The leachate headwell (LH-1) level sensor (transducer) was observed to be reading -1.2 inches. The level of leachate in the sump was adequate and there were no alarms observed at the control panel. It is recommended that the sensor be tested in a 5-gallon bucket for accuracy and that a conversation be had with EPG on the calibration of the transducer. Continue to monitor the leachate levels in both the sump and headwell during 7-day inspections.

  EPG was contacted and will assist with recalibration of the level sensor.

- The GU-1/GU-2 outlet manhole located west of Phase 1 was under construction and lacking a cover or grate, and dense vegetation surrounded the structure. There was no observed debris in the manhole at the time of inspection and the system appeared to be operating effectively. It is recommended that the vegetation be trimmed to prevent future debris from falling into the manhole, and that a manhole cover or grate be installed.

  Post inspection, construction work around the manhole had been performed and upgrades were occurring to the outlet; therefore the inspection items have been resolved.

The following potentially disruptive conditions were identified by site staff following the annual inspection. The existing landfill leachate collection and underdrain systems are operational; however, there are some infrastructure conditions that were observed and inspected by site staff after the annual inspection of the landfill. The items include the following:

- Damage to fiberglass wall of the existing landfill leachate lift station.

- Stormwater pond water is potentially infiltrating the underdrain pipe, causing a higher volume of water that is managed due to:
  - Leakage in an existing landfill groundwater underdrain transfer pipe.
  - Leaking stormwater pond isolation valve.

These items are not currently disrupting the operation and safety of the CCR unit. IPL is currently working to investigate and repair the items above.

Other Changes Since Previous Annual Inspection

No changes to site conditions that appear to have the potential to affect the stability or operation of the facility were noted during the inspection.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SWPPP

The SWPPP – Annual Site Compliance Evaluation/Report for 2025 is not yet available and will be completed by December 31, 2025. The prior SWPPP report, dated November 2024, is included in Attachment A for reference. Site personnel training records are included in Attachment B.

LEACHATE CONTROL SYSTEM PERFORMANCE

Leachate head levels are measured monthly by the landfill operator from LP-1 and LH-1. The records for leachate head levels are kept available at the site at all times. Monthly leachate elevation and head measurement records were mistakenly not recorded for LP-1 during the first half of 2025. The LH-1 measurements starting in August 2025 reflect an apparent level sensor (transducer) error. The sensor was observed to be reading -1.2 inches. The level of leachate in the sump was adequate and there were no alarms observed at the control panel. It is recommended that the sensor be tested in a 5-gallon bucket for accuracy and that a conversation be had with EPG Companies on the calibration of the transducer. Continue to monitor the leachate levels in both the sump and headwell during 7-day inspections.

Records of volume of leachate collected and the volume of leachate and contact water transported off site for treatment/disposal are kept available at the site at all times. Leachate and contact water removal and hauling records were viewed during the inspection. The Leachate Control System Performance Evaluation (LCSPE) is included as Attachment C.

Every 3 years leachate collection lines are to be cleaned and inspected. The collection lines were last cleaned in October 2023. The LCSPE includes information about the collection line cleaning.

GROUNDWATER WELLS

Michael Morgan of SCS Engineers conducted an inspection of the site monitoring wells on August 7, 2025. All wells were found to be in good condition.

IDNR INSPECTIONS

The most recent IDNR inspection of the facility was performed on June 1, 2021. The inspection report is included as Attachment D.

Attachment A

SWPPP – Annual Site Compliance Evaluation/Report and Signature Log

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

ANNUAL SITE COMPLIANCE EVALUATION / REPORT

for the

Ottumwa Midland Landfill

Inspection date: 11/20/2024

Prepared by

Rob Saunders

Guidance for Inspectors

During the inspection, use these guidelines:

- Employees should use common sense and maintain a neat, clean working environment which will help prevent spilling of significant materials. Any spills should be promptly cleaned up.
- All portable containers are required to be clearly labeled as to the contents.
- Is there evidence of pollutants entering the storm drainage system?
- Are the BMPs that are implemented effective in preventing storm water pollution?
- Is the Storm Water Pollution Prevention Plan up to date?
- Storm water pollution prevention equipment including dikes, curbs, gutter, drains, valves, concrete, containers, and drums should be given necessary preventative maintenance to prevent releases to storm water.
- All storm water pollution equipment will be maintained in a good operating order.
- Other equipment (such as tanks, containers, and drums) will be checked regularly for signs of deterioration.

For Section 313 Water Priority Chemicals, the periodic storm water inspections will include observations for the following:

- Leaks or conditions that would lead to discharges of section 313 Water Priority Chemicals.
- Conditions that could lead to direct contact of storm water with raw materials, intermediate materials, or products.
- Piping, pumps, storage tank and bins, pressure vessels, process and material handling equipment, and material bulk storage areas for leaks, wind blowing, corrosion, support or foundation failure, or other deterioration or non-containment.

Construction activities may involve the removal of large areas of vegetative cover exposing raw soil to erosion. During these construction periods, procedures should be implemented to reduce erosion. These procedures may include the following:

- Compliance with any applicable Storm Water Pollution Plan for Construction Activities.
- Seeding erodeable areas with a suitable grass.
- Spreading crushed rock on erodable areas.
- Minimizing the time period raw soil is exposed.
- Building temporary silt retention dams in ditches to allow settling of suspended soil before discharge.
- Applying biodegradable soil cover such as straw or burlap to highly erodable areas until a more permanent solution can be implemented.
- Use of silt fences.
- Use of velocity reduction structures (rip rap).

ANNUAL SITE COMPLIANCE EVALUATION / REPORT

In accordance with published EPA guidelines and requirements for Storm Water Discharges Associated with Industrial Activities, this ANNUAL SITE COMPLIANCE EVALUATION / REPORT is provided for record and authorization.

Facility Name:	Ottumwa Midland Landfill
Facility Address:	15300 130th Street Ottumwa, Iowa 52501
Date:	11/20/2024
Inspector(s)	Rob Saunders

REQUIRED OBSERVATIONS and ACTIVITIES:

Do you see: (Y or N)		
	No	Pollutants entering stormwater drainage area, if "YES" then describe on an attached sheet?
	Yes	BMP measures effectively reducing pollutant loading, if "NO" then describe on an attached sheet?
	No	Areas needing new or additional BMP measures, if "YES" then describe on attached sheet?
	Yes	BMP measures operating properly, if "NO" then describe on an attached sheet?
	Yes	Effective and proper use of any equipment in use for this plan's implementation, if "NO" then describe on an attached sheet?
	Yes	Any areas of noncompliance, if "YES" then describe on an attached sheet?

Note:

(✓) Prepare an ANNUAL SITE COMPLIANCE EVALUATION/REPORT, include the following:
- A) Inspection date,
- B) Inspection personnel,
- C) Incidents of noncompliance,
- D) Inspection results,
- E) Follow-up activities (schedule), and
- F) Certification

(✓) Was the current SWPPP reviewed and is it up to date?[1]

(✓) Sign the report in accordance with Section 2.6.2 and keep with plan.

(EPA Guidance Manual)

[1] Update the SWPPP. Be sure to update the revision date on the title page and in the footer on each page. Be sure to update the revision sheet to reflect the review, even if no changes were made. Send an updated copy to the site See OGS Environmental Procedure 088: "How to Update SWPPP Plans."

ANNUAL SITE COMPLIANCE EVALUATION / REPORT

INCIDENTS of NON-COMPLIANCE:

- Junk tire in Storm Water Outfall 005 discharge area.
- Three of the neighbor's cows jumped the fence and were on OML property.

INSPECTION RESULTS:

- See the attached document, "Annual Facility Site Compliance Inspection (AFSCI) Finding Tracking Log."

FOLLOW-UP ACTIVITIES (SCHEDULE):

- Follow up on all incidents of non-compliance in one month (12/20/2024).

ADDITIONAL INFORMATION

- None

It is therefore the position of this team, that the **Ottumwa Midland Landfill** Storm Water Pollution Prevention Plan (SWPPP) is in compliance and will effectively reduce (or eliminate) storm water pollution at its source.

CERTIFICATION	
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware of the significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
A. Name & Official Title (type or print): Derek Roberts Manager GENCO Operations Ottumwa Generating Station	B. Area Code and Telephone No: (641) 935-2908
C. Signature:	D. Date Signed: 11/21/24

Attachment B

Site Personnel Training Records

Alliant Energy Ottumwa Generating Station	OGS Safety Procedure 323: Training Sign In Sheet	Revision Date: 6/5/2024 Author: Rob Saunders

Training Date:	02/28/25

Row No.	Trainer Name	Course Name:	Course Code:
1	Rob Saunders	OGS Annual CCR Rule Training for Inspectors	
2			
3			
4			

Row No.	Employee Name	Employee Number	Employee Signature
1	Aaron Thamke (17163)	17163	
2	Adam Phillips (17558)	17558	
3	Al White (09792)[C]	09792	
4	Blake McClaflin (15299)	15299	
5	Brandon Hartley (19504)	19504	
6	Brandon Saner (16819)	16819	
7	Brian Crall (17165)	17165	
8	Brian Johnson (19737)	19737	
9	Chad Black (17016)	17016	
10	Clinton Thompson (16207)	16207	
11	Cole Campbell (19712)	19712	
12	Conner Glosser (21413)	21413	
13	Dalton Burnstedt (22020)	22020	
14	Dan Griffith (17610)	17610	
15	Daniel Thrasher (09804)	09804	
16	Danny Lamb (15512)	15512	
17	Dave Bettis (16685)	16685	
18	David Jasper (05030)	05030	
19	Derek Roberts (09346)	09346	Derek Roberts
20	Dexter Barclay (13268)	13268	
21	Douglas Sloan (04409)	04409	
22	Douglas Sparks (05425)	05425	

23	Eddie Mitchell (03250)	03250	
24	Frederick Latham (17010)	17010	
25	Greg Wynn (17443)	17443	
26	Hunter Gerths (24020)	24020	
27	James Rose (13818)	13818	
28	Jason Marth (16760)	16760	
29	Jeff Major (23895)	23895	
30	Jeffery Annee (13533)	13533	
31	Jeffrey Deahl (07172)	07172	
32	Jeremy Kohlhaas (07562)	07562	
33	Jessica Ewing (19796)	19796	Jessica Ewing
34	Jevin Jensen (23728)	23728	
35	John Gerths (16835)	16835	
36	John McAninch (17563)	17563	
37	John Sheston (17410)	17410	
38	Jon Bickford (09794)	09794	
39	Jon Morlan (18358)	18358	
40	Keith Young (14740)	14740	
41	Kirk McAninch (16829)	16829	
42	Leon Wickenkamp (08594)	08594	
43	Mark Houg (16388)	16388	
44	Mark Lunsford (09822)	09822	
45	Michael Paxton (17059)	17059	
46	Nathan Miller (14197)	14197	
47	Nathan Moorman (23556)	23556	
48	Randall Raskie (21439)	21439	
49	Rebecca Jaques (03385)	03385	
50	Rob Saunders (16073)	16073	
51	Robert Taylor (09830)	09830	
52	Roger Lovelady (21994)	21994	
53	Roy Hicks (16729)	16729	
54	Ryan Black (17011)	17011	
55	Ryan Giltner (23555)	23555	
56	Scott Johnson (09802)	09802	

57	Stephen Keck (03370)	03370	
58	Taylor Crall (19715)	19715	
59	Terence Helton (17584)	17584	
60	Teri Burch (16818)	16818	Teri Burch
61	Terry Harris (09835)	09835	
62	Tom Barr (18891)	18891	
63	Tyler Smith (15603)	15603	
64	W. Alan Campbell (11159)	11159	
65	Wade Hart (16789)	16789	
66			
67			
68			
69			
70			

Note to the E&S Specialist: If a training was presented that has a THRIVE Course Code, then:
Submit a copy of this document to The Point--> Submit a Service Ticket --> IPL Ops Support Coordinator --> Category = IPL Training, Subcategory = Training Attendance Sheet. Be sure to add this document as an attachment to the Service Ticket.
☐ Submitted to the IPL Operations Support Services on _____.

Activity Code	Activity Name	Employee Name	Max of Activity Ended On
ENV0002	**ENV0002 SWPPP Annual Training**	Giltner, Ryan	4/10/2025
		Hart, Wade	2/19/2025
		McAninch, Kirk A	2/20/2025
ENV0007-GEN	**ENV0007 SPCC Training (Generation)**	Giltner, Ryan	6/3/2024
		Hart, Wade	2/19/2025
		McAninch, Kirk A	2/18/2025
ENV0012	**ENV0012 Fugitive Dust**	Giltner, Ryan	12/18/2024
		Hart, Wade	1/20/2025
		McAninch, Kirk A	2/18/2025
OGS0002	**OGS0002 OGS and OML SWPPP Training**	Giltner, Ryan	9/30/2025
		Hart, Wade	1/20/2025
		McAninch, Kirk A	2/18/2025
OGS0007	**OGS0007 OGS and OML Site Specific SPCC Training**	Giltner, Ryan	3/14/2024
		Hart, Wade	1/20/2025
		McAninch, Kirk A	2/18/2025
OGS0012	**OGS0012 OGS Fugitive Dust Training**	Giltner, Ryan	6/10/2024
		Hart, Wade	1/20/2025
		McAninch, Kirk A	2/18/2025
OGS0020	**OGS0020 OGS and OML RCRA Training**	Giltner, Ryan	6/10/2024
		Hart, Wade	1/20/2025
		McAninch, Kirk A	2/18/2025

Attachment C

Leachate Control System Performance Evaluation

November 25, 2025
File No. 25225073.00

Mr. Jeffrey Maxted
Alliant Energy
4902 N. Biltmore Lane
Madison, WI 53718

Subject: Leachate Control System Performance Evaluation
Interstate Power and Light Company
Ottumwa-Midland Commercial Landfill
Permit #90-SDP-08-92P

Dear Mr. Maxted:

This Leachate Control System Performance Evaluation (LCSPE) Report is provided by SCS Engineers (SCS) as per the requirements of the July 21, 2017, permit renewal for the Ottumwa-Midland Commercial Landfill (OML). This report is a supplement to the 2025 Annual Water Quality Report.

BACKGROUND

OML accepts coal combustion residuals (CCR). The current Phase 1 landfill is approximately 10 acres in size. The initial landfill permit was approved on September 23, 1994, by the Iowa Department of Natural Resources (IDNR). Landfill activities began in 1995. The last permit renewal was approved by the IDNR on July 21, 2017.

ORIGINAL LANDFILL LEACHATE CONTROL SYSTEM

The leachate control system in the original landfill area at OML consists of a leachate collection system, a leachate lift station, and a leachate storage lagoon. Construction of the leachate control system is described in the July 1995 Construction Certification Report that was prepared by Montgomery Watson. The leachate collection system layout is shown on **Figure 1**. A summary of the original landfill leachate control system is provided below.

The active leachate collection system in the original landfill consists of the following components:

- Twelve-inch protective general fill layer
- Geocomposite drainage layer
- Leachate collection pipes/trenches and cleanouts

Leachate collection pipe consists of 6-inch-diameter, perforated, heavy duty, smooth interior, corrugated polyethylene pipe (CPEP). Leachate collection system piping is installed in trenches excavated 18 inches into the 4-foot-thick compacted clay liner. One north-south-oriented trench and five east-west-oriented leachate collection trenches are installed at the base of the landfill. Leachate collection piping is bedded and covered with 1.5-inch clean stone, and the trenches are wrapped with geotextile. The geotextile-wrapped, stone-filled leachate collection trenches extend beneath the

geocomposite drainage layer and 12-inch protective general fill layer. The east-west leachate collection pipes are sloped to the interior north-south-oriented leachate collection pipe. The north-south leachate collection pipe then drains south to a leachate transport pipe.

Each end of the east-west-oriented leachate collection pipes are connected to a 6-inch-diameter, non-perforated, heavy duty, smooth interior, CPEP leachate cleanout pipe. The north end of the north-south-oriented leachate collection pipe is also connected to a CPEP cleanout pipe. The cleanout pipes extend up the liner side slopes and are exposed above grade at the limits of the landfill liner to provide cleanout access at the ground surface.

The north-south-oriented leachate collection pipe is connected to a 6-inch-diameter, non-perforated, Standard Dimension Ratio (SDR) 17 high-density polyethylene (HDPE) leachate transport pipe where it exits the lined limits of the original landfill to the south. The leachate transport pipe drains leachate by gravity to the leachate wet well/lift station located south of the sediment pond. From the lift station, leachate is pumped under 130th Street to the leachate lagoon via a 2-inch-diameter, non-perforated, SDR 17 HDPE force main.

Leachate is pumped from the lagoon for on-site reuse for moisture conditioning during CCR placement in the landfill or dust control within the lined limits of OML. Leachate is also transported off-site for treatment or disposal.

PHASE 1 EXPANSION LEACHATE CONTROL SYSTEM

The leachate control system in the Phase 1 Expansion area at OML consists of a leachate collection system, a leachate riser pipe and pump, and a leachate vault. Construction of the leachate control system is described in the November 5, 2015, Phase 1 Liner Construction Documentation Report, that was prepared by SCS. The leachate collection system layout is shown on **Figure 2**. A summary of the leachate control system in Phase 1 is provided below.

The active leachate collection system in Phase 1 consists of the following components:

- Twelve-inch leachate drainage layer
- Twelve-inch drainage filter and 12-inch coarse aggregate bedding over leachate collection pipes
- Leachate collection pipes/trenches and cleanouts

Leachate collection pipe consists of 6-inch-diameter, perforated, SDR 11, HDPE pipe. Leachate collection system piping is installed in a trench that is a minimum of 18 inches deep. The full 2-foot thickness of the clay liner was maintained under the trench during construction. One east-west-oriented leachate collection trench is installed at the base of the landfill cell, and gravity drains to the west. A sweep bend is located at the west end of the leachate collection piping, and the pipe is oriented to the southwest toward the leachate sump.

The east end and southwest ends of the leachate collection pipe are connected to a 6-inch-diameter, non-perforated, HDPE cleanout pipe. The cleanout pipes extend up the liner side slopes and are exposed above grade to provide cleanout access at the ground surface.

An 18-inch-diameter SDR 17 HDPE leachate collection sump riser pipe is installed in the leachate collection sump. The riser pipe extends up the liner side slope in the southwest corner of Phase 1 to the leachate vault. A pump is installed in the riser pipe and pumps leachate from the leachate sump to the leachate vault. From the leachate vault, leachate is pumped through a 3-inch HDPE force main to the leachate lift station. From the leachate lift station, leachate is pumped across 130th Street to the leachate lagoon via a 2-inch-diameter, non-perforated, SDR 17 HDPE force main.

Leachate is pumped from the lagoon for on-site reuse for moisture conditioning during CCR placement in the landfill or dust control within the lined limits of OML. Leachate is also transported off-site for treatment or disposal.

LEACHATE CONTROL SYSTEM PERFORMANCE EVALUATION

The July 21, 2017, permit renewal requires an annual evaluation of the effectiveness of the leachate control system. The evaluation is based on a review of the following items provided by Interstate Power and Light (IPL):

- Volume of Leachate Collected
- Leachate Head Well Measurements
- Leachate Collection Line Cleaning/Jetting

The following subsections provide a summary of each of these items.

Volume of Leachate Collected

The daily leachate volumes pumped from the landfill into the lagoon and transported off-site are shown in **Attachment A**. A total of 2,669,087 gallons of leachate were transported off-site to the City of Ottumwa during November 2024 through October 2025, according to IPL records. Remaining leachate was used for waste conditioning and dust control within the active disposal areas or remains stored in the leachate lagoon. Historical data that summarizes quantities of leachate transported off-site are provided in Table A-2 of **Attachment A**.

Leachate Head Well Measurements

The location of leachate head wells LP-1 and LH-1 are shown on **Figures 1** and **2**. LP-1 was installed on June 7, 2011, and is constructed of 2-inch-diameter Schedule 40 PVC with a 1-foot-long Schedule 40 PVC well screen. LP-1 was installed directly above the geocomposite.

LH-1 was constructed in 2015 during the Phase 1 construction project. LH-1 is constructed of a 3-inch-diameter, Schedule 80 PVC pipe with a 5-foot screened section at the end with 0.010-inch slots (10-slot). The headwell was installed at a constant elevation of approximately 753.55 feet directly on the geomembrane. The PVC pipe section is connected to a 3-inch-diameter solid SDR 17 HDPE riser pipe with an HDPE-to-PVC transition fitting prior to the 22½ degree HDPE elbow. A submersible level sensor was installed within the flat portion of the headwell just beyond the 22½ degree HDPE elbow.

A sensor malfunction hindered leachate head measurements at LH-1 in the second half of 2025. A previous sensor malfunction occurred at LH-1 in 2023. Troubleshooting and repair work to resolve

the previous malfunction were completed in February 2024. The cause of the current malfunction at LH-1 is being evaluated.

A summary table of 2024 and 2025 leachate head level measurements for LP-1 and LH-1 is included in **Attachment B**. Leachate head measurements at LP-1 were under 1 foot during each month of the reporting period for which a measurement was recorded, with the exception of November 2024 and July 2025. Leachate head measurements at LP-1 were mistakenly not recorded in January through June 2025. Leachate head measurements at LH-1 were under 1 foot during each month of the reporting period, prior to the current sensor malfunction.

Leachate Collection Line Cleaning/Jetting

The last jetting of the leachate collection lines was performed on October 11, 2023. The jetting documentation is included in **Attachment C**. The next leachate line jetting is scheduled to be performed in 2026.

Summary of Leachate Control System Performance Evaluation

Based on a review of the leachate data included in this submittal, the leachate control system at OML appears to be functioning as designed. The leachate is pumped from the leachate collection system to the leachate storage lagoon. Leachate from the lagoon is primarily used for dust control within the landfill. A total of 2,669,087 gallons of leachate were transported off-site during November 2024 through October 2025. The leachate collection lines were cleaned on October 11, 2023. The leachate control measures appear to be adequate.

Two recommendations related to the leachate collection system were made after an August 2025 site inspection:

- Evaluate the LH-1 sensor and discuss calibration with EPG Companies (EPG).
  - SCS has reached out to EPG regarding the reading
  - EPG is to assist with calibration
- Repair the rain cover ballast material stitching or add supplemental sandbag ballast in lieu of stitching
  - Repairs on the rain cover ballast have been completed.

If you have any questions about this report, please contact Tom Karwoski at 608-216-7369.

Sincerely,

Thomas J. Karwoski
Project Manager
SCS Engineers

Meghan Blodgett
Senior Hydrogeologist
SCS Engineers

MDB/lmh/TK

Encl. Figure 1 – Leachate Control System
Figure 2 – Expansion Phase 1 Leachate Lines
Attachment A – Leachate Volumes
Attachment B – Leachate Head Measurements
Attachment C – Leachate Line Jetting Documentation

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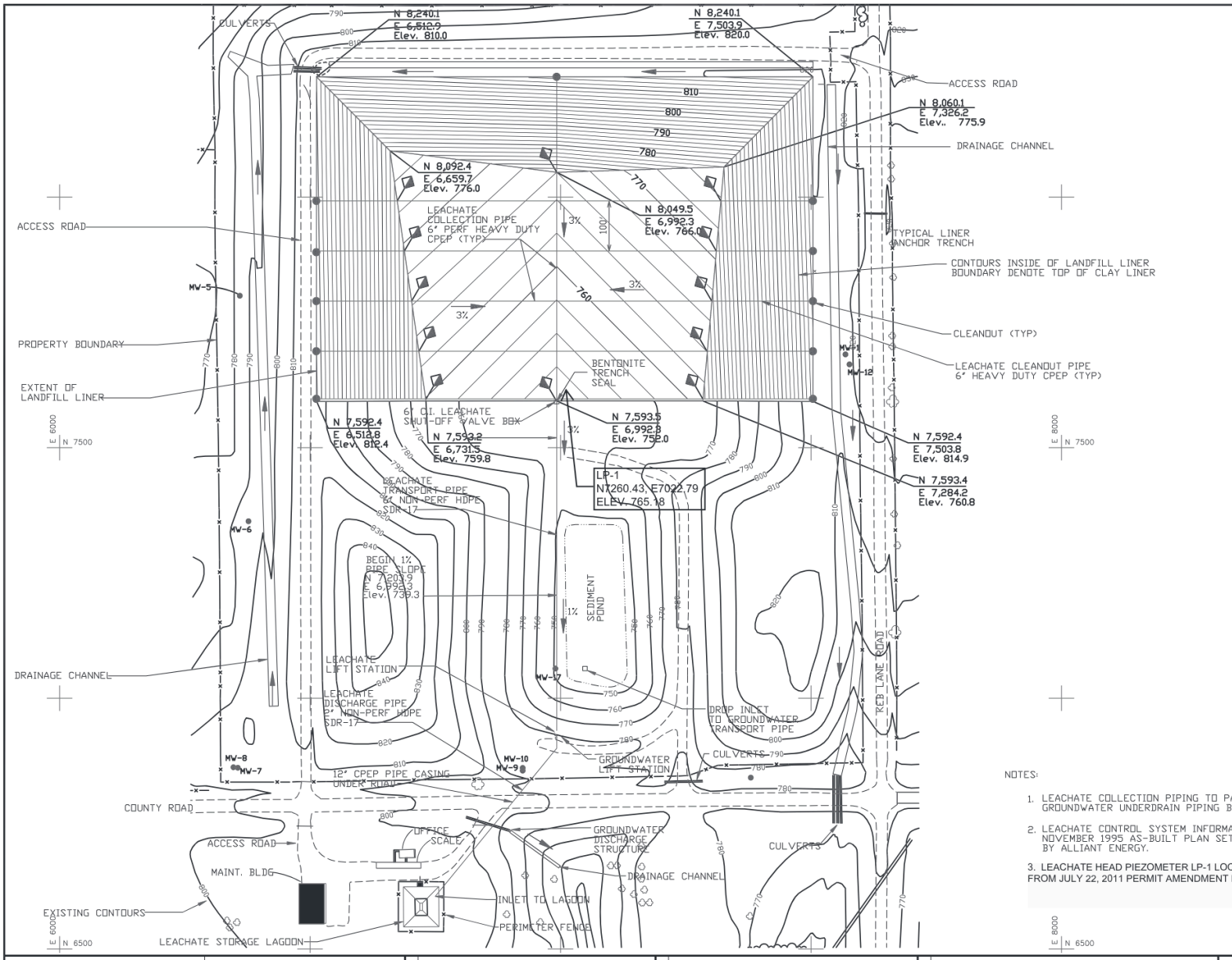
Figures



NOTES:

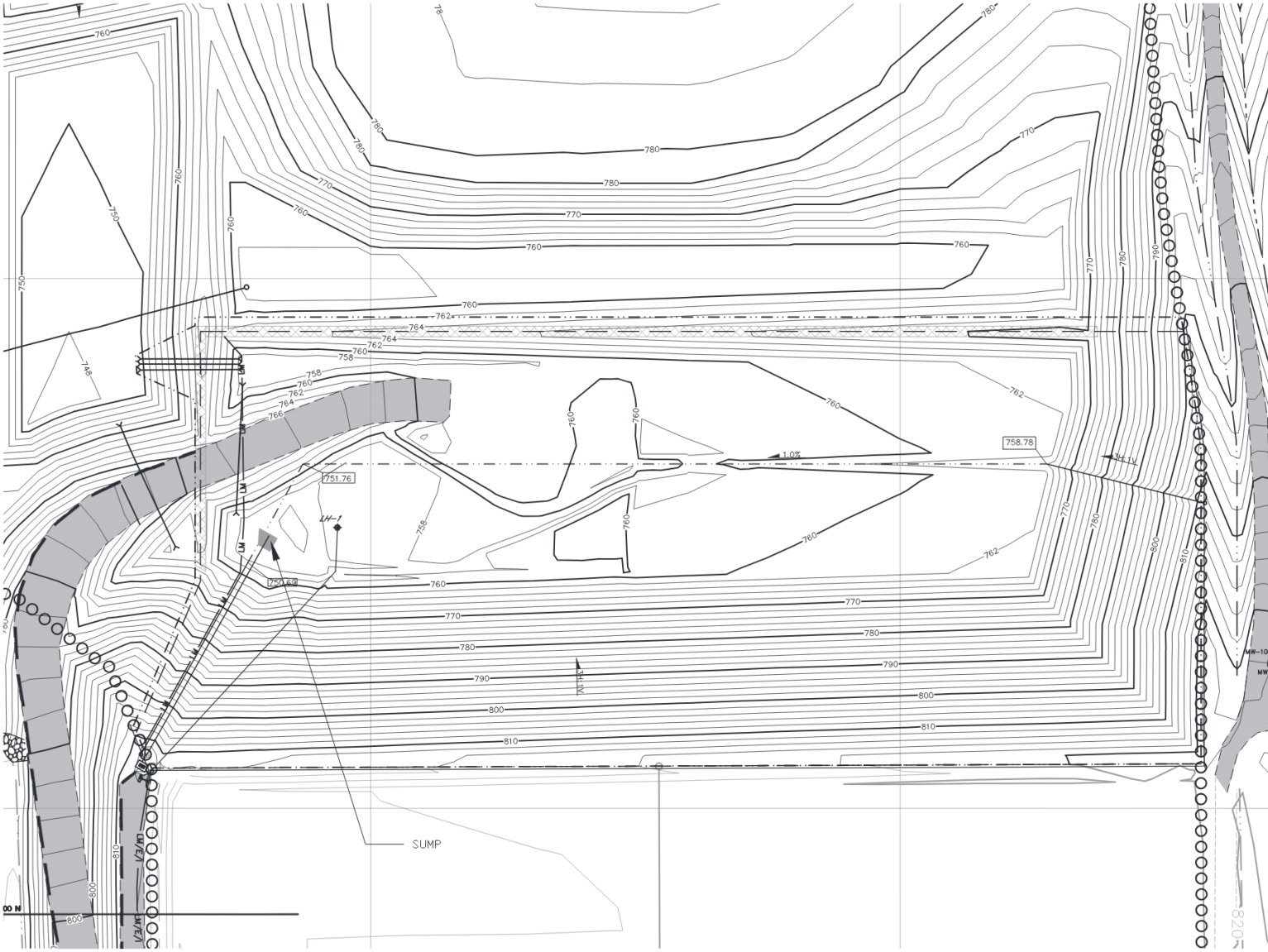
1. LEACHATE COLLECTION PIPING TO P
GROUNDWATER UNDERDRAIN PIPING B

2. LEACHATE CONTROL SYSTEM INFORMA
NOVEMBER 1995 AS-BUILT PLAN SET
BY ALLIANT ENERGY.

3. LEACHATE HEAD PIEZOMETER LP-1 LOC
FROM JULY 22, 2011 PERMIT AMENDMENT

PROJECT NO.	25213068.00	DRAWN BY:	KP	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501
DRAWN:	11/19/13	CHECKED BY:	TK			SITE	OTTUMWA MIDLAND LANDFILL OTTUMWA, IOWA
REVISED:	11/28/2023	APPROVED BY:	MDB				

I:\25213068\Drawings-General\Leachate system.DWG, 11/19/2013 9:51:21 AM



PROJECT NO.	25216073.00	DRAWN BY:	BJM	ENGINEER	**SCS ENGINEERS** 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501
DRAWN:	11/10/16	CHECKED BY:	MDB			SITE	OTTUMWA MIDLAND LANDFILL OTTUMWA, IOWA
REVISED:	11/10/16	APPROVED BY:	TK 11/23/2021				

Attachment A

Leachate Volumes

Leachate Removal and Hauling Records
Ottumwa-Midland Commercial Landfill

enter blue data
spreadsheet calculates red data

Instructions for Use

1. Enter the dates for the month in the date column.
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5. The spreadsheet will calculate the daily leachate generated and the cumulative volume of leachate hauled for the month.

Revision Date: 08/29/16

Nov-24	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	NA	5,421,478	NA	32,370,494	NA	NA	NA		
11/1/2024									
11/2/2024									
11/3/2024									
11/4/2024	43,250	5,464,728	40,260	32,410,754		22,710	City	N	PH 7.72 0712 KM
11/5/2024	19,964	5,484,692	18,600	32,429,354		22,753	City	N	PH 8.18 0650 KM
11/6/2024	17,816	5,502,502	13,834	32,443,188		22,767	City	N	PH 8.74 0757 KM
11/7/2024	23,015	5,525,517	22,205	32,465,393		22,775	City	N	PH 7.76 0656 SK
11/8/2024									
11/9/2024									
11/10/2024									
11/11/2024	22,160	5,547,677	20,330	32,485,723		22,748	City	N	PH 8.15 0630 WH
11/12/2024	23,370	5,571,047	19,390	32,505,113		22,748	City	N	PH 7.95 0640 SK
11/13/2024	18,591	5,589,638	20,962	32,526,075		22,772	City	N	PH 8.09 0735 WH
11/14/2024	15,407	5,605,045	14,806	32,540,881		22,851	City	N	PH 7.73 0618 WH
11/15/2024									
11/16/2024									
11/17/2024									
11/18/2024	30,750	5,635,795	28,744	32,569,625		22,801	City	N	PH 8.0 0700 WH
11/19/2024	14,100	5,649,895	12,100	32,581,725		22,832	City	N	PH 8.02 1055 SK
11/20/2024	40,310	5,690,205	23,838	32,605,563		22,782	City	N	PH 7.98 0658 SK
11/21/2024	8,506	5,698,711	5,370	32,610,933		17,151	City	N	PH 8.07 11:28 KM
11/22/2024									
11/23/2024									
11/24/2024									
11/25/2024	42,547	5,741,258	36,900	32,647,833		17,089	City	N	PH 7.99 0703 SK
11/26/2024	7,613	5,748,871	6,896	32,654,729		22,729	City	N	PH 7.86 0850 SK
11/27/2024	5,558	5,754,428	4,841	32,659,570		17,106	City	N	PH 7.83 0905 SK
11/28/2024									
11/29/2024									
11/30/2024									
Totals	332,957	NA	**289,076**	NA	**0**	324,614	NA		NA

[1] "Ground Water" refers to combination of old cell under-drain water plus storm water discharged form the old storm water pond. Both are discharged to the same wetwell. So, when storm water is discharged, there is no way to estimate the volume of under-drain water discharged, as the two streams are commingled in the wetwell. Storm water is not often discharged. This means that most of the time, but not all of the time, we are able to estimate the volume of under-drain water discharged. Ground water withdrawls that exceed 25,000 gpd would require a DNR water use permit.

Leachate Removal and Hauling Records
Ottumwa-Midland Commercial Landfill

enter blue data
spreadsheet calculates red data

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Revision Date: 08/29/16

Dec-24	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	NA	5,754,428	NA	32,659,570	NA	NA	NA		
12/1/2024									
12/2/2024	31,599	5,786,027	28,104	32,687,674				N	
12/3/2024	579	5,786,606	0	32,687,674				N	
12/4/2024	0	5,786,606	0	32,687,674				N	
12/5/2024	9,218	5,795,824	8,570	32,696,244				N	
12/6/2024									
12/7/2024									
12/8/2024									
12/9/2024	0	5,795,824	0	32,696,244				N	
12/10/2024	0	5,795,824	0	32,696,244				N	
12/11/2024	0	5,795,824	0	32,696,244				N	
12/12/2024	0	5,795,824	0	32,696,244				N	
12/13/2024									
12/14/2024									
12/15/2024									
12/16/2024	960	5,796,784	2	32,696,246		22,835	City	N	PH 8.0 WH 1025
12/17/2024	10,012	5,806,796	0	32,696,246		22,782	City	N	PH 7.78 SK 1045
12/18/2024	14,490	5,821,286	13,346	32,709,592		22,861	City	N	PH 7.87 SK 1000
12/19/2024	28,555	5,849,841	26,891	32,736,483		22,856	City	N	PH 7.93 WH 8:12
12/20/2024									
12/21/2024									
12/22/2024									
12/23/2024	39,160	5,889,001	33,607	32,770,090		22,784	City	N	PH 8.07 SK 0720
12/24/2024									
12/25/2024									
12/26/2024	20,500	5,909,501	19,915	32,790,005		22,803	City	N	PH 8.01 SK 0718
12/27/2024	24,070	5,933,571	23,027	32,813,032		22,827	City	N	PH 7.93 SK 0656
12/28/2024									
12/29/2024									
12/30/2024	21,450	5,955,021	16,056	32,829,088		22,813	City	N	PH 7.88 SK 0655
12/31/2024	21,440	5,976,461	12,106	32,841,194		17,137	City	N	PH 7.79 WH 0702
Totals	222,033	NA	**181,624**	NA	**0**	199,698	NA		NA

[1] "Ground Water" refers to combination of old cell under-drain water plus storm water discharged form the old storm water pond. Both are discharged to the same wetwell. So, when storm water is discharged, there is no way to estimate the volume of under-drain water discharged, as the two streams are commingled in the wetwell. Storm water is not often discharged. This means that most of the time, but not all of the time, we are able to estimate the volume of under-drain water discharged. Ground water withdrawls that exceed 25,000 gpd would require a DNR water use permit.

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Revision Date: 08/29/16

January	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	NA	5,976,461	NA	32,841,194	NA	NA	NA		
1/1/2025									
1/2/2025	16,430	5,992,891	9,753	32,850,947		22,808	City	N	PH 7.93 SK 0720
1/3/2025	27,300	6,020,191	24,735	32,875,682		34,122	City	N	PH 7.92 SK 0725
1/4/2025									
1/5/2025									
1/6/2025	27,374	6,047,565	24,342	32,900,024				N	
1/7/2025	0	6,047,565	0	32,900,024				N	
1/8/2025	11,190	6,058,755	7,520	32,907,544		34,086	City	N	PH 8.05 SK 0742
1/9/2025	28,810	6,087,565	29,120	32,936,664		33,990	City	N	PH 8.05 SK 0745
1/10/2025									
1/11/2025									
1/12/2025									
1/13/2025	36,230	6,123,795	32,960	32,969,624		34,058	City	N	PH 8.09 SK 0740
1/14/2025	34,280	6,158,075	32,333	33,001,957		34,034	City	N	PH 8.05 WH 0736
1/15/2025	11,188	6,169,263	9,996	33,011,953					
1/16/2025	6,149	6,175,412	4,958	33,016,911					
1/17/2025									
1/18/2025									
1/19/2025									
1/20/2025	21,229	6,196,641	18,418	33,035,329				N	
1/21/2025	0	6,196,641	0	33,035,329				N	
1/22/2025	0	6,196,641	0	33,035,329				N	
1/23/2025	0	6,196,641	0	33,036,329				N	
1/24/2025									
1/25/2025									
1/26/2025									
1/27/2025	0	6,196,641	0	33,036,329				N	
1/28/2025	15,300	6,211,941	12,284	33,048,613		34,072	City	N	PH 8.22 0715 SK
1/29/2025	35,457	6,247,398	34,388	33,083,001		34,199	City	N	PH 8.15 0630 SK
1/30/2025	6,058	6,253,456	4,788	33,087,789		34,046	City	N	PH 8.08 0715 SK
1/31/2025									
Totals	276,995	NA	245,595	NA	0	295,415	NA		NA

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Ottumwa-Midland Commercial Landfill

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Revision Date: 08/29/16

Febuary 2025	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	NA	6,253,456	NA	33,087,789	NA	NA	NA		
2/1/2025									
2/2/2025									
2/3/2025	57,674	6,311,130	38,450	33,126,239		22,667	City	N	PH 8.06 0635 SK
2/4/2025	3,580	6,314,710	1,455	33,127,694		22,547	City	N	PH 8.06 0635 WH
2/5/2025	9,356	6,324,066	6,503	33,134,197		22,710	City	N	PH 8.12 0645 SK
2/6/2025	3,992	6,328,058	2,666	33,136,863		22,329	City	N	PH 8.13 0642 KM
2/7/2025									
2/8/2025									
2/9/2025									
2/10/2025	26,333	6,354,391	18,102	33,154,965		11,317	City	N	PH 8.17 12:41 KM
2/11/2025	6,489	6,360,880	4,615	33,159,580				N	
2/12/2025	5,921	6,366,801	4,703	33,164,283				N	
2/13/2025	6,129	6,372,930	2,636	33,166,919				N	
2/14/2025									
2/15/2025									
2/16/2025									
2/17/2025	23,239	6,396,169	20,142	33,187,061				N	
2/18/2025	980	6,397,149	0	33,187,061				N	
2/19/2025	5,807	6,402,956	4,591	33,191,652				N	
2/20/2025	4,973	6,407,929	4,113	33,195,765				N	
2/21/2025									
2/22/2025									
2/23/2025									
2/24/2025	16,810	6,424,739	15,256	33,211,021		22,765	City	N	PH 8.86 0700 SK
2/25/2025	8,466	6,433,205	7,010	33,218,031		22,779	City	N	PH 8.60 0650 SK
2/26/2025	6,077	6,439,282	4,676	33,222,707		22,686	City	N	PH 8.46 0700 SK
2/27/2025	1,125	6,440,407	0	33,222,707		22,710	City	N	PH 8.38 0658 SK
2/28/2025									
Totals	186,951	NA	134,918	NA	0	192,510	NA		NA

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Revision Date: 08/29/16

Mar-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	NA	6,440,407	NA	33,222,707	NA	NA	NA		
3/1/2025									
3/2/2025									
3/3/2025	19,362	6,459,769	13,232	33,235,939		22,715	City	N	PH 8.61 6:52 WH
3/4/2025	6,026	6,465,795	4,619	33,240,558		22,758	City	N	PH 8.55 6:45 KM
3/5/2025	51,908	6,517,703	33,000	33,273,558				N	
3/6/2025	19,949	6,537,652	7,363	33,280,921		22,679	City	N	PH 8.08 0738 SK
3/7/2025									
3/8/2025									
3/9/2025									
3/10/2025	15,770	6,553,422	9,940	33,290,861		22,741	City	N	PH 8.15 0738 SK
3/11/2025	17,751	6,571,173	13,296	33,304,157		22,727	City	N	PH 7.99 0736 SK
3/12/2025	19,096	6,590,269	6,661	33,310,818		22,751	City	N	PH 8.25 0620 WH
3/13/2025	10,187	6,600,456	4,696	33,315,514		22,626	City	N	PH 8.04 0605 WH
3/14/2025									
3/15/2025									
3/16/2025									
3/17/2025	25,440	6,625,896	13,862	33,329,376		22,760	City	N	PH 7.92 0650 WH
3/18/2025	9,003	6,634,899	6,555	33,335,931				N	
3/19/2025	1,279	6,636,178	0	33,335,931		22,638	City	N	PH 8.05 8:00 WH
3/20/2025	7,761	6,643,939	5,292	33,341,223		22,671	City	N	PH 8.11 7:45 WH
3/21/2025									
3/22/2025									
3/23/2025									
3/24/2025	27,949	6,671,888	20,884	33,362,107		22,736	City	N	PH 7.88 0711 SK
3/25/2025	2,070	6,673,958	0	33,362,107				N	
3/26/2025	6,069	6,680,027	4,214	33,366,321				N	
3/27/2025	6,903	6,686,930	4,762	33,371,083		22,767	City	N	PH 7.70 0651 WH
3/28/2025									
3/29/2025									
3/30/2025									
3/31/2025	25,060	6,711,990	17,381	33,388,464		22,758	City	N	PH 7.85 0630 WH
Totals	271,583	NA	**165,757**	NA	**0**	295,327	NA		NA

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Revision Date: 08/29/16

Apr-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month	25,060	6,711,990	17,381	33,388,464		22,758	City		
4/1/2025	2,723	6,714,713	1,757	33,390,221				N	
4/2/2025	22,720	6,737,433	20,050	33,410,271				N	
4/3/2025	19,322	6,756,755	11,405	33,421,676		22,758	City	N	PH 7.61 0651 KM
4/4/2025									
4/5/2025									
4/6/2025									
4/7/2025								N	No internet
4/8/2025								N	No internet
4/9/2025								N	No internet
4/10/2025		6,811,000		33,449,119				N	No internet
4/11/2025									
4/12/2025									
4/13/2025									
4/14/2025	5,019	6,816,019	4,280	33,453,399				N	
4/15/2025	10,403	6,826,422	8,469	33,461,868				N	
4/16/2025	8,159	6,834,581	5,926	33,467,794				N	
4/17/2025	1,386	6,835,967	0	33,467,794				N	
4/18/2025									
4/19/2025									
4/20/2025									
4/21/2025	30,040	6,866,007	24,391	33,492,185				N	
4/22/2025	37,090	6,903,097	26,121	33,518,306		22,724	City	N	PH 7.99 0735 SK
4/23/2025	6,732	6,909,829	0	33,518,306		22,719	City	N	PH 8.04 6:23 KM
4/24/2025	6,200	6,916,029	6,167	33,524,473		22,765	City	N	PH 7.92 0729 SK
4/25/2025									
4/26/2025									
4/27/2025									
4/28/2025	28,586	6,938,415	12,955	33,541,396		22,775	City	N	PH 7.97 8:15 KM
4/29/2025	46,201	6,984,616	0	33,541,396		17,024	City	N	PH 8.35 1049 WH
4/30/2025	40,980	7,025,596	6,081	33,547,477		22,719	City	N	PH 8.34 0715 SK
Totals	265,561	NA	127,602	NA	0	153,484	NA		NA

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Ottumwa-Midland Commercial Landfil

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Revision Date: 08/29/16

May-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments	
Last month	NA	7,025,596	NA	33,547,477	NA	NA	NA			
5/1/2025	11,710	7,037,306	6,290	33,553,767				N		
5/2/2025										
5/3/2025										
5/4/2025										
5/5/2025	202,557	7,239,863	17,948	33,571,715		22,758	City	N	PH 8.20 0715 SK	
5/6/2025	Fault		0	33,571,715		22,751	City	N	PH 8.13 0713 SK	
5/7/2025	Fault		0	33,571,715				N		GU-EX 28400 gal
5/8/2025	Fault		2,052	33,573,767				N		
5/9/2025										
5/10/2025										
5/11/2025										
5/12/2025	Fault		15,412	33,589,179				N		GU-EX 34156 gal
5/13/2025	Fault		2,632	33,591,811				N		
5/14/2025	Fault		4,586	33,596,397				N		
5/15/2025	Fault		0	33,596,397		7,986	City	N		GU-EX 17067 gal/ GU-1 3345 gal
5/16/2025										
5/17/2025										
5/18/2025										
5/19/2025	Fault		13,135	33,609,532			City	N		GU-EX 34149 gal
5/20/2025	Fault		28,463	33,637,995		22,775	City	N		GU-EX 5691 gal
5/21/2025	Fault		11,436	33,649,431		22,703	City	N		GU-EX 5686 gal
5/22/2025	Fault		6,945	33,656,376		22,779	City	N		GU-EX 11353
5/23/2025										
5/24/2025										
5/25/2025										
5/26/2025										
5/27/2025	Fault		14,072	33,670,448			City	N		GU-EX 28441 gal
5/28/2025	Fault		0	33,670,448		22,784	City	N		GU-EX 5,688 gal
5/29/2025	Fault		4,685	33,675,133		22,770	City	N		
5/30/2025	Fault		0	33,675,133				N		GU-EX 19832 / GU-1 2911
5/31/2025										
Totals	214,267	NA	**127,656**	NA	**0**	167,306	NA		NA	

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Revision Date: 08/29/16

Jun-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments	
Last month	NA	Fault	NA	33,675,133	NA	NA	NA			
6/1/2025										
6/2/2025		Fault	10,500	33,685,633		5,703	City	N	PH 7.99 WH	GU-EX 22691 gal
6/3/2025		Fault	1,005	33,686,638		17,007	City	N	PH 7.72 WH	
6/4/2025		Fault	19,655	33,706,293		22,688	City	N	PH 7.74 SK	
6/5/2025		Fault	0	33,706,293				N	PH 7.79/GU-EX 7.37 WH	GU-EX 28436 gal
6/6/2025										
6/7/2025										
6/8/2025										
6/9/2025		Fault	14,745	33,721,038		34,062	City	N	PH GU-EX 6.93 WH	
6/10/2025		Fault	4,680	33,725,718		22,727	City	N	PH 8.00 WH	
6/11/2025		Fault	0	33,725,718				N		
6/12/2025		Fault	0	33,725,718			City	N	PH GU-EX 7.03/ GU-1 7.07	GU-EX 20141 gal/ GU-1 2585 gal
6/13/2025										
6/14/2025										
6/15/2025										
6/16/2025		Fault	11,487	33,737,205			City	N	PH GU-EX 6.84	GU-EX 34079 gal
6/17/2025		Fault	0	33,737,205				N		
6/18/2025		Fault	4,311	33,741,516				N		
6/19/2025		Fault	23,736	33,765,252		11,350	City	N	PH 7.96 / GU-EX 6.92 KM	GU-EX 22,688 gal
6/20/2025										
6/21/2025										
6/22/2025										
6/23/2025		Fault	0	33,765,252			City	N	PH GU-EX 6.96	GU-EX 34115 gal
6/24/2025		Fault	45,250	33,810,502		22,683	City	N	PH 7.94/ GU-EX 7.02	GU-EX 11360 gal
6/25/2025		Fault	37,303	33,847,805		33,938	City	N	PH 8.04/ GU-EX 6.92	
6/26/2025		Fault	7,076	33,854,881		17,022	City	N	PH 8.02/GU-EX 6.98	GU-EX 17017 gal
6/27/2025										
6/28/2025										
6/29/2025										
6/30/2025		Fault	22,604	33,877,485			City	N	PH 7.72/GU-EX 7.07	GU-EX 34125 gal
Totals	0	NA	**202,352**	NA	**0**	187,180	NA		NA	

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Ottumwa-Midland Commercial Landfill

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Revision Date: 08/29/16

Jul-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
6/30/2025		Fault	22,604	33,877,485			City	N	
7/1/2025		Fault	0	33,877,485		28,357	City	N	GU-EX 5683 gal
7/2/2025		Fault	8,422	33,885,907		28,355	City	N	GU-EX 5700 gal
7/3/2025		Fault	6,182	33,892,089		17,002	City	N	GU-EX 11376 gal
7/4/2025									
7/5/2025									
7/6/2025									
7/7/2025		Fault	32,515	33,924,604			City	N	GU-EX 34,002 gal
7/8/2025		Fault	6,097	33,930,701		22,707	City	N	GU-EX 11293 gal
7/9/2025		Fault	5,051	33,935,752		22,752	City	N	GU-EX 6,866 gal / GU-1 4,484 gal
7/10/2025		Fault	4,913	33,940,665		22,703	City	N	GU-EX 11271 gal
7/11/2025									
7/12/2025									
7/13/2025									
7/14/2025		Fault	26,099	33,966,764			City	N	GU-EX 34065 gal
7/15/2025		Fault	0	33,966,764		22,722	City	N	GU-EX 11324 gal
7/16/2025		Fault	8,087	33,974,851		22,722	City	N	GU-EX 5676 gal
7/17/2025		Fault	4,950	33,979,801		11,362	City	N	GU-EX 11343 gal
7/18/2025									
7/19/2025									
7/20/2025									
7/21/2025		Fault	45,096	34,024,897		5,691	City	N	GU-EX 28338 gal
7/22/2025		Fault	0	34,024,897		22,770	City	N	GU-EX 5681 gal
7/23/2025		Fault	15,379	34,040,276		22,710	City	N	GU-EX 5,674 gal
7/24/2025		Fault	8,705	34,048,981		22,755	City	N	GU-EX 11355 gal
7/25/2025									
7/26/2025									
7/27/2025									
7/28/2025		Fault	76,969	34,125,950		11,372	City	N	GU-EX 22,710 gal
7/29/2025		Fault	6,885	34,132,835		22,736	City	N	
7/30/2025		Fault	5,149	34,137,984		22,743	City	N	GU-EX 11,362 gal
7/31/2025		Fault	20,837	34,158,821		22,736	City	N	GU-EX 6556 gal/GU-1 4796
Totals	0	NA	**281,336**	NA	**0**	352,195	NA		NA

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Revision Date: 08/29/16

Aug-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
7/31/2025		Fault	20,837	34,158,821		22,736	City	N	**GU-EX 6556 gal/GU-1 4796**
8/1/2025									
8/2/2025									
8/3/2025									
8/4/2025		Fault	25,785	34,184,606		11,384	City	N	GU-EX 22748 gal
8/5/2025		Fault	5,169	34,189,775		21,695	City	N	GU-EX 5681 gal
8/6/2025		Fault	5,113	34,194,888				N	
8/7/2025		Fault	9,105	34,203,993		22,791	City	N	GU-EX 11386 gal
8/8/2025									
8/9/2025									
8/10/2025									
8/11/2025		Fault	27,305	34,231,298		17,067	City	N	GU-EX 17055 gal
8/12/2025		Fault	32,615	34,263,913		22,758	City	N	GU-EX 5693 gal
8/13/2025		Fault	7,939	34,271,852		22,772			GU-EX 5,693 gal
8/14/2025		Fault	5,295	34,277,147		22,760	City	N	GU-EX 5,688 gal
8/15/2025									
8/16/2025									
8/17/2025									
8/18/2025		Fault	26,375	34,303,522		11,376	City	N	GU-EX 22,729 gal
8/19/2025		Fault	7,074	34,310,596		22,719	City	N	GU-EX 5703 gal
8/20/2025			8,529	34,319,125		22,717	City	N	GU-EX 5,688 gal
8/21/2025		Fault	0	34,319,125		17,053	City	N	GU-EX 5683 gal/GU-1 5504
8/22/2025									
8/23/2025									
8/24/2025									
8/25/2025		Fault	27,380	34,346,505			City	N	GU-EX 22,741 gal
8/26/2025		Fault	5,158	34,351,663				N	
8/27/2025		Fault	5,179	34,356,842				N	
8/28/2025		Fault	5,173	34,362,015		17,091	City	N	GU-EX 17,048 gal
8/29/2025									
8/30/2025									
8/31/2025									
Totals	0	NA	**203,194**	NA	**0**	232,183	NA		NA

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Revision Date: 08/29/16

Sep-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month		Fault	5,173	34,362,015	NA	NA	NA		
9/1/2025									
9/2/2025		Fault	24,693	34,386,708			City	N	GU-EX 28,426 gal
9/3/2025		Fault	4,013	34,390,721		5,688	City	N	GU-EX 22,709 gal
9/4/2025		Fault	5,134	34,395,855				N	
9/5/2025		Fault	5,038	34,400,893		22,736	City	N	GU-EX 11,388 gal
9/6/2025									
9/7/2025									
9/8/2025		Fault	15,104	34,415,997		17,050	City	N	GU-EX 11,386 gal
9/9/2025		Fault	5,147	34,421,144		22,755	City	N	
9/10/2025		Fault	4,363	34,425,507				N	
9/11/2025		Fault	0	34,425,507		11,367	City	N	GU-EX 11,386 gal
9/12/2025									
9/13/2025									
9/14/2025									
9/15/2025		Fault	15,328	34,440,835		5,686	City	N	GU-EX 22767 gal
9/16/2025		Fault	5,250	34,446,085				N	
9/17/2025		Fault	5,109	34,451,194				N	
9/18/2025		Fault	0	34,451,194			City	N	GU-EX 17060 /GU-1 5528 gal
9/19/2025									
9/20/2025									
9/21/2025									
9/22/2025		Fault	20,987	34,472,181		11,408	City	N	GU-EX 17,062 gal
9/23/2025		Fault	0	34,472,181		17,072	City	N	
9/24/2025		Fault	5,240	34,477,421		22,712	City	N	GU-EX 5,683 gal
9/25/2025		Fault	8,011	34,485,432		0		N	0
9/26/2025									
9/27/2025									
9/28/2025									
9/29/2025		Fault	10,063	34,495,495		16,997	City	N	
9/30/2025		Fault	4,784	34,500,279				N	
Totals	0	NA	**138,264**	NA	**0**	153,471	NA		NA

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Revision Date: 08/29/16

Oct-25	Daily Total Generated [Wetwell Flow Meter] (Gallons)	Cumulative Total Generated [Wetwell Flow Meter] (Gallons)	Daily Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Cumulative Total Generated [Phase 1 (LV-1) Flow Meter] (Gallons)	Batch Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Cumulative Total to Offsite Treatment [Loading Facility Flow Meter] (Gallons)	Offsite Treatment Location ("OGS" or other)	Ground Water Discharged >25,000 gpd? (Y or N)[1]	Comments
Last month		Fault	4,784	34,500,279				N	
10/1/2025		Fault	0	34,500,279				N	
10/2/2025		Fault	4,934	34,505,213				N	
10/3/2025									
10/4/2025									
10/5/2025									
10/6/2025		Fault	9,889	34,515,102				N	
10/7/2025		Fault	0	34,515,102				N	
10/8/2025		Fault	4,483	34,519,585				N	
10/9/2025		Fault	4,878	34,524,463		22,647	City	N	GU-EX 11,374 gal
10/10/2025									
10/11/2025									
10/12/2025									
10/13/2025		Fault	9,881	34,534,344		22,731	City	N	GU-EX 5691
10/14/2025		Fault	0	34,534,344			City	N	GU-EX 22736
10/15/2025		Fault	0	34,534,344		22,741	City	N	
10/16/2025		Fault	7,778	34,542,122				N	
10/17/2025									
10/18/2025									
10/19/2025									
10/20/2025		Fault	9,702	34,551,824				N	
10/21/2025		Fault	0	34,551,824				N	
10/22/2025		Fault	4,822	34,556,646				N	
10/23/2025		800	3,579	34,560,225		22,799	City	N	GU-1 5710 gal
10/24/2025									
10/25/2025									
10/26/2025									
10/27/2025	10,779	11,579	6,181	34,566,406		10,206	City	N	GU-EX 1147
10/28/2025	6,960	18,539	246	34,566,652				N	
10/29/2025	473	19,012	4,701	34,571,353				N	
10/30/2025	637	19,649	4,207	34,575,560		14,580	City	N	GU-EX 2451
10/31/2025									
Totals	18,849	NA	**75,281**	NA	**0**	115,704	NA		NA

[1] "Ground Water" refers to combination of old cell under-drain water plus storm water discharged form the old storm water pond. Both are discharged to the same wetwell. So, when storm water is discharged, there is no way to estimate the volume of under-drain water discharged, as the two streams are commingled in the wetwell. Storm water is not often discharged. This means that most of the time, but not all of the time, we are able to estimate the volume of under-drain water discharged. Ground water withdrawls that exceed 25,000 gpd would require a DNR water use permit.

Table A-2. Summary of Leachate and Contact Water Quantities Transported to Ottumwa Generating Station or Other Offsite Disposal Location, 2013-2025
Ottumwa-Midland Commercial Landfill
Wapello County, Iowa

	Volume (gallons)												
Month	**2013***	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
January	--	--	46,500	528,115	--	--	--	--	255,594	--	169,013	158,866	295,415
February	--	--	71,300	310,180	--	--	--	--	301,065	91,834	120,820	340,666	192,510
March	41,242	--	--	675,520	--	--	--	59,806	473,255	383,001	355,568	261,273	295,327
April	159,710	--	37,200	531,440	129,817	366,173	--	376,426	342,758	259,322	265,282	419,066	153,484
May	210,988	98,419	182,900	439,047	735,442	486,212	127,770	416,619	367,950	271,152	193,099	767,388	167,306
June	--	23,800	1,036,300	628,126	492,458	--	363,490	401,999	247,168	187,212	90,528	203,399	187,180
July	--	--	770,550	522,497	--	--	--	144,309	598,589	72,802	118,775	158,918	352,195
August	--	--	1,106,800	622,201	--	--	144,477	41,348	103,526	--	90,640	531,850	232,183
September	--	17,000	779,300	563,082	--	916,824	206,826	246,230	90,923	169,815	90,780	168,711	153,471
October	--	--	--	47,187	--	--	579,793	91,055	181,751	87,169	84,706	125,025	115,704
November	--	--	430,190	--	--	--	73,311	101,914	211,827	242,499	28,074	324,614	N/A
December	--	--	2,501,725	--	--	--	133,176	157,652	217,013	156,256	208,518	199,698	N/A
Total	411,940	139,219	6,962,765	4,867,395	1,357,717	1,769,209	1,628,843	2,037,358	3,391,419	1,921,062	1,815,803	3,659,474	2,144,775

-- = No hauling N/A = Data not yet available

*: Quantities for years prior to 2013 were included in previous AWQRs.

Created by: MDB Date: 11/1/2019
Last revision by: MDB Date: 11/3/2025
Checked by: TR Date: 11/5/2025

I:\25225073.00\Deliverables\2025 OML AWQR\App G - Inspection\Attachments\C_LCSPE\Attachments\[A2_Leachate Hauling Table_need final October data.xlsx]Hauled Volume

Attachment B

Leachate Head Measurements

Monthly Leachate Elevation and Head Measurement Records
LP-1
Ottumwa Midland Landfill

Year: 2024

enter blue data
spreadsheet calculates red data

Operator: Keck, Hart, McAninch
Equipment Used: Model 101, Serial number 223320

Revised 10/11/2017

Month	Leachate Piezometer	Location (Phase)	TOC Elev. (NGVD) a	BOC Elev. (NGVD) b	Top of Clay Liner Elev. (NGVD) c	Depth to Leachate (ft) d	Leachate Elev. (NGVD) a-d	Leachate Head at Top of Clay Liner (ft) a-c-d	Date Read/Comments
NA	LP-1	Original Cell	765.18	753.56	753.11	NA	NA	NA	NA
January	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	1/1/2024
February	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	2/4/2024
March	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	3/4/2024
April	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	4/1/2024
May	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	5/1/2024
June	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	6/3/2024
July	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	7/3/2024
August	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	8/5/2024
September	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	9/3/2024
October	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	10/7/2024
November	LP-1	Original Cell	765.18	753.56	753.11	10.75	754.43	1.32	11/4/2024
December	LP-1	Original Cell	765.18	753.56	753.11	11.55	753.63	0.52	12/2/2024

Notes:
1) TOC = Top of Casing. Based on June 15, 2011 survey and boring log/well construction form = 765.18
2) BOC = Bottom of Casing. Based on June 15, 2011 survey and boring log/well construction form = 753.56
3) Top of Clay Liner Elevation based on June 15, 2011 survey and boring log/well construction form = 753.11
4) NGVD = National Geodetic Vertical Datum
5) TBD = To Be Determined, well has not been installed

Monthly Leachate Elevation and Head Measurement Records
LP-1
Ottumwa Midland Landfill

Year: 2025

enter blue data
spreadsheet calculates red data

Operator: Hart, McAninch
Equipment Used: Model 101, Serial number 223320

Revised 10/11/2017

Month	Leachate Piezometer	Location (Phase)	TOC Elev. (NGVD) a	BOC Elev. (NGVD) b	Top of Clay Liner Elev. (NGVD) c	Depth to Leachate (ft) d	Leachate Elev. (NGVD) a-d	Leachate Head at Top of Clay Liner (ft) a-c-d	Date Read/Comments
NA	LP-1	Original Cell	765.18	753.56	753.11	NA	NA	NA	NA
January	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
February	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
March	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
April	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
May	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
June	LP-1	Original Cell	765.18	753.56	753.11	(6)	#VALUE!		
July	LP-1	Original Cell	765.18	753.56	753.11	10.4	754.78	1.67	7/1/2025
August	LP-1	Original Cell	765.18	753.56	753.11	11.15	754.03	0.92	8/4/2025
September	LP-1	Original Cell	765.18	753.56	753.11	11.29	753.89	0.78	9/9/2025
October	LP-1	Original Cell	765.18	753.56	753.11	11.62	753.56	0.45	10/3/2025
November	LP-1	Original Cell	765.18	753.56	753.11	?	#VALUE!	#VALUE!	
December	LP-1	Original Cell	765.18	753.56	753.11	?	#VALUE!	#VALUE!	

Notes:
1) TOC = Top of Casing. Based on June 15, 2011 survey and boring log/well construction form = 765.18
2) BOC = Bottom of Casing. Based on June 15, 2011 survey and boring log/well construction form = 753.56
3) Top of Clay Liner Elevation based on June 15, 2011 survey and boring log/well construction form = 753.11
4) NGVD = National Geodetic Vertical Datum
5) TBD = To Be Determined, well has not been installed

Monthly Leachate Elevation and Head Measurement Records
LH-1
Ottumwa Midland Landfill

Year: 2024

Operator: Keck

Equipment Used: Display

Revised 10/24/2013

Month	Leachate Piezometer	Location (Phase)	TOC Elev. (NGVD) a	BOC Elev. (NGVD) b	Top of Clay Liner Elev. (NGVD) c	Depth to Leachate (ft) d	Leachate Elev. (NGVD) a-d	Leachate Head at Top of Clay Liner (ft) a-c-d	Comments
	LH-1	Phase 1	TBD	TDB	TBD				See Notes
January	LH-1						1.42	0.12	
February	LH-1						2.3	0.19	
March	LH-1						2.92	0.24	
April	LH-1						1.67	0.14	
May	LH-1						7.17	0.60	Leachate Pump issues
June	LH-1						1.8	0.15	
July	LH-1						3	0.25	
August	LH-1						8.3	0.69	Recent heavy rains
September	LH-1						1.9	0.16	
October	LH-1						2.5	0.21	
November	LH-1						5	0.42	
December	LH-1						2.3	0.19	

Notes:
1) TOC = Top of Casing. Based on _____ survey and boring log/well construction form.
2) BOC = Bottom of Casing. Based on _____ survey and boring log/well construction form.
3) Top of Clay Liner Elevation based on _____ survey and boring log/well construction form.
4) NGVD = National Geodetic Vertical Datum
5) TBD = To Be Determined, well has not been installed

Note: The liner elevation at transducer location in LH-1 is 753.59 feet per the November 2015 Phase 1 Liner Construction Documentation Report prepared by SCS. (Source: Email from Eric Nelson, 10/18/2017, 1:18 PM.)

How to use this spreadsheet: (RJS 10/19/2017):
1. Enter the leachate head level from the transducer panel located near Leachate Vault-1 (LV-1) in column J in decimal feet.
2. Add the observed leachate level to the liner elevation at transducer location LH-1. Enter this value into column I. This will represent the leachate head elevation above the liner.

For example: The observed leachate level in 0.375 ft on the digital readout for LH-1. Enter this into column J. Add 0.375 to the liner elevation at LH-1 to get the elevation of the leachate: 753.59 + 0.375 = 753.965. Enter this value into column I.

From Eric Nelson (10/18/2017, 1:18 PM):
The text referenced for leachate headwell measurements and the monitoring forms were originally prepared for and fit best to LP-1, which is located on the south facing slope of the existing landfill. We've made this easier with the direct read-out of leachate head in the expansion, so no physical measurement has to be made for LH-1. For LH-1 in Expansion Phase 1 the leachate head can be directly read from the panel adjacent to the vault. I've attached a mockup of how I would fill out this monitoring form with data I simply made up. It looks like we missed updating this in the recent permit renewal version of the Ops Manual to reflect the installation of the transducer/remote readout system in Phase 1.

Monthly Leachate Elevation and Head Measurement Records
LH-1
Ottumwa Midland Landfill

Year: 2025

Operator:

Equipment Used: Display

Revised 10/24/2013

Month	Leachate Piezometer	Location (Phase)	TOC Elev. (NGVD) a	BOC Elev. (NGVD) b	Top of Clay Liner Elev. (NGVD) c	Depth to Leachate (ft) d	Leachate Elev. (NGVD) a-d	Leachate Head at Top of Clay Liner (ft) a-c-d	Comments
	LH-1	Phase 1	TBD	TDB	TBD				See Notes
January	LH-1						7.7	0.64	
February	LH-1						3.75	0.31	
March	LH-1						2.27	0.19	
April	LH-1						2.67	0.22	
May	LH-1						2.67	0.22	
June	LH-1						2	0.17	
July	LH-1								
August	LH-1						-1.2		sensor malfunction
September	LH-1								
October	LH-1						-1.2		sensor malfunction
November	LH-1								
December	LH-1								

Notes:
1) TOC = Top of Casing. Based on _____ survey and boring log/well construction form.
2) BOC = Bottom of Casing. Based on _____ survey and boring log/well construction form.
3) Top of Clay Liner Elevation based on _____ survey and boring log/well construction form.
4) NGVD = National Geodetic Vertical Datum
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For example: The observed leachate level in 0.375 ft on the digital readout for LH-1. Enter this into column J. Add 0.375 to the liner elevation at LH-1 to get the elevation of the leachate: 753.59 + 0.375 = 753.965. Enter this value into column I.

From Eric Nelson (10/18/2017, 1:18 PM):
The text referenced for leachate headwell measurements and the monitoring forms were originally prepared for and fit best to LP-1, which is located on the south facing slope of the existing landfill. We've made this easier with the direct read-out of leachate head in the expansion, so no physical measurement has to be made for LH-1. For LH-1 in Expansion Phase 1 the leachate head can be directly read from the panel adjacent to the vault. I've attached a mockup of how I would fill out this monitoring form with data I simply made up. It looks like we missed updating this in the recent permit renewal version of the Ops Manual to reflect the installation of the transducer/remote readout system in Phase 1.

Attachment C

Leachate Line Jetting Documentation

Interstate Power & Light Company
1031 Iowa St. Suite # 5007
Dubuque IA 52001-5007

October 11, 2023

Attn: Steve Keck
Fly Ash Disposal Foreman
Ottumwa Midland Landfull

Services renderred at Ottumwa Midland Landfill, 15300 130th Street, Ottumwa IA 52501

We, George Boitnott Enterprises, Inc. were on site on 10/10/23 & 10/11/23 to jet the lateral lines at the Ottumwa Midland Landfill using 3,500 gallons of water. All lines were clean with no blockages found while jetting of any lines.

Sincerely,

Kevin McIntosh
George Boitnott Enterprise Service Supervisor.

George & Jeff Boitnott Enterprises, Inc.
735 Gateway Drive • P.O. Box 157 • Ottumwa, IA 52501
☎ 641-682-5157 or 1-800-373-9433 • Fax 641-682-6872

Attachment D

IDNR Landfill Compliance Visit Report

June 22, 2021

Alliant Energy Corporate Services, Inc.
Attn: Tasha Campbell, Environmental Specialist II
4902 North Bitmore Lane
Madison, WI 53718

Subject: Ottumwa-Midland CCR Landfill Compliance Visit
Facility No: 90-SDP-08-92P

Dear Ms. Campbell:

On June 1, 2021 I met with Rob Saunders, Blake McClaflin and Steve Keck to conduct a compliance visit at the Ottumwa-Midland CCR Landfill. Please review the enclosed report which outlines various items discussed and observed during the course of our visit.

If you have any questions or would like further explanation of any part of this report, please contact me at this office at 319-653-2135 or at ryan.stouder@dnr.iowa.gov.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Ryan Stouder

Ryan Stouder
Environmental Specialist Senior

Encl. SDP Visit Report

N:\SHARED\SW 2021\Midland CCR visit cover 060121

xc: Becky Jolly, IDNR Solid Waste Section, via email
Alliant Energy, Attn:Rob Saunders, 20775 Powerplant Rd, Ottumwa, IA 52501 (w/encl)
Ottumwa Midland CCR SW File

IOWA DEPARTMENT OF NATURAL RESOURCES
Field Office 6
1023 West Madison, Washington, IA 52353
319-653-2135
Sanitary Landfill Visit

Permit #: 90-SDP-08-92P **Date this Visit:** 06/01/2021 **Previous Visit Date:** 9/11/12

Weather Conditions at Time of Visit: 73 deg. F, Sunny, Wind: South 5 mph

Person(s) Contacted: Rob Saunders, Blake McClaflin, Steve Keck

Were deficiencies noted or significant observations made during this inspection?
Yes – See Comments Sec., No – No deficiencies noted, Blank – Not applicable or observed, PND – Previously Noted Deficiency

Observations

Yes	No	PND	Item	Yes	No	PND	Item
☐	☒	☐	1. Fill Cover: daily; intermediate; final	☐	☐	☐	10. Special Waste Handling
☐	☒	☐	2. Control of Face: slope; width; location	☐	☒	☐	11. ERRAP/GP1
☐	☒	☐	3. Compaction	☐	☒	☐	12. Operator Certification
☐	☒	☐	4. Cover erosion; minor rills	☐	☒	☐	13. Staffing
☐	☒	☐	5. Drainage into fill	☐	☒	☐	14. Equipment Backup/Maintenance
☐	☒	☐	6. Leachate Mgmt. & Control	☐	☒	☐	15. Interior Roads
☐	☒	☒	7. Fugitive Dust	☐	☒	☐	16. Perimeter fence, gate, signs, mon. wells
☐	☒	☐	8. Wet Weather Area	☐	☒		17. Photos taken
☐	☐	☐	9. Construction & Demolition Area	☐	☒		18. Follow-up needed

Comments: Expansion phase 1 is being utilized, this area has been used for the past 3 or 4 years. Most of the bottom ash comes from the Ottumwa Generating Station and some loads come from the Prairie Creek Cedar Rapids plant. The ash material was being spread at the time of my visit. No fugitive dust issues were observed. A water truck usually follows the drier material, the weather conditions have been moderately wet so not as much water has been utilized. The main working face is covered with soil. The soil cover is from the stockpile north or the sides of the main working face. There was minor erosion in the area near the working face.

The haul roads are well maintained with ditches designed convey stormwater runoff offsite. The older portions of the landfill have a well-established grassed cover. This area is mowed and maintained as needed to prevent tree growth.

The leachate pond observed in the discharge area on the northwest corner. The area around the leachate pond was absent of trees and maintained with gravel to reduce woody plants. A leachate pond loadout is located near the main gate and office. I was able to review records of ash deliver loads and CCR well monitoring data, landfill operation and policy guidance.

No issues were observed with the monitoring wells located around the landfill property.

AUTHENTICATION

INSPECTOR: Ryan Stouder Ryan Stouder

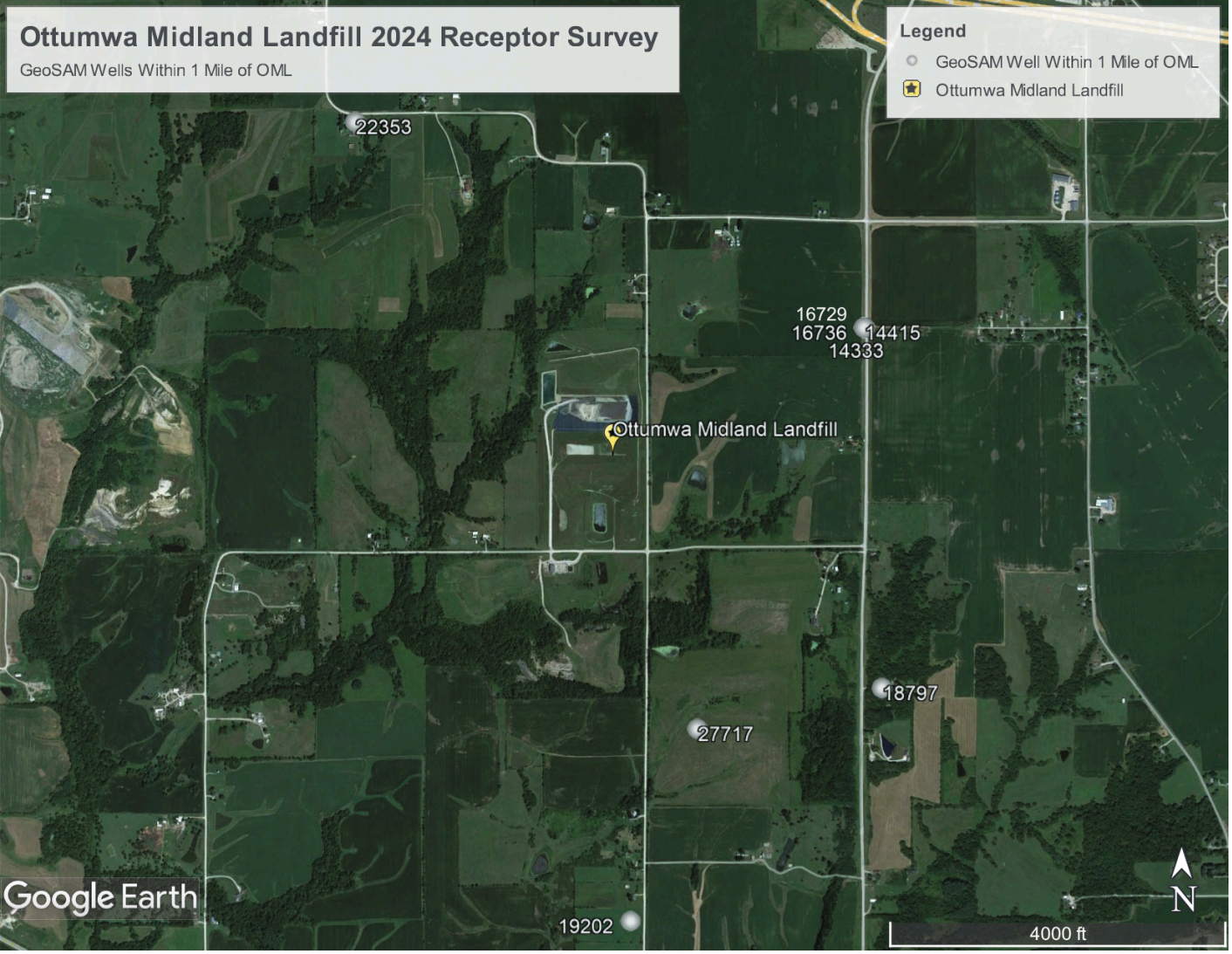
REVIEWER: Kurt Levetzow Kurt Levetzow 6/24/21

Appendix H

Receptor Survey

GeoSAM Search Results Within 1 Mile of Ottumwa Midland Landfill, November 2024

wnumber	14415	14333	16729	16736	19202	18797	27717	22353
FID	12809	13863	15268	15284	16115	16556	24587	
owner_name	Ward, Robert	Ward, R.L.	Peterson, Ed	Ward, Robert	Sondoge, H.	Behringer, Bob	Rogers, Ratherine	Crady, Dale
alt_name				#3	BAILER, KEN			
pwts_id	0	0	0	0	0	0	0	0
project	Geologic Data Preservation	Geologic Data Preservation	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
operator	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
county	Wapello	Wapello	Wapello	Wapello	Wapello	Wapello	Wapello	Wapello
quad	Ottumwa North,	Ottumwa North,	Ottumwa North,	Ottumwa North,	Ottumwa North,	Ottumwa North,	Ottumwa North,	Ottumwa North,
township	T73N	T73N	T73N	T73N	T72N	T72N	T72N	T73N
range	R14W	R14W	R14W	R14W	R14W	R14W	R14W	R14W
section	35	35	35	35	3	2	2	34
quarter					SE NE SE NE	NE SW SW NW	NW SW	NW NE NE NW
latitude	41.082826	41.082826	41.082826	41.082826	41.063432	41.071081	41.069743	41.089533
longitude	-92.438689	-92.438689	-92.438689	-92.438689	-92.448759	-92.437911	-92.445914	-2.460711
ll_acc	Calc. +/- 3730 ft.	Calc. +/- 3730 ft.	Calc. +/- 3730 ft.	Calc. +/- 3730 ft.	Calc. +/- 230 ft.	Calc. +/- 230 ft.	Calc. +/- 930 ft.	Calc. +/- 230 ft.
utm_x	547148	547148	547148	547148	546316	547222	546550	545294
utm_y	4548103	4548103	4548103	4548103	4545945	4546800	4546647	4548836
elevation	842	842	842	842	745	785	784	832
elev_acc	Digital Elevation Model Accurate to 10 ft	Digital Elevation Model Accurate to 10 ft	Digital Elevation Model Accurate to 10 ft	Digital Elevation Model Accurate to 10 ft	Topo Map Accurate to 5 ft	Unknown	Digital Elevation Model Accurate to 5 ft	Digital Elevation Model Accurate to 5 ft
field_loca	0	0	0	0	0	0	0	No
site_type	Drilled hole	Drilled hole	Drilled hole	Drilled hole	Drilled hole	Drilled hole	Drilled hole	Drilled hole
position	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
dpth_br	0	0	0	0	20	10	15	40
dpth_well	30	30	31	39	155	293	152	208
dpth_tot	30	30	31	39	155	293	152	208
drill_comp	Schlicher Well Co.	Schlicher Well Co.	Schlicher Well Co.	Schlicher Well Co.	Schlicher Well Co.	Verwers Well Co.	Bruinekool, Dwayne	Schlicher Well Co.
icon	3	3	2	2	2	2	0	
drl_date	22-Oct-62	30-May-62	31-Oct-63	30-Oct-63	8-Oct-66	6-Apr-66	3-May-85	11/6/1968
aquifer					Mississippian	Mississippian		
well_type	Unknown	Unknown	Unknown	Private	Private	Private	Private	Private
smpl_type	Chips	Chips	Chips	Chips	Chips	Chips	Chips	
log_drlr	1	1	0	0	0	0	0	1
log_strp	1	1	1	1	1	1	0	1
log_geop	0	0	0	0	0	0	0	0
log_other	0	0	0	1	0	0	1	0
HLINK	https://www.iihr.uiowa.edu/igs/geosam/well/14415/general-	https://www.iihr.uiowa.edu/igs/geosam/well/14333/general-	https://www.iihr.uiowa.edu/igs/geosam/well/16729/general-	https://www.iihr.uiowa.edu/igs/geosam/well/16736/general-	https://www.iihr.uiowa.edu/igs/geosam/well/19202/general-	https://www.iihr.uiowa.edu/igs/geosam/well/18797/general-	https://www.iihr.uiowa.edu/igs/geosam/well/27717/general-	https://www.iihr.uiowa.edu/igs/geosam/well/22353/general-
x	-10290227.79	-10290227.79	-10290227.79	-10290227.79	-10291348.78	-10290141.18	-10291032.07	
y	5024566.1666414365	5024566.1666414365	5024566.1666414365	5024566.1666414365	5021702.376307149	5022831.7552704625	5022634.189370096	


Ottumwa Midland Landfill 2024 Receptor Survey
GeoSAM Wells Within 1 Mile of OML
Legend
GeoSAM Well Within 1 Mile of OML
Ottumwa Midland Landfill
22353
16729
16736
14415
14333
Ottumwa Midland Landfill
18797
27717
19202
Google Earth
N
4000 ft