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November 30, 2022

Mr. Mick Leat
Land Quality Bureau
Iowa Department of Natural Resources
502 East 9th Street
Des Moines, IA 50319-0034

**Subject: 2023 Annual Water Quality Report
Interstate Power and Light Company – Lansing Landfill
Permit #03-SDP-05-01P**

Dear Mr. Leat:

On behalf of Interstate Power and Light Company (IPL), Alliant Energy is providing the enclosed 2023 Annual Water Quality Report for the landfill at the Lansing Generating Station, as required by Permit #03-SDP-05-01P 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,

A handwritten signature in dark ink, appearing to read "Jenny Coughlin", is written over a light blue rectangular background.

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

Enclosures

Cc: IDNR Field Office #1
Brian Rath – IDNR
Robin Nelson – IPL
Meghan Blodgett, Thomas Karwoski – SCS Engineers

2023 Annual Water Quality Report

Interstate Power and Light Company Lansing Generating Station CCR Landfill Permit #03-SDP-05-01P

Alliant Energy
4902 North Biltmore Lane
Madison, Wisconsin 53718

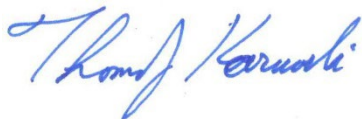
SCS ENGINEERS

25223070.00 | November 30, 2023

2830 Dairy Drive
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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 30, 2023

Date

Pages or Sheets Covered by this Certification:

2023 Annual Water Quality Report and Additional Groundwater Assessment
Report – November 2023, Interstate Power and Light Company, Lansing
Generating Station CCR Landfill

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EXECUTIVE SUMMARY

Period of Report Coverage

The period of coverage for this report is 2023 and includes the April 2023 annual groundwater sampling event conducted at the Lansing Generating Station Coal Combustion Residual (CCR) Landfill (Site) located in Lansing, Iowa (**Figure 1**).

Report Priority

One new Groundwater Protection Standard (GWPS) exceedance was identified during the 2023 groundwater monitoring event:

- TW-18: Cobalt

Most exceedances of the background Upper Prediction Limits (UPLs) were consistent with previous results. There were no new UPL exceedances.

There was one well/constituent pair with a UPL exceedance in 2022 for which 2023 results did not exceed the 2023 UPL. The total number of well/constituent pairs with UPL exceedances increased slightly from 2022 to 2023.

SCS Engineers recommends that the current monitoring program be continued during 2024.

No additional requests or amendments to the permit are needed at this time.

Site Status and Applicable Rules

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

- **Landfill Status:** Closed. Permit # 03-SDP-05-01P. The landfill was closed in 2023. Closure documentation will be submitted under separate cover.
- **Types of Wastes Accepted:** The Lansing landfill is a monofill that primarily accepted CCR generated from coal combustion at the Lansing Generating Station.
- **Applicable Iowa Administrative Code (IAC) Rules:** The monitoring was performed, and this report was prepared, in accordance with the requirements of IAC Chapter 567-103, and certain provisions of 567-115.26(6). IAC 567-115.21 were 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 special provisions of the landfill permit, dated October 10, 2013; the variance to IAC Chapter 567-103.1(2)f granted on December 14, 2015; and with Amendments #1 through #3.

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Table of Contents

Section	Page
Certification	i
Executive Summary	iii
Table of Contents	v
Acronyms/Abbreviations	vii
1.0 Site Background.....	1
1.1 Site History.....	1
1.2 Site Hydrogeology	1
1.2.1 Geology.....	1
1.2.2 Hydrogeology/Groundwater Flow Conditions	1
2.0 Sampling Status Summary	2
3.0 Monitoring Well Maintenance and Performance Summary.....	3
3.1 Well Maintenance Recommendations	3
4.0 2023 Quality Assurance/Quality Control Summary.....	4
4.1 Sample Collection and Handling	4
4.2 Analytical Sensitivity and Blanks	4
4.3 Accuracy.....	4
4.4 Data Quality Summary	5
5.0 Comparison to Standards	5
5.1 Statistical Analysis.....	5
5.2 2023 Results.....	5
5.3 Standards History	6
6.0 Summary of Findings	6
7.0 Recommendations.....	6

Tables

Table 1.	Monitoring Program Summary
Table 2.	Monitoring Program Implementation Schedule
Table 3.	Monitoring Well Maintenance and Performance Reevaluation Schedule
Table 4.	Monitoring Well Maintenance and Performance Summary
Table 5.	Background and GWPS Summary
Table 6.	Summary of Well/Detected Constituent Pairs with No Immediately Preceding UPL Exceedances
Table 7.	Summary of Ongoing and Newly Identified SSIs
Table 8.	Historic SSIs & Groundwater Protection Standard Exceedances
Table 9.	Historic Prediction Limits and Groundwater Protection Standards
Table 10.	Groundwater Quality Trend Summary

Figures

- Figure 1 Site Location Map
- Figure 2 Site Plan and Monitoring Well Locations
- Figure 3 Water Table Map, April 10-11, 2023

Appendices

- Appendix A Groundwater Sampling Field Sheets
- Appendix B Laboratory Analytical Report
- Appendix C Summary of Groundwater Chemistry – Pre-2019
- Appendix D Statistical Evaluation of Groundwater Monitoring Results
- Appendix E Trend Analysis
- Appendix F Standards History Graphs

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ACRONYMS/ABBREVIATIONS

AWQR = Annual Water Quality Report
CCR = Coal Combustion Residual
COC = Chain of Custody
DO = Dissolved Oxygen
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
ORP = Oxidation Reduction Potential
QA/QC = Quality Assurance/Quality Control
RCRA = Resource Conservation and Recovery Act
RL = Reporting Limits
SSI = Statistically Significant Increase over background
Site = Lansing Generating Station Coal Combustion Residual Landfill
UPL = Upper Prediction Limits
U.S. EPA = U.S. Environmental Protection Agency
Unified Guidance = U.S. Environmental Protection Agency Unified Guidance for Statistical
Analysis of Groundwater Monitoring Data at Resource Conservation and
Recovery Act Facilities

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1.0 SITE BACKGROUND

1.1 SITE HISTORY

The Lansing Generating Station Coal Combustion Residual (CCR) Landfill (Site) is located on Power Plant Drive, approximately 3 miles southeast of the City of Lansing, Iowa. The site of the current CCR landfill first received CCR between 1985 and 1987 and was temporarily closed in 1994. On September 11, 2003, a new disposal permit (03-SDP-05-01P) was issued for the Site and CCR placement resumed. The landfill permit was renewed by the Iowa Department of Natural Resources (IDNR) on October 10, 2013. An aerial photo of the Site is shown on **Figure 2**. CCR generated from the Lansing Generating Station was the primary material disposed in the landfill.

The landfill and adjacent settling pond were closed in 2023. The construction of the landfill final cover was substantially complete on September 15, 2023. Certification of closure of the landfill was submitted to the United States Army Corps of Engineer (USACE) on October 16, 2023. Closure documentation is being submitted under separate cover.

The landfill is also subject to the federal CCR Rule (40 CFR 257.50-107), including the federal groundwater monitoring requirements. Some wells shown on **Figure 2** were installed to meet the federal requirements but are not currently sampled as part of the state monitoring program. Additional information on the CCR Rule monitoring wells, including sampling results, can be found on the Alliant Energy CCR Rule Compliance Data and Information web site (<http://ccr.alliantenergy.com>).

1.2 SITE HYDROGEOLOGY

1.2.1 Geology

The landfill is bordered on the northeast by bedrock bluffs and on the southwest by an intermittent creek. Historically, the Site was used for farming.

Based upon the soil boring logs from MW-11 (abandoned), MW-11R, and MW-12P, located in the soil berm along the Site, the native soils below the berm include sand, silt, silty clay, organic silt, and silt with gravel. At MW-14, TW-15, TW-16, and TW-17, near the creek located to the southwest of the landfill, silty sand with gravel was encountered from the ground surface to the final boring depths.

On the northeast side of the CCR landfill, in the vicinity of former wells MW-4 and MW-5, the stratigraphy includes a fill layer of 0 to 1.5 feet, underlain by a talus material made up of sandy silt with dolomite or quartz gravel. This talus layer extends to a depth of 6 feet and is underlain by interbedded sandstone and siltstone, to the maximum boring depth of 78 feet. At MW-13, located at the base of the bluff to the east of the CCR settling pond, the talus layer extends to a depth of at least 22 feet; bedrock was not encountered during drilling at this location.

1.2.2 Hydrogeology/Groundwater Flow Conditions

Groundwater levels were measured during April 2023, prior to purging the wells for sampling. The groundwater elevation data, including calculated vertical gradients at monitoring well nests, are presented in **Table 4**. The 2023 water level data were used to create a groundwater flow map (**Figure 3**). Groundwater levels in the vicinity of the settling pond were affected in April 2023 by dewatering activities related to pond closure. The groundwater flow direction within the landfill area in April 2023 appears to be to the west-northwest, generally parallel to the valley in which the landfill

is constructed. The water table elevation contours are consistent with those mapped during previous sampling events at the site. Groundwater flow also appears to flow outward from a large hill between the landfill area and the Mississippi River. The water table contours drawn on **Figure 3** in the area of this hill are inferred based on the local topography and known water table elevations at the monitoring wells surrounding the hill. Based on the topography and the mapped spring southwest of the site, it is likely that most groundwater flow on the southwest side of the valley, southwest of County Road X52, is generally to the north, with converging groundwater flow in the valley. Water levels in TW-17, TW-18, and TW-19 have supported this interpretation. Historically, the shallow flow direction in this area varies between northeast, southwest, and toward the creek from both the northeast and southwest.

A slurry wall was constructed in 2015 within the berm on the southwest side of the CCR settling pond. The slurry wall does not appear to have any effect on site-wide groundwater flow. It likely does affect local flow in the immediate area of the wall.

Vertical groundwater flow gradients were calculated for the three well clusters at the site, MW-2/MW-3, MW-12/MW-12P, and MW-22/MW-22P. The calculated gradients are shown in **Table 4**. The calculated vertical gradients for April 2023 are consistent with historical gradients.

- Monitoring wells MW-4 and MW-5 were abandoned in 2018; historical vertical gradients at this well cluster were consistently upward.
- The vertical gradient at MW-2/MW-3 was upward during the April 2023 monitoring event.
- The vertical gradient at MW-12/MW-12P was downward during the April 2023 monitoring event.
- The vertical gradient at MW-22/MW-22P was downward during the April 2023 monitoring event.

2.0 SAMPLING STATUS SUMMARY

The Iowa Department of Natural Resources (IDNR) has 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 the Site.

Field sheets from 2023 are included in **Appendix A**. Sampling completed in 2018 through 2023 and anticipated sampling for 2024 are summarized in **Table 2**. The laboratory analytical report from 2023 is included in **Appendix B**. Historical groundwater chemistry summary tables for sampling performed before 2019 are included in **Appendix C**. Summary tables of groundwater chemistry data for sampling performed since transitioning to unfiltered sampling in 2016 are included with the statistical analysis in **Appendix D**.

Monitoring wells MW-13 and MW-15 were dry and could not be sampled during the April 2023 sampling event. This was attributed to ongoing dewatering activities related to closure of the settling pond.

3.0 MONITORING WELL MAINTENANCE AND PERFORMANCE SUMMARY

Iowa Administrative Code (IAC) 67-115.21 was referenced for monitoring well maintenance and evaluation, in place of the rescinded 567-110.9. **Table 3** provides the year 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 once annually at the Site. The locations and screened intervals of site monitoring wells appear to be appropriate, with the potential exception of monitoring wells in the immediate vicinity of the settling pond if low water levels persist in this area post-closure. Vertical gradients at monitoring well nests MW-2/MW-3, MW-12/MW-12P, and MW-22/MW-22P are presented in **Table 4**.

- 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.*

As described in **Section 1.2.2**, comparison of the 2023 groundwater contour map and calculated vertical gradients to previous data indicates that the April 2023 groundwater flow conditions are consistent with historical conditions with the exception of dry wells affected by dewatering. The dominant groundwater flow direction for the Site is to the northwest along the axis of the valley in which the Site is located. Groundwater flow conditions will be evaluated in 2024, after the pond and landfill closure activities are completed, and further recommendations will be made if it is found that closure activities have affected groundwater flow patterns at the site.

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

Well depths measured during 2023 in all wells that do not contain dedicated pumps are summarized in **Table 4**. The difference between the as-installed total depths and the measured total depths for all wells without pumps were less than 1 foot, with the exception of MW-22. The measured total depth at MW-22 in 2023 may represent a measurement error, and will be checked again during the next monitoring event.

- 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.*

The monitoring wells appear to be functioning as intended and are yielding representative samples. Monitoring wells will be repaired or replaced if they are damaged, become dry, or fill with sediment. In-situ permeability testing is not a requirement of IAC 567-103, and IDNR staff confirmed via email on January 25, 2021, that in-situ permeability testing is not required for wells at the Site.

3.1 WELL MAINTENANCE RECOMMENDATIONS

No well maintenance activities are recommended based on observations during the April 2023 sampling event.

4.0 2023 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 were reviewed to confirm that information was complete.

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 groundwater samples to assess whether cross-contamination occurred during sample handling and transport.

The sample from MW-11R for magnesium analysis was diluted due to the nature of the sample matrix. An elevated reporting limit (RL) is provided for this parameter. The detected concentration of magnesium in MW-11R is within the range of historical magnesium concentrations at this well.

There were no detections in the April 2023 field blank samples or laboratory method blanks.

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, MS/MSD samples are not reported for every sample set and are not included in the 2023 analytical report for the Site. LCS results reported in the April 2023 analytical laboratory report were within control limits, with the exception of a high recovery on the LCS for iron. No flags indicating other QA/QC issues were attached to the results.

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 laboratory samples were rejected as unusable due to QC failures.

5.0 COMPARISON TO STANDARDS

5.1 STATISTICAL ANALYSIS

Statistical analysis is completed for the Site on an annual basis. The 2023 Annual Statistical Summary Report is included in **Appendix D**, including a summary table of data used for the statistical analysis for each parameter. **Table 5** provides the background and Groundwater Protection Standard (GWPS) summary for the Site.

Groundwater samples collected in 2023 were unfiltered, in accordance with the variance to 567 103.1(2)f, and Amendment #3 to the Sanitary Disposal Permit, granted on December 14, 2015. The 2023 sampling event was the eighth round of unfiltered samples collected at the site, and 2023 was the fifth 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-6 used as the background well. Monitoring results from the downgradient wells were compared to the upper prediction limits (UPLs) to evaluate whether a statistically significant increase (SSI) over background has occurred. UPL calculations were updated in 2023 to incorporate the April 2023 sample results at MW-6.

Detection of an SSI at a compliance well indicates that the groundwater quality is different from 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 standards consistent with previous Annual Water Quality Reports (AWQRs).

5.2 2023 RESULTS

Table 6 is a summary of monitoring points/detected constituents from the 2023 sampling events that did not exceed a UPL. **Table 7** provides a summary of ongoing and newly identified SSIs and compares these concentrations to regulatory standards.

Table 8 provides a visualization of historic SSIs and regulatory standard exceedances since 2016, the first year during which unfiltered samples were collected at the site. **Table 8** does not identify SSI exceedances prior to 2019, as that was the first year UPLs were calculated.

The April 2023 sampling event was the eighth round of samples collected since the site transitioned to unfiltered sampling. Trend analyses were performed for parameters with regulatory exceedances. Trend analyses for well/constituent pairs with GWPS exceedances are summarized in **Table 10**. No

significant trends were identified for these well/constituent pairs. Trend test results and associated graphs are included in **Appendix E**.

5.3 STANDARDS HISTORY

The standards history for 2019 to 2023 is summarized in **Table 9**. Graphs of standards history are included in **Appendix F**. There were no changes to the GWPSs in 2023. The UPLs were updated to reflect the additional sampling event in April 2023.

6.0 SUMMARY OF FINDINGS

One new GWPS exceedance was identified during the 2023 groundwater monitoring event:

- TW-18: Cobalt

Most exceedances of the background UPLs were consistent with previous results. There were no new UPL exceedances.

There was one well/constituent pair with a UPL exceedance in 2022 for which 2023 results did not exceed the 2023 UPL. UPL exceedances at MW-13 and MW-15 in 2022 could not be further evaluated in 2023 because these wells were dry. The total number of well/constituent pairs with UPL exceedances increased slightly from 2022 to 2023.

GWPS exceedances identified in **Table 8** are consistent with data from previous years with the exception of the new GWPS exceedance for cobalt at TW-18. Wells with GWPS exceedances in 2023 were MW-11R, MW-12, and TW-18. Standards exceedances identified at MW-11R and MW-12 (arsenic, cobalt, and/or manganese) appear to reflect impacts from both the CCR landfill and reducing conditions related to organic soils. An evaluation of reducing conditions was presented in the 2014 AWQR, and subsequent field dissolved oxygen (DO) and oxidation reduction potential (ORP) measurements show that reducing conditions persist at MW-11R and MW-12.

7.0 RECOMMENDATIONS

SCS Engineers recommends that the current monitoring program be continued during 2024.

Tables

- 1 Monitoring Program Summary
- 2 Monitoring Program Implementation Schedule
- 3 Monitoring Well Maintenance and Performance
Reevaluation Schedule
- 4 Monitoring Well Maintenance and Performance
Summary
- 5 Background and GWPS Summary
- 6 Summary of Well/Detected Constituent Pairs with No
Immediately Preceding UPL Exceedances
- 7 Summary of Ongoing and Newly Identified SSIs
- 8 Historic SSIs & Groundwater Protection Standard
Exceedances
- 9 Historic Prediction Limits and Groundwater Protection
Standards
- 10 Groundwater Quality Trend Summary

Table 1
Monitoring Program Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Monitoring Well	Formation	Current Monitoring Program	Change for Next Sampling Event	Constituent(s) with SSI	Constituent(s) with GWPS Exceedance	Total # of Samples in Each Monitoring Program Since January 1, 2018
						Routine
Sampled Monitoring Wells						
MW-6	Bedrock	Routine	NC	None	None	6
MW-11R	Unconsolidated	Routine	NC	Alkalinity, arsenic, barium, boron, calcium, chloride, cobalt, iron, magnesium, manganese, nickel, potassium, sodium, strontium	Arsenic, cobalt, manganese	6
MW-12	Unconsolidated	Routine	NC	Alkalinity, arsenic, barium, boron, cobalt, iron, manganese, potassium, sodium, sulfate	Arsenic, manganese	6
MW-12P	Unconsolidated	Routine	NC	Alkalinity, arsenic, barium, boron, calcium, chloride, magnesium, potassium, sodium, strontium, sulfate	None	6
MW-13 ⁽²⁾	Unconsolidated	Routine	NC	--	--	5
MW-14	Unconsolidated	Routine	NC	None	None	6
MW-15 ⁽²⁾	Unconsolidated	Routine	NC	--	--	5
TW-18	Unconsolidated	Routine	NC	Alkalinity, barium, boron, calcium, chloride, cobalt, iron, manganese, potassium, sodium, strontium	Cobalt, manganese	6

Table 1
Monitoring Program Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Monitoring Well	Formation	Current Monitoring Program	Change for Next Sampling Event	Constituent(s) with SSI	Constituent(s) with GWPS Exceedance	Total # of Samples in Each Monitoring Program Since January 1, 2018
						Routine
Water Level Only Monitoring Wells						
MW-1	Bedrock	Routine ⁽¹⁾	NC	None	None	6
MW-2	Bedrock	Routine ⁽¹⁾	NC	None	None	6
MW-3	Bedrock	Routine ⁽¹⁾	NC	None	None	6
MW-18	Bedrock	Routine	NC	None	None	6
MW-19	Bedrock	Routine	NC	None	None	6
MW-22	Bedrock	Routine	NC	None	None	6
MW-22P	Bedrock	Routine	NC	None	None	6
TW-17	Unconsolidated	Routine	NC	None	None	6
TW-19	Unconsolidated	Routine	NC	None	None	6

Notes and Abbreviations:

SSI = Statistically Significant Increase

GWPS = Groundwater Protection Standard

NC = No Change

1: MW-1, MW-2, and MW-3 are not sampled but are used voluntarily as groundwater elevation measurement points, in accordance with the October 10, 2013 Permit Renewal.

2: MW-13 and MW-15 were dry during the April 2023 sampling event.

Updated by: RM, 8/4/2023

Checked by: LH, 10/9/2023

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Table 2
Monitoring Program Implementation Schedule
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Monitoring Well	Recent Sampling Dates and Constituents						Upcoming Sampling Dates and Constituents
	April 17-16, 2018	April 15-16, 2019	May 20-22, 2020*	April 7-9, 2021	April 4-7, 2022, June 2, 2022**	April 10-11, 2023	April 2024
MW-6	List A	List A	List A	List A	List A	List A	List A
MW-11R							
MW-12							
MW-12P							
MW-13							
MW-14							
MW-15							
TW-18							
MW-1	Water Level	Water Level	Water Level	Water Level	Water Level	Water Level	Water Level
MW-2							
MW-3							
MW-18							
MW-19							
MW-22							
MW-22P							
TW-17							
TW-19							

Comments:

*: April 2020 sampling was delayed to May 2020 due to the COVID-19 pandemic. IDNR approval for the delay was granted by email on April 10, 2020.

**: Alkalinity was inadvertently left off the analysis list by the laboratory in April 2022 for all samples except MW-6. The affected wells were resampled in June 2022 for alkalinity and field parameters.

List A: Alkalinity, chloride, sulfate, arsenic, barium, boron, calcium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, selenium, sodium, strontium, field parameters (dissolved oxygen, redox, pH, temperature, specific conductance)

Updated by: RM, 7/11/2023

Checked by: LH, 10/9/2023

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Table 3
Monitoring Well Maintenance and Performance Reevaluation Schedule
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Code Reference:	Monitoring Calendar Year				
	2019	2020	2021	2022	2023
567 IAC 115.21(2)a. high and low water levels (biennial)	Completed		Completed		Completed
567 IAC 115.21(2)b. changes in the hydrologic setting and flow paths (biennial)	Completed		Completed		Completed
567 IAC 115.21(2)c. well depths (annual)	(1)	(1)	(1)	(1)	(1)
567 IAC 115.21(2)d. in-situ permeability tests (every 5 years)	(2)	(2)	(2)	(2)	(2)

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) In-situ permeability testing is not a requirement of IAC 567-103, and IDNR staff confirmed via email on January 25, 2021 that in-situ permeability testing is not required for wells at the Site. Therefore, in situ permeability tests are not performed every five years. Each monitoring well is inspected annually to evaluate if the monitoring well appears to be functioning as intended. Monitoring wells will be repaired or replaced if they become dry or if they fill with sediment.

Updated by: RM, 7/11/2023
Checked by: LH, 10/9/2023

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Table 4
Monitoring Well Maintenance and Performance Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Top of Casing (ft amsl)	Top of Screen (ft amsl)	Total Depth (ft)		Date of Measurement	Depth Discrepancy (ft)	Vertical Gradient
					April 10-12, 2023		
MW-1	636.67	626.50	30.17	Groundwater Level (ft)	16.31	0.73	--
				Groundwater Elevation (Ft MSL)	620.36		
				Measured Well Depth (ft)	29.44		
				Submerged screen	N		
MW-2	657.36	620.50	46.86	Groundwater Level (ft)	34.61	0.06	0.038 ft/ft Upward
				Groundwater Elevation (Ft MSL)	622.75		
				Measured Well Depth (ft)	46.80**		
				Submerged screen	Y		
MW-3	656.78	600.00	63.4^	Groundwater Level (ft)	33.21	-0.33	0.038 ft/ft Upward
				Groundwater Elevation (Ft MSL)	623.57		
				Measured Well Depth (ft)	63.73**		
				Submerged screen	Y		
MW-6	741.33	656.00	95.3	Groundwater Level (ft)	76.54	0.00	--
				Groundwater Elevation (Ft MSL)	664.79		
				Measured Well Depth (ft)*	95.30		
				Submerged screen	Y		
MW-11R	686.42	646.94	49.48	Groundwater Level (ft)	42.7	0.00	--
				Groundwater Elevation (Ft MSL)	643.72		
				Measured Well Depth (ft)*	49.48		
				Submerged screen	N		

Table 4
Monitoring Well Maintenance and Performance Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Top of Casing (ft amsl)	Top of Screen (ft amsl)	Total Depth (ft)		Date of Measurement	Depth Discrepancy (ft)	Vertical Gradient
					April 10-12, 2023		
MW-12	691.40	657.70	48.70	Groundwater Level (ft)	40.65	0.00	0.078 ft/ft Downward
				Groundwater Elevation (Ft MSL)	650.75		
				Measured Well Depth (ft)*	48.70		
				Submerged screen	N		
MW-12P	691.58	627.98	68.60	Groundwater Level (ft)	42.49	0.00	
				Groundwater Elevation (Ft MSL)	649.09		
				Measured Well Depth (ft)*	68.60		
				Submerged screen	Y		
MW-13	658.38	649.48	23.90	Groundwater Level (ft)	DRY	0.00	--
				Groundwater Elevation (Ft MSL)	N/A		
				Measured Well Depth (ft)*	23.90		
				Submerged screen	N		
MW-14	646.06	636.96	24.10	Groundwater Level (ft)	4.42	0.00	--
				Groundwater Elevation (Ft MSL)	641.64		
				Measured Well Depth (ft)*	24.10		
				Submerged screen	Y		
MW-15	656.82	640.82	31.40	Groundwater Level (ft)	DRY	0.40	--
				Groundwater Elevation (Ft MSL)	N/A		
				Measured Well Depth (ft)*	31.00		
				Submerged screen	N		
MW-16	700.26	662.18	53.08	Groundwater Level (ft)	43.33	0.35	--
				Groundwater Elevation (Ft MSL)	656.93		
				Measured Well Depth (ft)	52.73		
				Submerged screen	N		

Table 4
Monitoring Well Maintenance and Performance Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Top of Casing (ft amsl)	Top of Screen (ft amsl)	Total Depth (ft)		Date of Measurement	Depth Discrepancy (ft)	Vertical Gradient
					April 10-12, 2023		
MW-18	771.09	669.23	116.86	Groundwater Level (ft)	106.65	0.06	--
				Groundwater Elevation (Ft MSL)	664.44		
				Measured Well Depth (ft)	116.80**		
				Submerged screen	N		
MW-19	716.07	651.69	79.38	Groundwater Level (ft)	75.38	-0.32	--
				Groundwater Elevation (Ft MSL)	640.69		
				Measured Well Depth (ft)	79.70		
				Submerged screen	N		
MW-22	702.55	665.27	52.28	Groundwater Level (ft)	39.07	1.88	0.018 ft/ft Downward
				Groundwater Elevation (Ft MSL)	663.48		
				Measured Well Depth (ft)	50.40**		
				Submerged screen	N		
MW-22P	702.17	625.14	82.03	Groundwater Level (ft)	39.29	0.03	
				Groundwater Elevation (Ft MSL)	662.88		
				Measured Well Depth (ft)	82.00**		
				Submerged screen	Y		
TW-17	659.59	649.39	25.20	Groundwater Level (ft)	11.72	0.00	--
				Groundwater Elevation (Ft MSL)	647.87		
				Measured Well Depth (ft)	25.20**		
				Submerged screen	N		
TW-18	659.15	650.55	23.60	Groundwater Level (ft)	10.65	0.00	--
				Groundwater Elevation (Ft MSL)	648.5		
				Measured Well Depth (ft)*	23.60		
				Submerged screen	N		

Table 4
Monitoring Well Maintenance and Performance Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Top of Casing (ft amsl)	Top of Screen (ft amsl)	Total Depth (ft)		Date of Measurement	Depth Discrepancy (ft)	Vertical Gradient
					April 10-12, 2023		
TW-19	659.05	648.95	25.10	Groundwater Level (ft)	11.14	-0.14	--
				Groundwater Elevation (Ft MSL)	647.91		
				Measured Well Depth (ft)	25.24**		
				Submerged screen	N		

Comments:

*: Well depths measured prior to installation of dedicated pumps. To minimize turbidity and risk of cross-contamination, pumps are not pulled during regular sampling events.

**: Total well depths at select wells measured on October 11, 2023.

^: Updated following the April 2021 sampling event. A hard bottom without appreciable sediment was identified at this depth.

Updated by: RM 8/4/2023, RM 10/12/2023

Checked by: EMS 8/15/2023, NLB 10/13/2023

I:\25223070.00\Deliverables\2023 LAN AWQR\Tables\[LAN AWQR 2023 Tables.xlsx]4 - MW Main & Perform Summary

Table 5
Background and GWPS Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Interwell Background Limit (MW-6)

Constituent	Units	Samples ⁽¹⁾	Detections ⁽¹⁾	UPL	Statistical Test	GWPS	Source	Other Standards
Alkalinity	mg/L	12	12	386	PL(P)	none	--	--
Arsenic	µg/L	8	3	0.880	PL(NP)	10	MCL	--
Barium	µg/L	8	8	53.4	PL(P)	2,000	MCL	--
Boron	µg/L	8	2	110	PL(NP)	6,000	SWS	--
Calcium	mg/L	8	8	86.6	PL(P)	none	--	--
Chloride	mg/L	22	22	9.29	PL(P)	none	--	SMCL 250
Cobalt	µg/L	8	2	0.500	PL(NP)	2.1	SWS	--
Copper	µg/L	8	3	3.20	PL(NP)	1,300	SWS	SMCL 1,000
Iron	µg/L	8	1	66.0	PL(NP)	none	--	SMCL 300
Magnesium	µg/L	8	8	44,800	PL(P)	none	--	--
Manganese	µg/L	8	3	4.40	PL(NP)	300	SWS	SMCL 50
Nickel	µg/L	8	2	1.90	PL(NP)	100	SWS	--
Potassium	µg/L	8	8	1,400	PL(P)	none	--	--
Selenium	µg/L	8	3	1.40	PL(NP)	50	MCL	--
Sodium	µg/L	8	8	5,570	PL(P)	none	--	DWA 20
Strontium	µg/L	8	8	74.1	PL(P)	4,000	SWS	--
Sulfate	mg/L	25	25	34.5	PL(P)	none	--	SMCL 250

PL(NP) - Prediction Limit (Non-Parametric)
PL(P) - Prediction Limit (Parametric)
UPL - Upper Prediction Limit

MCL - Maximum Contaminant Level
SWS - Statewide Standard
GWPS = Groundwater Protection Standard

SMCL - Secondary Maximum Contaminant Level
DWA - Drinking Water Advisory

Comments:

1: Number of samples and detections for metals are based on sampling events since the sampling program was changed from filtered to unfiltered sample collection in 2016. Additional background data are included for chloride, sulfate, and alkalinity.

2. No changes to the previous statistical methods were made in this reporting period.

3. Upper Prediction Limits (UPLs) are calculated based on 2016 - 2023 data.

Updated by: RM 7/14/2023
Checked by: EMS 8/15/2023

I:\25223070.00\Deliverables\2023 LAN AWQR\Tables\[LAN AWQR 2023 Tables.xlsx]5 - Background & GWPS summary

Table 6
Summary of Well/Detected Constituent Pairs With No Immediately Preceding UPL Exceedances
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Constituent	Units	Most Recent Result	Background Level (UPL)
MW-11R	Selenium	µg/L	1.4 J	1.4
MW-12	Calcium	mg/L	76	86.6
MW-12	Chloride	mg/L	6	9.29
MW-12	Magnesium	µg/L	34000	44800
MW-12	Nickel	µg/L	3.6 J	1.9
MW-12	Strontium	µg/L	70	74.1
MW-12P	Selenium	µg/L	2.9 J	1.4
MW-14	Alkalinity	mg/L	330	386
MW-14	Barium	µg/L	40	53.4
MW-14	Calcium	mg/L	76	86.6
MW-14	Chloride	mg/L	7	9.29
MW-14	Magnesium	µg/L	36000	44800
MW-14	Potassium	µg/L	1000	1400
MW-14	Sodium	µg/L	3,300	5570
MW-14	Strontium	µg/L	58	74.1
MW-14	Sulfate	mg/L	18	34.5
TW-18	Arsenic	µg/L	0.94 J	0.88
TW-18	Magnesium	µg/L	37000	44800
TW-18	Nickel	µg/L	4.8 J	1.9
TW-18	Sulfate	mg/L	6.1	34.5

Comments:

1. This table provides a summary of detected constituents from the 2023 sampling event that did not exceed the UPL in 2023. The background levels listed are interwell prediction limits calculated using MW-6 data from 2016 through 2023.
2. Results below the limit of quantitation (J flags) are estimated values and are not compared to the UPL or GPS. They are included in this table regardless of whether the estimated value is higher or lower than the UPL.

Updated by: RM 7/14/2023

Checked by: LH, 10/9/2023

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Table 7
Summary of Ongoing and Newly Identified SSIs
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Constituent	Units	Most Recent Result	Background Standard (UPL)	Action Level or Statewide Standard
MW-11R	Alkalinity	mg/L	1100	386	none
	Arsenic	µg/L	36	0.880	10
	Barium	µg/L	520	53.4	2,000
	Boron	µg/L	280	110.0	6,000
	Calcium	mg/L	190	86.6	none
	Chloride	mg/L	16	9.3	none
	Cobalt	µg/L	7.3	0.5	2
	Iron	µg/L	55000	66.0	none
	Magnesium	µg/L	120000	44800.0	none
	Manganese	µg/L	2800	4.4	300
	Nickel	µg/L	7.1	1.9	100
	Potassium	µg/L	7800	1400.0	none
	Sodium	µg/L	26000	5570.0	none
	Strontium	µg/L	520	74.1	4,000
MW-12	Alkalinity	mg/L	400	386.0	none
	Arsenic	µg/L	22	0.880	10
	Barium	µg/L	210	53.4	2,000
	Boron	µg/L	1400	110.0	6,000
	Cobalt	µg/L	1.2	0.5	2
	Iron	µg/L	6800	66.0	none
	Manganese	µg/L	1000	4.4	300
	Potassium	µg/L	2500	1400.0	none
	Sodium	µg/L	120000	5570.0	none
	Sulfate	mg/L	210	34.5	none
MW-12P	Alkalinity	mg/L	420	386.0	none
	Barium	µg/L	91	53.4	2,000
	Boron	µg/L	2200	110.0	6,000
	Calcium	mg/L	120	86.6	none
	Chloride	mg/L	17	9.3	none
	Magnesium	µg/L	49000	44800.0	none
	Potassium	µg/L	6000	1400.0	none
	Sodium	µg/L	45000	5570.0	none
	Strontium	µg/L	140	74.1	4,000
	Sulfate	mg/L	170	34.5	none

Table 7
Summary of Ongoing and Newly Identified SSIs
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Constituent	Units	Most Recent Result	Background Standard (UPL)	Action Level or Statewide Standard
TW-18	Alkalinity	mg/L	470	386.0	none
	Barium	µg/L	180	53.4	2,000
	Boron	µg/L	190	110.0	6,000
	Calcium	mg/L	100	86.6	none
	Chloride	mg/L	54	9.3	none
	Cobalt	µg/L	2.9	0.5	2
	Iron	µg/L	3200	66.0	none
	Manganese	µg/L	2900	4.4	300
	Potassium	µg/L	1500	1400.0	none
	Sodium	µg/L	42000	5570.0	none
	Strontium	µg/L	150	74.1	4,000

Comments:

1. This table includes results for wells/constituents that exceeded the UPL in 2023.
2. Results below the limit of quantitation (J flags) are estimated values and are not compared to the UPL or GPS.

Updated by: RM, 7/10/2023

QC check by: LH, 10/9/2023

I:\25223070.00\Deliverables\2023 LAN AWQR\Tables\[LAN AWQR 2023 Tables.xlsx]7- SSI Summary

Table 8
Historic SSIs & Groundwater Protection Standard Exceedances
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Key: gray = SSI ⁽¹⁾ ; black = >GWPS		2016	2017	2018	2019	2020	2021	2022	2023
Well	Constituent								
MW-11R	Alkalinity								
	Arsenic								
	Barium								
	Boron								
	Calcium								
	Chloride								
	Cobalt								
	Iron								
	Magnesium								
	Manganese								
	Nickel								
	Potassium								
	Sodium								
	Strontium								
MW-12	Alkalinity								
	Arsenic								
	Barium								
	Boron								
	Cobalt								
	Iron								
	Manganese								
	Nickel								
	Potassium								
	Sodium								
	Strontium								
	Sulfate								
MW-12P	Alkalinity								
	Barium								
	Boron								
	Calcium								
	Chloride								
	Iron								
	Magnesium								
	Manganese								
	Potassium								
	Sodium								
	Strontium								
	Sulfate								

Table 8
Historic SSIs & Groundwater Protection Standard Exceedances
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Key: gray = SSI ⁽¹⁾ ; black = >GWPS		2016	2017	2018	2019	2020	2021	2022	2023
Well	Constituent								
MW-13	Boron								Well Dry
	Calcium								
	Chloride								
	Cobalt								
	Iron								
	Manganese								
	Potassium								
	Selenium								
	Sodium								
	Strontium								
	Sulfate								
MW-14	Chloride								
	Iron								
	Manganese								
	Sodium								
	Strontium								
	Sulfate								
MW-15	Barium								Well Dry
	Boron								
	Chloride								
	Manganese								
	Potassium								
	Sodium								
	Strontium								
	Sulfate								
TW-18	Alkalinity	Not sampled							
	Barium								
	Boron								
	Calcium								
	Chloride								
	Cobalt								
	Iron								
	Manganese								
	Potassium								
	Sodium								
	Strontium								
	Sulfate								

Table 8
Historic SSIs & Groundwater Protection Standard Exceedances
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Key: gray = SSI ⁽¹⁾ ; black = >GWPS		2016	2017	2018	2019	2020	2021	2022	2023
Well	Constituent								

Comments:

1: UPLs were calculated annually beginning in 2019 when at least four sampling events with unfiltered (total) data. UPLs are only applied to 2019 through 2023 results in this table.

Updated by: RM 8/4/2023

Checked by: LH 10/9/2023

I:\25223070.00\Deliverables\2023 LAN AWQR\Tables\[LAN AWQR 2023 Tables.xlsx]8 - Historic SSI & GWPS

Table 9
Historic Prediction Limits and Groundwater Protection Standards
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Constituent	Units	UPL					GWPS				
		2019	2020	2021	2022	2023	2019	2020	2021	2022	2023
Alkalinity	mg/L	398	390	382	379	386	none	none	none	none	none
Arsenic	µg/L	0.72	1.99	0.88	0.88	0.88	10	10	10	10	10
Barium	µg/L	56.0	55.2	54.0	53.2	53.4	2,000	2,000	2,000	2,000	2,000
Boron	µg/L	55	110	55.0	55.0	110.0	6,000	6,000	6,000	6,000	6,000
Calcium	mg/L	75.7	82.2	79.1	84.6	86.6	none	none	none	none	none
Chloride	mg/L	9.42	9.54	9.44	9.38	9.29	none	none	none	none	none
Cobalt	µg/L	0.25	0.50	0.50	0.50	0.50	2.1	2.1	2.1	2.1	2.1
Copper	µg/L	2.73	7.69	3.20	3.20	3.20	1,300	1,300	1,300	1,300	1,300
Iron	µg/L	33.0	66.0	66.0	66.0	66.0	none	none	none	none	none
Magnesium	µg/L	47,000	49,300	45,600	43,500	44,800	none	none	none	none	none
Manganese	µg/L	5.06	4.55	2.20	2.20	4.40	300	300	300	300	300
Nickel	µg/L	0.85	1.90	1.90	1.90	1.90	100	100	100	100	100
Potassium	µg/L	1,400	1,530	1,380	1,410	1,400	none	none	none	none	none
Selenium	µg/L	1.11	2.28	1.00	1.00	1.40	50	50	50	50	50
Sodium	µg/L	5,570	5,880	5,620	5,680	5,570	none	none	none	none	none
Strontium	µg/L	74.8	84.3	78.9	76.2	74.1	4,000	4,000	4,000	4,000	4,000
Sulfate	mg/L	35.4	35.2	34.9	34.6	34.5	none	none	none	none	none

Updated by: RM 7/14/2023
Checked by: LH 10/9/2023

I:\25223070.00\Deliverables\2023 LAN AWQR\Tables\[LAN AWQR 2023 Tables.xlsx]9 - UPL History and Graphs

Table 10
Groundwater Quality Trend Summary
2023 Annual Water Quality Report
IPL - Lansing Generating Station
Permit No. 03-SDP-05-01P

Well	Current GWPS Exceedances	Trend
MW-11R	Arsenic	No significant trend
	Cobalt	No significant trend
	Manganese	No significant trend
MW-12	Arsenic	No significant trend
	Manganese	No significant trend
MW-12P	Arsenic	No significant trend
TW-18	Cobalt	No significant trend
	Manganese	No significant trend

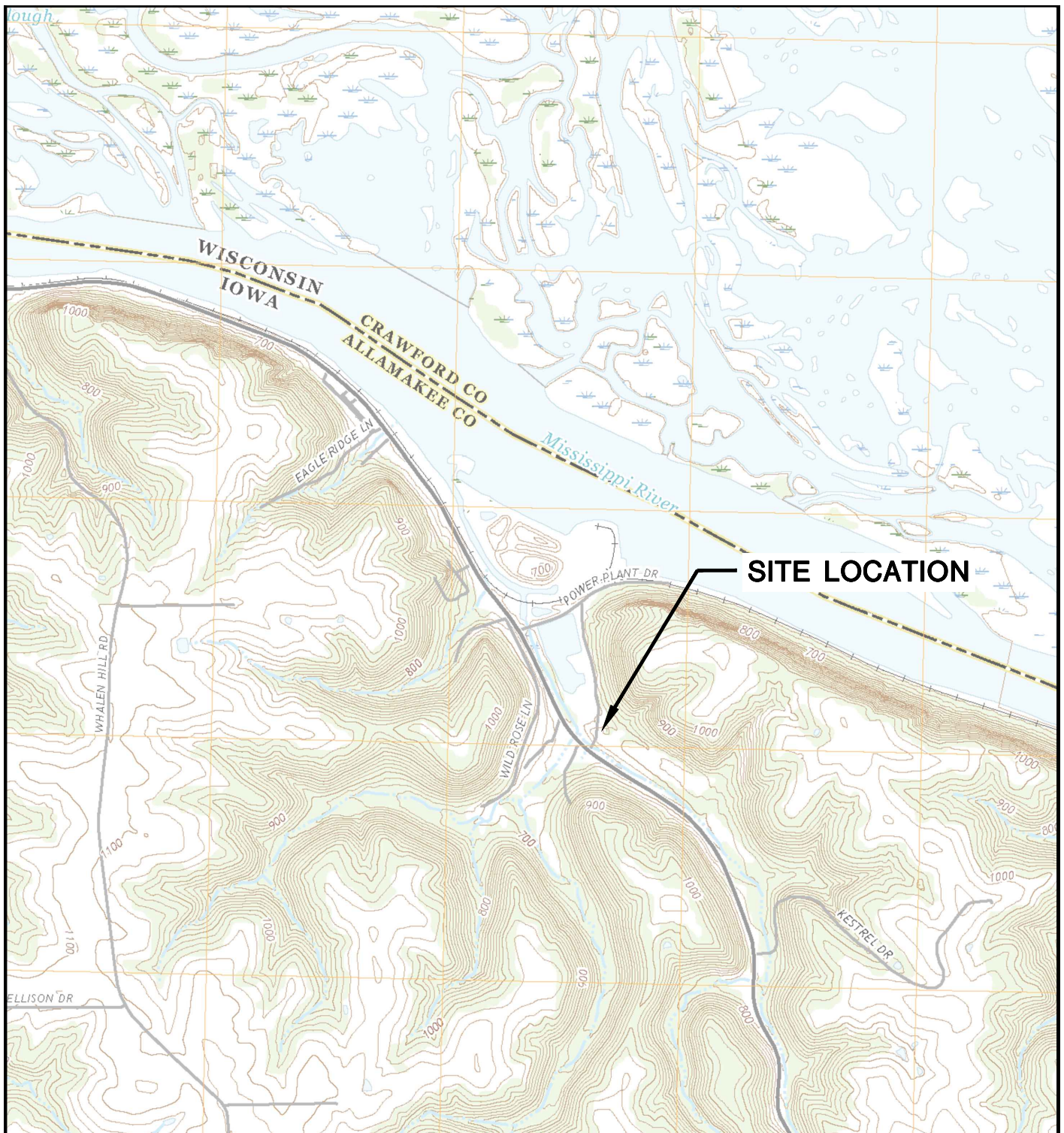
Comments:

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

Updated by: RM 7/14/2023
Checked by: EMS 8/15/2023

Figures

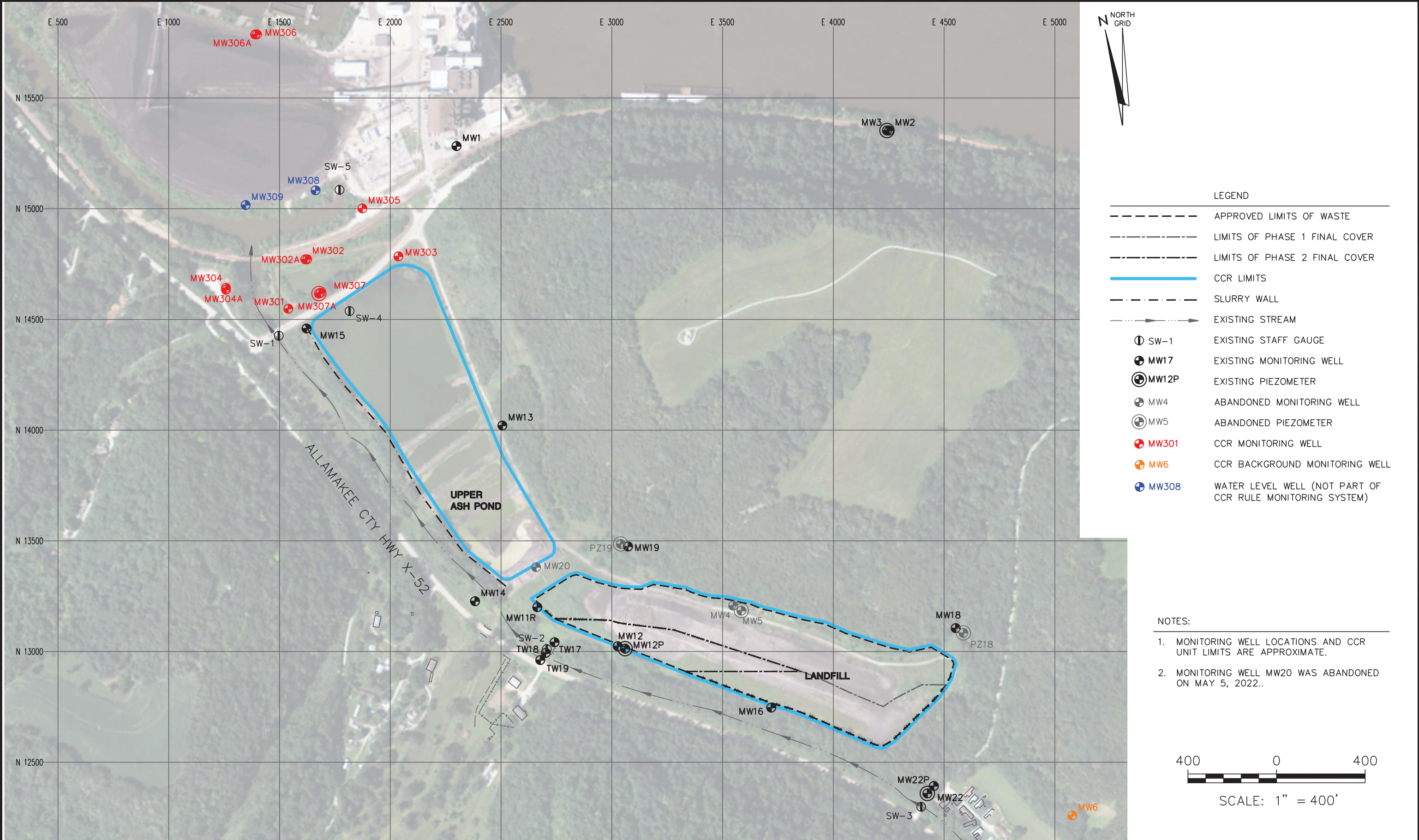
- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map, April 10-11, 2023



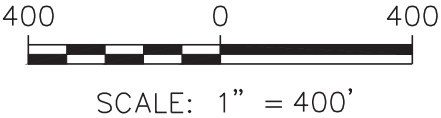
LANSING QUADRANGLE
IOWA-ALLAMAKEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



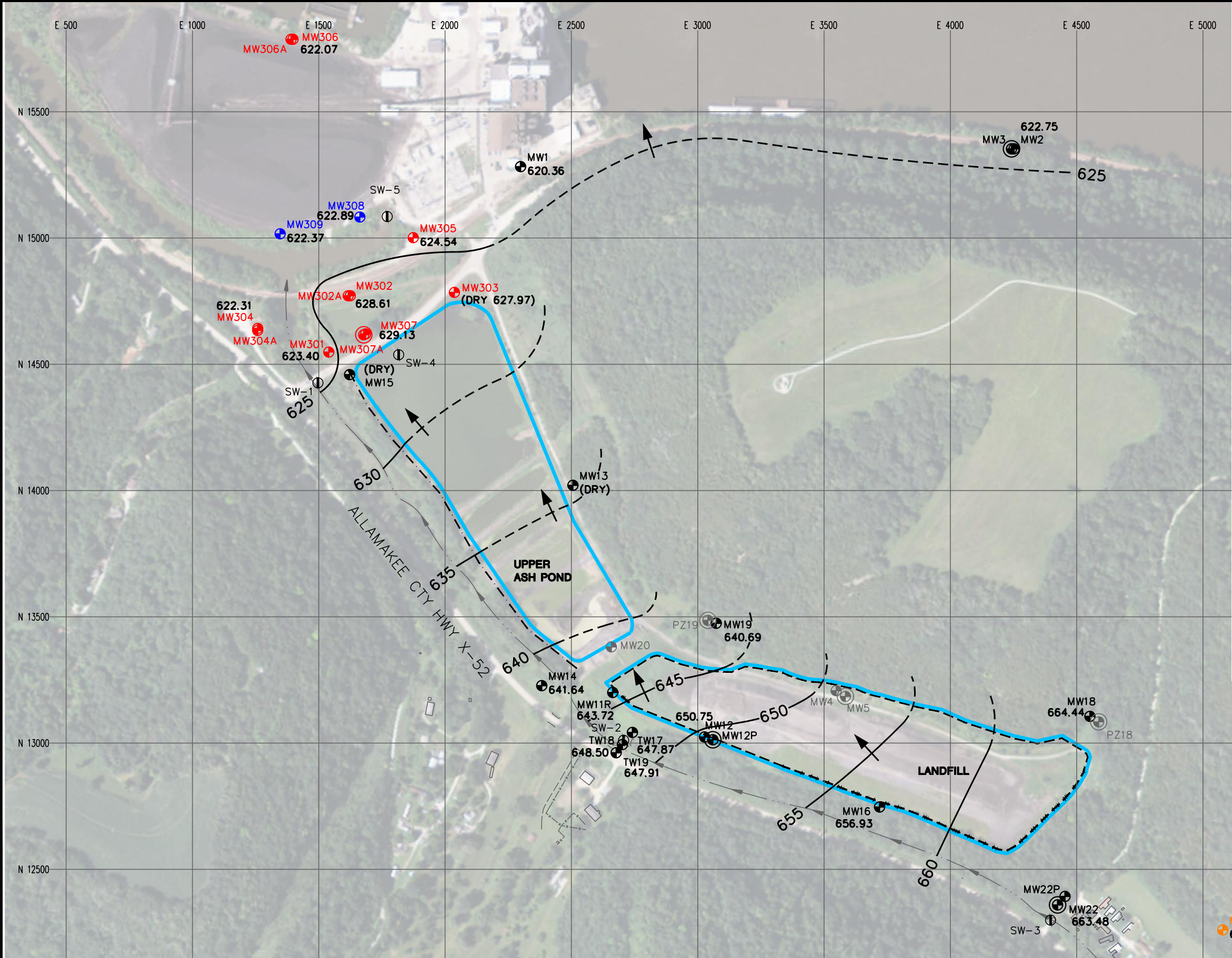
CLIENT INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	SITE ALLIANT ENERGY LANSING GENERATING STATION LANSING, IOWA	SITE LOCATION MAP	
PROJECT NO. 25219070.00	DRAWN BY: BSS	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN: 11/27/2019	CHECKED BY: MDB		1
REVISED: 03/12/2020	APPROVED BY: JR, 8/9/2022		



- NOTES:
1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
 2. MONITORING WELL MW20 WAS ABANDONED ON MAY 5, 2022..



PROJECT NO. 25222070.00		DRAWN BY: KP		ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	SITE	ALLIANT ENERGY LANSING POWER STATION LANSING, IOWA	SITE PLAN AND MONITORING WELL LOCATIONS	FIGURE
DRAWN: 05/26/2021		CHECKED BY: JR									2
REVISED: 01/27/2023		APPROVED BY: TK 01/30/2023									



LEGEND

- APPROVED LIMITS OF WASTE
- - - SLURRY WALL
- > EXISTING STREAM
- ① SW-1 EXISTING STAFF GAUGE
- ⊕ MW17 EXISTING MONITORING WELL
- ⊕ MW12P EXISTING PIEZOMETER
- ⊕ MW4 ABANDONED MONITORING WELL
- ⊕ MW5 ABANDONED PIEZOMETER
- ⊕ MW301 CCR MONITORING WELL
- ⊕ MW6 CCR BACKGROUND MONITORING WELL
- ⊕ MW308 WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- CCR UNITS
- (642.81) SURFACE WATER ELEVATION
- (NM) NOT MEASURED
- 666.58 WATER TABLE ELEVATION
- WATER TABLE CONTOUR (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

- MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
- SEE FIGURE 2 FOR ADDITIONAL LEGEND ITEMS AND NOTES.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25223070.00	DRAWN BY:	KP	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	SITE	ALLIANT ENERGY LANSING POWER STATION LANSING, IOWA	WATER TABLE MAP APRIL 2023	FIGURE
DRAWN:	06/28/2023	CHECKED BY:	NLB								3
REVISED:	10/31/2023	APPROVED BY:	TK 11/10/223								



Appendix A

Groundwater Sampling Field Sheets



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: MW-6 Weather: 62F Partly Cloudy

Date: 4/11/2023 Sampler Name: Bri Salome

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 85.33

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 741.33 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	76.54	76.70	76.70
Water Elevation (ft. MSL):	620.36	620.22	620.22

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	4/11/23 920	4/11/23 1030

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time	950	955	1000	1005	1010	1015	4/11 1020
Depth to Water (ft)	76.62	76.70	76.93	76.71	76.70	76.70	76.70
Volume Purged (L)	18	20.25	22.5	24.75	27.0	29.25	31.5
Temp (°C)	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Sp. Cond (umhos/cm)	594	593.7	594.7	594.6	596.3	596.3	595.6
pH	6.81	6.89	6.98	7.04	7.09	7.12	7.15
DO (mg/l)	8.21	8.20	8.26	8.32	8.42	8.35	8.38
ORP (mV)	154.5	152.5	149.2	146.8	145.0	142.9	141.4
Turbidity (NTU)	1.86	0.22	3.15	1.26	0.54	1.57	0.97

Equipment Depth: 5' off bottom Flow Rate: 0.45 L/min Volume Removed: 31.5 L Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: --



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: MW-11R Weather: 70F Sunny

Date: 4/10/2023 Sampler Name: Bri Salome

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 39.48

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 686.42 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	42.7	below top of pump	below top of pump
Water Elevation (ft. MSL):	643.72	--	--

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	4/10/23 1430	4/10/23 1600

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time	1525	1530	1535	1540	1545	1550	4/10 1555
Depth to Water (ft)	below top of	pump	--	--	--	--	--
Volume Purged (L)	24	26	28	30	32	34	36
Temp (°C)	12.3	12.7	12.6	12.5	12.6	12.3	12.5
Sp. Cond (umhos/cm)	1731	1730	1730	1728	1730	1730	1728
pH	6.88	6.89	6.90	6.90	6.91	6.92	6.90
DO (mg/l)	0.08	0.08	0.09	0.10	0.10	0.10	0.10
ORP (mV)	51.2	43.0	37.2	33.4	29.2	25.8	21.6
Turbidity (NTU)	3.25	4.22	3.07	1.35	3.52	1.68	3.88

Equipment Depth: 5' off bottom Flow Rate: 0.4 L Volume Removed: 36 L Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: --



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: MW-12 Weather: 77F Sunny

Date: 4/11/2023 Sampler Name: Bri Salome

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 33.70

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 691.40 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	40.65	below top of pump	below top of pump
Water Elevation (ft. MSL):	650.75	--	--

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	4/11 1400	4/11 1430

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time					1410	1415	4/11 1420
Depth to Water (ft)					< top pump	< top pump	< top pump
Volume Purged (L)					8	12	16
Temp (°C)					11.3	11.3	11.4
Sp. Cond (umhos/cm)					1037	1031	1030
pH					7.13	7.15	7.17
DO (mg/l)					0.05	0.07	0.07
ORP (mV)					148.0	145.5	140.3
Turbidity (NTU)					3.75	3.56	4.75

Equipment Depth: 5' off bottom Flow Rate: 0.8 L/min Volume Removed: 24 L Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: --



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: MW-12P Weather: 74F Sunny

Date: 4/11/2023 Sampler Name: Bri Salome

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 63.6

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 691.58 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	42.49	42.54	42.54
Water Elevation (ft. MSL):	649.09	649.04	649.04

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	4/11/2023 1435	4/11/2023 1510

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time				1445	1450	1455	4/11 1500
Depth to Water (ft)				42.54	42.54	42.54	42.54
Volume Purged (L)				7	10.5	14	17.5
Temp (°C)				11.3	11.3	11.3	11.3
Sp. Cond (umhos/cm)				984	982	984	--
pH				7.12	7.12	7.13	7.13
DO (mg/l)				2.00	1.91	1.95	1.96
ORP (mV)				133.2	132.3	131.8	131.4
Turbidity (NTU)				2.60	3.82	3.14	2.95

Equipment Depth: 2.5' off btm Flow Rate: 0.7 L Volume Removed: 24.5 Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: Sampler did not record final Spec Cond



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: MW-14 Weather: 79F Sunny

Date: 4/11/2023 Sampler Name: Ethan Schaefer

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 9.10

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 646.06 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	4.42	4.75	4.75
Water Elevation (ft. MSL):	641.64	641.31	641.31

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	4/11/23 1435	4/11/23 1516

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time			1450	1455	1500	1505	4/11 1510
Depth to Water (ft)			4.75	4.75	4.75	4.75	4.75
Volume Purged (L)			11.25	15	18.75	22.5	26.25
Temp (°C)			9.2	9.2	9.2	9.2	9.1
Sp. Cond (umhos/cm)			410.7	411.1	410.1	410.1	409.8
pH			7.74	7.73	7.72	7.72	7.77
DO (mg/l)			6.28	6.03	6.16	6.24	6.00
ORP (mV)			58.9	52.9	65.1	67.0	68.9
Turbidity (NTU)			2.37	0.00	0.52	0.90	1.28

Equipment Depth: 5' off bottom Flow Rate: 0.75 L Volume Removed: 30.75 Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: --



Groundwater Sampling Field Sheet

Disposal Site Name: IPL - Lansing Generating Station Permit No.: 03-SDP-05-01P

Well/Piezometer: TW-18 Weather: 66F Partly Cloudy

Date: 4/12/2023 Sampler Name: Bri Salome

Monitoring Well Details

Construction Data

Borehole Diameter (in): 8.25" Depth to Top of Screen (ft): 8.60

Casing Diameter (in): 2.01 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 659.15 Ground Surface Elevation (ft. MSL):

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	10.65	10.83	10.83
Water Elevation (ft. MSL):	648.50		

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	4/12/23 1050	4/12/2023 1300

Well Conditions Commentary: --

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify):

Equipment Name & Description: Well Wizard

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify):

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: N/A. Dedicated pump.

Field Analysis

							Final Reading
Date/Time	1220	1225	1230	1235	1240	1245	4/12 1250
Depth to Water (ft)	10.83	10.83	10.83	10.83	10.83	10.83	10.83
Volume Purged (L)	55	57	60	63	66	69	72
Temp (°C)	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Sp. Cond (umhos/cm)	886	885	885	886	887	888	887
pH	7.05	7.05	7.05	7.05	7.05	7.07	7.06
DO (mg/l)	0.17	0.18	0.18	0.17	0.17	0.18	0.17
ORP (mV)	108.5	107.4	107.1	106.7	106.6	104	103.6
Turbidity (NTU)	6.19	10.65	9.63	10.75	4.91	3.50	4.29

Equipment Depth: 5' off bottom Flow Rate: 0.6 L Volume Removed: 78 L Volume Sampled: 1L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: --



Appendix B

Laboratory Analytical Report

ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718
Generated 5/12/2023 9:47:11 AM Revision 1

JOB DESCRIPTION

Lansing Generating Station - 25223070

JOB NUMBER

310-253485-1

Eurofins Cedar Falls

Job Notes

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

Authorization



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Revision 1

Authorized for release by
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Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Sample Summary	5
Detection Summary	6
Client Sample Results	9
Definitions	16
QC Sample Results	17
QC Association	20
Chronicle	22
Certification Summary	24
Method Summary	25
Chain of Custody	26
Receipt Checklists	33
Field Data Sheets	34



Case Narrative

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Job ID: 310-253485-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-253485-1

Comments

No additional comments.

Revision

The report being provided is a revision of the original report sent on 5/2/2023. The report (revision 1) is being revised due to: Updated sample IDs and field data..

Receipt

The samples were received on 4/13/2023 9:15 AM. 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 -0.1° C, 0.8° C and 2.1° C.

HPLC/IC

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-11R (310-253485-2). Elevated reporting limits (RLs) are provided.

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

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: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-253485-1	MW-6	Water	04/11/23 10:20	04/13/23 09:15
310-253485-2	MW-11R	Water	04/10/23 16:00	04/13/23 09:15
310-253485-3	MW-12P	Water	04/11/23 15:05	04/13/23 09:15
310-253485-4	MW-12	Water	04/11/23 14:25	04/13/23 09:15
310-253485-5	MW-14	Water	04/11/23 15:15	04/13/23 09:15
310-253485-6	TW-18	Water	04/11/23 13:00	04/13/23 09:15
310-253485-7	FIELD BLANK	Water	04/11/23 14:40	04/13/23 09:15

Detection Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-6

Lab Sample ID: 310-253485-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.6		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	20		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	49		2.0	0.64	ug/L	1		6020B	Total/NA
Calcium	79000		500	190	ug/L	1		6020B	Total/NA
Magnesium	40000		500	150	ug/L	1		6020B	Total/NA
Potassium	1200		500	150	ug/L	1		6020B	Total/NA
Sodium	4400		1000	460	ug/L	1		6020B	Total/NA
Strontium	60		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	360		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	360		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	664.79				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	141.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	8.38				mg/L	1		Field Sampling	Total/NA
pH, Field	7.15				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	595.6				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	9.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.97				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-11R

Lab Sample ID: 310-253485-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16		5.0	2.3	mg/L	5		9056A	Total/NA
Arsenic	36		2.0	0.53	ug/L	1		6020B	Total/NA
Barium	520		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	280		100	76	ug/L	1		6020B	Total/NA
Calcium	190000		500	190	ug/L	1		6020B	Total/NA
Cobalt	7.3		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	55000		100	36	ug/L	1		6020B	Total/NA
Magnesium	120000		2000	600	ug/L	4		6020B	Total/NA
Manganese	2800		10	3.6	ug/L	1		6020B	Total/NA
Nickel	7.1		5.0	1.9	ug/L	1		6020B	Total/NA
Potassium	7800		500	150	ug/L	1		6020B	Total/NA
Selenium	1.4	J	5.0	1.4	ug/L	1		6020B	Total/NA
Sodium	26000		1000	460	ug/L	1		6020B	Total/NA
Strontium	520		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	1100		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	1100		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	643.72				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	21.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.10				mg/L	1		Field Sampling	Total/NA
pH, Field	6.90				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1728				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.5				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	3.88				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-12P

Lab Sample ID: 310-253485-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	170		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	91		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	2200		100	76	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

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Detection Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-12P (Continued)

Lab Sample ID: 310-253485-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	120000		500	190	ug/L	1		6020B	Total/NA
Magnesium	49000		500	150	ug/L	1		6020B	Total/NA
Potassium	6000		500	150	ug/L	1		6020B	Total/NA
Selenium	2.9	J	5.0	1.4	ug/L	1		6020B	Total/NA
Sodium	45000		1000	460	ug/L	1		6020B	Total/NA
Strontium	140		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	420		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	420		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	649.09				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	131.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.96				mg/L	1		Field Sampling	Total/NA
pH, Field	7.13				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	980				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.3				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	2.95				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-12

Lab Sample ID: 310-253485-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.0		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	210		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	22		2.0	0.53	ug/L	1		6020B	Total/NA
Barium	210		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	1400		100	76	ug/L	1		6020B	Total/NA
Calcium	76000		500	190	ug/L	1		6020B	Total/NA
Cobalt	1.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	6800		100	36	ug/L	1		6020B	Total/NA
Magnesium	34000		500	150	ug/L	1		6020B	Total/NA
Manganese	1000		10	3.6	ug/L	1		6020B	Total/NA
Nickel	3.6	J	5.0	1.9	ug/L	1		6020B	Total/NA
Potassium	2500		500	150	ug/L	1		6020B	Total/NA
Sodium	120000		1000	460	ug/L	1		6020B	Total/NA
Strontium	70		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	400		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	400		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	650.75				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	140.3				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.07				mg/L	1		Field Sampling	Total/NA
pH, Field	7.17				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1030				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	4.75				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-14

Lab Sample ID: 310-253485-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.0		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	18		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	40		2.0	0.64	ug/L	1		6020B	Total/NA
Calcium	76000		500	190	ug/L	1		6020B	Total/NA
Magnesium	36000		500	150	ug/L	1		6020B	Total/NA
Potassium	1000		500	150	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Detection Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-14 (Continued)

Lab Sample ID: 310-253485-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	3300		1000	460	ug/L	1		6020B	Total/NA
Strontium	58		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	330		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	330		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	641.64				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	68.9				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	6.00				mg/L	1		Field Sampling	Total/NA
pH, Field	7.77				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	409.8				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	9.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.28				NTU	1		Field Sampling	Total/NA

Client Sample ID: TW-18

Lab Sample ID: 310-253485-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	54		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	6.1		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.94	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	180		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	190		100	76	ug/L	1		6020B	Total/NA
Calcium	100000		500	190	ug/L	1		6020B	Total/NA
Cobalt	2.9		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3200		100	36	ug/L	1		6020B	Total/NA
Magnesium	37000		500	150	ug/L	1		6020B	Total/NA
Manganese	2900		10	3.6	ug/L	1		6020B	Total/NA
Nickel	4.8	J	5.0	1.9	ug/L	1		6020B	Total/NA
Potassium	1500		500	150	ug/L	1		6020B	Total/NA
Sodium	42000		1000	460	ug/L	1		6020B	Total/NA
Strontium	150		1.0	0.53	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	470		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	470		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Ground Water Elevation	648.50				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	103.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.17				mg/L	1		Field Sampling	Total/NA
pH, Field	7.06				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	887				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	6.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	4.29				NTU	1		Field Sampling	Total/NA

Client Sample ID: FIELD BLANK

Lab Sample ID: 310-253485-7

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-6

Lab Sample ID: 310-253485-1

Date Collected: 04/11/23 10:20

Matrix: Water

Date Received: 04/13/23 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.6		5.0	2.3	mg/L			04/20/23 14:18	5
Sulfate	20		5.0	2.1	mg/L			04/20/23 14:18	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		04/14/23 08:45	04/21/23 01:12	1
Barium	49		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:12	1
Boron	<76		100	76	ug/L		04/14/23 08:45	04/21/23 01:12	1
Calcium	79000		500	190	ug/L		04/14/23 08:45	04/21/23 01:12	1
Cobalt	<0.17		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:12	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:12	1
Iron	<36		100	36	ug/L		04/14/23 08:45	04/21/23 01:12	1
Magnesium	40000		500	150	ug/L		04/14/23 08:45	04/21/23 01:12	1
Manganese	<3.6		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:12	1
Nickel	<1.9		5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:12	1
Potassium	1200		500	150	ug/L		04/14/23 08:45	04/21/23 01:12	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:12	1
Sodium	4400		1000	460	ug/L		04/14/23 08:45	04/21/23 01:12	1
Strontium	60		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	360		5.0	2.5	mg/L			04/15/23 01:06	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 01:06	1
Total Alkalinity as CaCO3 (SM 2320B)	360		5.0	2.5	mg/L			04/15/23 01:06	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	664.79				ft			04/11/23 10:20	1
Oxidation Reduction Potential	141.4				millivolts			04/11/23 10:20	1
Oxygen, Dissolved, Client Supplied	8.38				mg/L			04/11/23 10:20	1
pH, Field	7.15				SU			04/11/23 10:20	1
Specific Conductance, Field	595.6				umhos/cm			04/11/23 10:20	1
Temperature, Field	9.9				Degrees C			04/11/23 10:20	1
Turbidity, Field	0.97				NTU			04/11/23 10:20	1

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Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-11R

Lab Sample ID: 310-253485-2

Date Collected: 04/10/23 16:00

Matrix: Water

Date Received: 04/13/23 09:15

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			04/20/23 14:33	5
Sulfate	<2.1		5.0	2.1	mg/L			04/20/23 14:33	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	36		2.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:15	1
Barium	520		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:15	1
Boron	280		100	76	ug/L		04/14/23 08:45	04/21/23 01:15	1
Calcium	190000		500	190	ug/L		04/14/23 08:45	04/21/23 01:15	1
Cobalt	7.3		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:15	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:15	1
Iron	55000		100	36	ug/L		04/14/23 08:45	04/21/23 01:15	1
Magnesium	120000		2000	600	ug/L		04/14/23 08:45	04/23/23 15:53	4
Manganese	2800		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:15	1
Nickel	7.1		5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:15	1
Potassium	7800		500	150	ug/L		04/14/23 08:45	04/21/23 01:15	1
Selenium	1.4 J		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:15	1
Sodium	26000		1000	460	ug/L		04/14/23 08:45	04/21/23 01:15	1
Strontium	520		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	1100		5.0	2.5	mg/L			04/15/23 01:17	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 01:17	1
Total Alkalinity as CaCO3 (SM 2320B)	1100		5.0	2.5	mg/L			04/15/23 01:17	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	643.72				ft			04/10/23 16:00	1
Oxidation Reduction Potential	21.6				millivolts			04/10/23 16:00	1
Oxygen, Dissolved, Client Supplied	0.10				mg/L			04/10/23 16:00	1
pH, Field	6.90				SU			04/10/23 16:00	1
Specific Conductance, Field	1728				umhos/cm			04/10/23 16:00	1
Temperature, Field	12.5				Degrees C			04/10/23 16:00	1
Turbidity, Field	3.88				NTU			04/10/23 16:00	1

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Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-12P

Lab Sample ID: 310-253485-3

Date Collected: 04/11/23 15:05

Matrix: Water

Date Received: 04/13/23 09:15

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			04/20/23 14:49	5
Sulfate	170		5.0	2.1	mg/L			04/20/23 14:49	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		04/14/23 08:45	04/21/23 01:18	1
Barium	91		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:18	1
Boron	2200		100	76	ug/L		04/14/23 08:45	04/21/23 01:18	1
Calcium	120000		500	190	ug/L		04/14/23 08:45	04/21/23 01:18	1
Cobalt	<0.17		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:18	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:18	1
Iron	<36		100	36	ug/L		04/14/23 08:45	04/21/23 01:18	1
Magnesium	49000		500	150	ug/L		04/14/23 08:45	04/21/23 01:18	1
Manganese	<3.6		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:18	1
Nickel	<1.9		5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:18	1
Potassium	6000		500	150	ug/L		04/14/23 08:45	04/21/23 01:18	1
Selenium	2.9 J		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:18	1
Sodium	45000		1000	460	ug/L		04/14/23 08:45	04/21/23 01:18	1
Strontium	140		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	420		5.0	2.5	mg/L			04/15/23 01:34	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 01:34	1
Total Alkalinity as CaCO3 (SM 2320B)	420		5.0	2.5	mg/L			04/15/23 01:34	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	649.09				ft			04/11/23 15:05	1
Oxidation Reduction Potential	131.4				millivolts			04/11/23 15:05	1
Oxygen, Dissolved, Client Supplied	1.96				mg/L			04/11/23 15:05	1
pH, Field	7.13				SU			04/11/23 15:05	1
Specific Conductance, Field	980				umhos/cm			04/11/23 15:05	1
Temperature, Field	11.3				Degrees C			04/11/23 15:05	1
Turbidity, Field	2.95				NTU			04/11/23 15:05	1

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Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-12

Lab Sample ID: 310-253485-4

Date Collected: 04/11/23 14:25

Matrix: Water

Date Received: 04/13/23 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.0		5.0	2.3	mg/L			04/20/23 15:05	5
Sulfate	210		5.0	2.1	mg/L			04/20/23 15:05	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22		2.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:21	1
Barium	210		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:21	1
Boron	1400		100	76	ug/L		04/14/23 08:45	04/21/23 01:21	1
Calcium	76000		500	190	ug/L		04/14/23 08:45	04/21/23 01:21	1
Cobalt	1.2		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:21	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:21	1
Iron	6800		100	36	ug/L		04/14/23 08:45	04/21/23 01:21	1
Magnesium	34000		500	150	ug/L		04/14/23 08:45	04/21/23 01:21	1
Manganese	1000		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:21	1
Nickel	3.6	J	5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:21	1
Potassium	2500		500	150	ug/L		04/14/23 08:45	04/21/23 01:21	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:21	1
Sodium	120000		1000	460	ug/L		04/14/23 08:45	04/21/23 01:21	1
Strontium	70		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	400		5.0	2.5	mg/L			04/15/23 01:46	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 01:46	1
Total Alkalinity as CaCO3 (SM 2320B)	400		5.0	2.5	mg/L			04/15/23 01:46	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	650.75				ft			04/11/23 14:25	1
Oxidation Reduction Potential	140.3				millivolts			04/11/23 14:25	1
Oxygen, Dissolved, Client Supplied	0.07				mg/L			04/11/23 14:25	1
pH, Field	7.17				SU			04/11/23 14:25	1
Specific Conductance, Field	1030				umhos/cm			04/11/23 14:25	1
Temperature, Field	11.4				Degrees C			04/11/23 14:25	1
Turbidity, Field	4.75				NTU			04/11/23 14:25	1

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Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-14

Date Collected: 04/11/23 15:15

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.0		5.0	2.3	mg/L			04/20/23 15:20	5
Sulfate	18		5.0	2.1	mg/L			04/20/23 15:20	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		04/14/23 08:45	04/21/23 01:39	1
Barium	40		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:39	1
Boron	<76		100	76	ug/L		04/14/23 08:45	04/21/23 01:39	1
Calcium	76000		500	190	ug/L		04/14/23 08:45	04/21/23 01:39	1
Cobalt	<0.17		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:39	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:39	1
Iron	<36		100	36	ug/L		04/14/23 08:45	04/21/23 01:39	1
Magnesium	36000		500	150	ug/L		04/14/23 08:45	04/21/23 01:39	1
Manganese	<3.6		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:39	1
Nickel	<1.9		5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:39	1
Potassium	1000		500	150	ug/L		04/14/23 08:45	04/21/23 01:39	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:39	1
Sodium	3300		1000	460	ug/L		04/14/23 08:45	04/21/23 01:39	1
Strontium	58		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	330		5.0	2.5	mg/L			04/15/23 01:57	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 01:57	1
Total Alkalinity as CaCO3 (SM 2320B)	330		5.0	2.5	mg/L			04/15/23 01:57	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	641.64				ft			04/11/23 15:13	1
Oxidation Reduction Potential	68.9				millivolts			04/11/23 15:13	1
Oxygen, Dissolved, Client Supplied	6.00				mg/L			04/11/23 15:13	1
pH, Field	7.77				SU			04/11/23 15:13	1
Specific Conductance, Field	409.8				umhos/cm			04/11/23 15:13	1
Temperature, Field	9.1				Degrees C			04/11/23 15:13	1
Turbidity, Field	1.28				NTU			04/11/23 15:13	1

Eurofins Cedar Falls

Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: TW-18

Lab Sample ID: 310-253485-6

Date Collected: 04/11/23 13:00

Matrix: Water

Date Received: 04/13/23 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	54		5.0	2.3	mg/L			04/20/23 15:36	5
Sulfate	6.1		5.0	2.1	mg/L			04/20/23 15:36	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.94	J	2.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:42	1
Barium	180		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:42	1
Boron	190		100	76	ug/L		04/14/23 08:45	04/21/23 01:42	1
Calcium	100000		500	190	ug/L		04/14/23 08:45	04/21/23 01:42	1
Cobalt	2.9		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:42	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:42	1
Iron	3200		100	36	ug/L		04/14/23 08:45	04/21/23 01:42	1
Magnesium	37000		500	150	ug/L		04/14/23 08:45	04/21/23 01:42	1
Manganese	2900		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:42	1
Nickel	4.8	J	5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:42	1
Potassium	1500		500	150	ug/L		04/14/23 08:45	04/21/23 01:42	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:42	1
Sodium	42000		1000	460	ug/L		04/14/23 08:45	04/21/23 01:42	1
Strontium	150		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	470		5.0	2.5	mg/L			04/15/23 02:08	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/15/23 02:08	1
Total Alkalinity as CaCO3 (SM 2320B)	470		5.0	2.5	mg/L			04/15/23 02:08	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	648.50				ft			04/11/23 13:00	1
Oxidation Reduction Potential	103.6				millivolts			04/11/23 13:00	1
Oxygen, Dissolved, Client Supplied	0.17				mg/L			04/11/23 13:00	1
pH, Field	7.06				SU			04/11/23 13:00	1
Specific Conductance, Field	887				umhos/cm			04/11/23 13:00	1
Temperature, Field	6.1				Degrees C			04/11/23 13:00	1
Turbidity, Field	4.29				NTU			04/11/23 13:00	1

Eurofins Cedar Falls

Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: FIELD BLANK

Lab Sample ID: 310-253485-7

Date Collected: 04/11/23 14:40

Matrix: Water

Date Received: 04/13/23 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/20/23 15:51	1
Sulfate	<0.42		1.0	0.42	mg/L			04/20/23 15:51	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		04/14/23 08:45	04/21/23 01:45	1
Barium	<0.64		2.0	0.64	ug/L		04/14/23 08:45	04/21/23 01:45	1
Boron	<76		100	76	ug/L		04/14/23 08:45	04/21/23 01:45	1
Calcium	<0.19		0.50	0.19	mg/L		04/14/23 08:45	04/21/23 01:45	1
Cobalt	<0.17		0.50	0.17	ug/L		04/14/23 08:45	04/21/23 01:45	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/21/23 01:45	1
Iron	<36		100	36	ug/L		04/14/23 08:45	04/21/23 01:45	1
Magnesium	<150		500	150	ug/L		04/14/23 08:45	04/21/23 01:45	1
Manganese	<3.6		10	3.6	ug/L		04/14/23 08:45	04/21/23 01:45	1
Nickel	<1.9		5.0	1.9	ug/L		04/14/23 08:45	04/21/23 01:45	1
Potassium	<150		500	150	ug/L		04/14/23 08:45	04/21/23 01:45	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/21/23 01:45	1
Sodium	<460		1000	460	ug/L		04/14/23 08:45	04/21/23 01:45	1
Strontium	<0.53		1.0	0.53	ug/L		04/14/23 08:45	04/21/23 01:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/19/23 19:37	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/19/23 19:37	1
Total Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/19/23 19:37	1

Definitions/Glossary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Qualifiers

Metals

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
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.
α	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: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-385595/3

Matrix: Water

Analysis Batch: 385595

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			04/20/23 11:42	1
Sulfate	<0.42		1.0	0.42	mg/L			04/20/23 11:42	1

Lab Sample ID: LCS 310-385595/4

Matrix: Water

Analysis Batch: 385595

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	9.77		mg/L		98	90 - 110
Sulfate	10.0	9.78		mg/L		98	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-384269/1-A

Matrix: Water

Analysis Batch: 385079

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 384269

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		04/14/23 08:45	04/20/23 23:49	1
Barium	<0.64		2.0	0.64	ug/L		04/14/23 08:45	04/20/23 23:49	1
Boron	<76		100	76	ug/L		04/14/23 08:45	04/20/23 23:49	1
Cobalt	<0.17		0.50	0.17	ug/L		04/14/23 08:45	04/20/23 23:49	1
Copper	<1.8		5.0	1.8	ug/L		04/14/23 08:45	04/20/23 23:49	1
Iron	<36		100	36	ug/L		04/14/23 08:45	04/20/23 23:49	1
Manganese	<3.6		10	3.6	ug/L		04/14/23 08:45	04/20/23 23:49	1
Nickel	<1.9		5.0	1.9	ug/L		04/14/23 08:45	04/20/23 23:49	1
Potassium	<150		500	150	ug/L		04/14/23 08:45	04/20/23 23:49	1
Selenium	<1.4		5.0	1.4	ug/L		04/14/23 08:45	04/20/23 23:49	1
Sodium	<460		1000	460	ug/L		04/14/23 08:45	04/20/23 23:49	1
Strontium	2.33		1.0	0.53	ug/L		04/14/23 08:45	04/20/23 23:49	1

Lab Sample ID: MB 310-384269/1-A

Matrix: Water

Analysis Batch: 385266

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 384269

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<190		500	190	ug/L		04/14/23 08:45	04/23/23 15:47	1
Magnesium	<150		500	150	ug/L		04/14/23 08:45	04/23/23 15:47	1

Lab Sample ID: LCS 310-384269/2-A

Matrix: Water

Analysis Batch: 385079

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 384269

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	205		ug/L		102	80 - 120
Barium	100	106		ug/L		106	80 - 120
Boron	200	194		ug/L		97	80 - 120
Cobalt	100	106		ug/L		106	80 - 120
Copper	200	211		ug/L		106	80 - 120
Iron	200	216		ug/L		108	80 - 120

Eurofins Cedar Falls

QC Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

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

Lab Sample ID: LCS 310-384269/2-A
Matrix: Water
Analysis Batch: 385079

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384269

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	100	95.5		ug/L		96	80 - 120
Nickel	200	202		ug/L		101	80 - 120
Potassium	2000	2050		ug/L		103	80 - 120
Selenium	400	385		ug/L		96	80 - 120
Sodium	2000	2080		ug/L		104	80 - 120
Strontium	200	224		ug/L		112	80 - 120

Lab Sample ID: LCS 310-384269/2-A
Matrix: Water
Analysis Batch: 385266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384269

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Calcium	2000	2350		ug/L		117	80 - 120
Magnesium	2000	2240		ug/L		112	80 - 120

Lab Sample ID: MB 310-384845/1-B
Matrix: Water
Analysis Batch: 385266

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 385015

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.53		2.0	0.53	ug/L		04/21/23 08:40	04/23/23 15:59	1
Barium	<0.64		2.0	0.64	ug/L		04/21/23 08:40	04/23/23 15:59	1
Boron	<76		100	76	ug/L		04/21/23 08:40	04/23/23 15:59	1
Calcium	<190		500	190	ug/L		04/21/23 08:40	04/23/23 15:59	1
Cobalt	<0.17		0.50	0.17	ug/L		04/21/23 08:40	04/23/23 15:59	1
Copper	<1.8		5.0	1.8	ug/L		04/21/23 08:40	04/23/23 15:59	1
Iron	<36		100	36	ug/L		04/21/23 08:40	04/23/23 15:59	1
Magnesium	<150		500	150	ug/L		04/21/23 08:40	04/23/23 15:59	1
Manganese	<3.6		10	3.6	ug/L		04/21/23 08:40	04/23/23 15:59	1
Nickel	<1.9		5.0	1.9	ug/L		04/21/23 08:40	04/23/23 15:59	1
Potassium	<150		500	150	ug/L		04/21/23 08:40	04/23/23 15:59	1
Selenium	<1.4		5.0	1.4	ug/L		04/21/23 08:40	04/23/23 15:59	1
Sodium	<460		1000	460	ug/L		04/21/23 08:40	04/23/23 15:59	1
Strontium	<0.53		1.0	0.53	ug/L		04/21/23 08:40	04/23/23 15:59	1

Lab Sample ID: LCS 310-384845/2-B
Matrix: Water
Analysis Batch: 385266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385015

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	216		ug/L		108	80 - 120
Barium	100	109		ug/L		109	80 - 120
Boron	200	209		ug/L		105	80 - 120
Calcium	2000	2300		ug/L		115	80 - 120
Cobalt	100	114		ug/L		114	80 - 120
Copper	200	234		ug/L		117	80 - 120
Iron	200	245	*+	ug/L		123	80 - 120
Magnesium	2000	2270		ug/L		114	80 - 120
Manganese	100	106		ug/L		106	80 - 120

Eurofins Cedar Falls

QC Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

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

Lab Sample ID: LCS 310-384845/2-B

Matrix: Water

Analysis Batch: 385266

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 385015

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nickel	200	227		ug/L		113	80 - 120
Potassium	2000	2310		ug/L		115	80 - 120
Selenium	400	432		ug/L		108	80 - 120
Sodium	2000	2310		ug/L		115	80 - 120
Strontium	200	220		ug/L		110	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-384409/26

Matrix: Water

Analysis Batch: 384409

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/14/23 21:30	1
Carbonate Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/14/23 21:30	1
Total Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/14/23 21:30	1

Lab Sample ID: LCS 310-384409/51

Matrix: Water

Analysis Batch: 384409

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3	1000	1060		mg/L		106	90 - 110

Lab Sample ID: MB 310-384906/2

Matrix: Water

Analysis Batch: 384906

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/19/23 17:18	1
Carbonate Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/19/23 17:18	1
Total Alkalinity as CaCO3	<2.5		5.0	2.5	mg/L			04/19/23 17:18	1

Lab Sample ID: LCS 310-384906/50

Matrix: Water

Analysis Batch: 384906

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3	1000	1020		mg/L		102	90 - 110

Eurofins Cedar Falls

QC Association Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

HPLC/IC

Analysis Batch: 385595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-1	MW-6	Total/NA	Water	9056A	
310-253485-2	MW-11R	Total/NA	Water	9056A	
310-253485-3	MW-12P	Total/NA	Water	9056A	
310-253485-4	MW-12	Total/NA	Water	9056A	
310-253485-5	MW-14	Total/NA	Water	9056A	
310-253485-6	TW-18	Total/NA	Water	9056A	
310-253485-7	FIELD BLANK	Total/NA	Water	9056A	
MB 310-385595/3	Method Blank	Total/NA	Water	9056A	
LCS 310-385595/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 384269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-1	MW-6	Total/NA	Water	3005A	
310-253485-2	MW-11R	Total/NA	Water	3005A	
310-253485-3	MW-12P	Total/NA	Water	3005A	
310-253485-4	MW-12	Total/NA	Water	3005A	
310-253485-5	MW-14	Total/NA	Water	3005A	
310-253485-6	TW-18	Total/NA	Water	3005A	
310-253485-7	FIELD BLANK	Total/NA	Water	3005A	
MB 310-384269/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-384269/2-A	Lab Control Sample	Total/NA	Water	3005A	

Filtration Batch: 384845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-384845/1-B	Method Blank	Total/NA	Water	Filtration	
LCS 310-384845/2-B	Lab Control Sample	Total/NA	Water	Filtration	

Prep Batch: 385015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-384845/1-B	Method Blank	Total/NA	Water	200.8	384845
LCS 310-384845/2-B	Lab Control Sample	Total/NA	Water	200.8	384845

Analysis Batch: 385079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-1	MW-6	Total/NA	Water	6020B	384269
310-253485-2	MW-11R	Total/NA	Water	6020B	384269
310-253485-3	MW-12P	Total/NA	Water	6020B	384269
310-253485-4	MW-12	Total/NA	Water	6020B	384269
310-253485-5	MW-14	Total/NA	Water	6020B	384269
310-253485-6	TW-18	Total/NA	Water	6020B	384269
310-253485-7	FIELD BLANK	Total/NA	Water	6020B	384269
MB 310-384269/1-A	Method Blank	Total/NA	Water	6020B	384269
LCS 310-384269/2-A	Lab Control Sample	Total/NA	Water	6020B	384269

Analysis Batch: 385266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-2	MW-11R	Total/NA	Water	6020B	384269
MB 310-384269/1-A	Method Blank	Total/NA	Water	6020B	384269
MB 310-384845/1-B	Method Blank	Total/NA	Water	6020B	385015

Eurofins Cedar Falls

QC Association Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Metals (Continued)

Analysis Batch: 385266 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-384269/2-A	Lab Control Sample	Total/NA	Water	6020B	384269
LCS 310-384845/2-B	Lab Control Sample	Total/NA	Water	6020B	385015

General Chemistry

Analysis Batch: 384409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-1	MW-6	Total/NA	Water	SM 2320B	
310-253485-2	MW-11R	Total/NA	Water	SM 2320B	
310-253485-3	MW-12P	Total/NA	Water	SM 2320B	
310-253485-4	MW-12	Total/NA	Water	SM 2320B	
310-253485-5	MW-14	Total/NA	Water	SM 2320B	
310-253485-6	TW-18	Total/NA	Water	SM 2320B	
MB 310-384409/26	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-384409/51	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 384906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-7	FIELD BLANK	Total/NA	Water	SM 2320B	
MB 310-384906/2	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-384906/50	Lab Control Sample	Total/NA	Water	SM 2320B	

Field Service / Mobile Lab

Analysis Batch: 386068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-253485-1	MW-6	Total/NA	Water	Field Sampling	
310-253485-2	MW-11R	Total/NA	Water	Field Sampling	
310-253485-3	MW-12P	Total/NA	Water	Field Sampling	
310-253485-4	MW-12	Total/NA	Water	Field Sampling	
310-253485-5	MW-14	Total/NA	Water	Field Sampling	
310-253485-6	TW-18	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-6

Date Collected: 04/11/23 10:20

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 14:18
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:12
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 01:06
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/11/23 10:20

Client Sample ID: MW-11R

Date Collected: 04/10/23 16:00

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 14:33
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:15
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		4	385266	ZRI4	EET CF	04/23/23 15:53
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 01:17
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/10/23 16:00

Client Sample ID: MW-12P

Date Collected: 04/11/23 15:05

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 14:49
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:18
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 01:34
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/11/23 15:05

Client Sample ID: MW-12

Date Collected: 04/11/23 14:25

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 15:05
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:21
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 01:46
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/11/23 14:25

Eurofins Cedar Falls

Lab Chronicle

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Client Sample ID: MW-14

Date Collected: 04/11/23 15:15

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 15:20
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:39
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 01:57
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/11/23 15:13

Client Sample ID: TW-18

Date Collected: 04/11/23 13:00

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	385595	QTZ5	EET CF	04/20/23 15:36
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:42
Total/NA	Analysis	SM 2320B		1	384409	MAQ3	EET CF	04/15/23 02:08
Total/NA	Analysis	Field Sampling		1	386068	BJ0R	EET CF	04/11/23 13:00

Client Sample ID: FIELD BLANK

Date Collected: 04/11/23 14:40

Date Received: 04/13/23 09:15

Lab Sample ID: 310-253485-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	385595	QTZ5	EET CF	04/20/23 15:51
Total/NA	Prep	3005A			384269	DHM5	EET CF	04/14/23 08:45
Total/NA	Analysis	6020B		1	385079	ZRI4	EET CF	04/21/23 01:45
Total/NA	Analysis	SM 2320B		1	384906	MAQ3	EET CF	04/19/23 19:37

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: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Method Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station - 25223070

Job ID: 310-253485-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
SM 2320B	Alkalinity	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.

Laboratory References:

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



Environment Testing
America



310-253485 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
Receipt Information			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-13-23</u>	<u>915</u>	<u>ML</u>
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 # <u>1</u> of <u>3</u>
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:		Correction Factor (°C):	
<u>W</u>		<u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
<u>0.8</u>		<u>0.8</u>	
• 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			
<u>MW-12 FB TW-18 MW-6 MW-12P MW-11R</u>			
<u>MW-14 MW-6</u>			

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
Receipt Information			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-13-23</u>	<u>9:15</u>	<u>MC</u>
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?		If yes: Cooler ID:	
☒ Yes ☐ No			
Multiple Coolers?		If yes: Cooler # <u>2</u> of <u>3</u>	
☒ Yes ☐ No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
☒ Yes ☐ No		☒ Yes ☐ No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
☐ Yes ☒ No		☐ Yes ☐ No	
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
☐ Yes ☒ No			
Temperature Record			
Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE			
Thermometer ID:		Correction Factor (°C):	
<u>W</u>		<u>0</u>	
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
<u>-0.1</u>		<u>-0.1</u>	
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			
<u>MW-302 MW-302A MW-306A MW-305</u>			
<u>MW-304 FB</u>			

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
Receipt Information			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-13-23</u>	<u>915</u>	<u>Mc</u>
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?		If yes: Cooler ID:	
☒ Yes ☐ No			
Multiple Coolers?		If yes: Cooler # <u>3</u> of <u>3</u>	
☒ Yes ☐ No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact? ☒ Yes ☐ No	
☒ Yes ☐ No			
Sample Custody Seals Present?		If yes: Sample custody seals intact? ☐ Yes ☐ No	
☐ Yes ☒ No			
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
☐ Yes ☒ No			
Temperature Record			
Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE			
Thermometer ID:		Correction Factor (°C):	
<u>W</u>		<u>0</u>	
Temp Blank Temperature: If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
<u>2.1</u>		<u>2.1</u>	
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			
<u>MW-307 MW-304A MW-304 MW-307A</u>			

Client Information		Lab PM: Sandie Fredrick		Carrier Tracking No(s):		COC No	
Client Contact: Meghan Blodgett		E-Mail: Sandie.Fredrick@eleufinsus.com		State of Origin:		Page: 1 of 1	
Company: SCS Engineers		PWSID:		Analysis Requested			
Address: 2830 Dairy Drive		Due Date Requested:		Total Number of Containers			
City: Madison		TAT Requested (days)		Preservation Codes			
State, Zip: WI, 53718		Compliance Project: ☐ Yes ☒ No		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 Other:			
Phone: 608-224-2830		PO #:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
Email: mbloджетт@scsengineers.com		WO #:		Special Instructions/Note:			
Project Name: Lansing Generating Station 25223070		Project #:					
Site: Lansing, IA		SSOW#:					

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=oil, A=air)	Field Filtered Sample (Yes or No)		Preservation Code:		Chloride Sulfate	Bicarbonate & carbonate alkalinity	pH (at 25°C, 10 min, 10 min, 10 min, 10 min)	Total Number of Containers	Special Instructions/Note:
					Field Filtered	Sample (Yes or No)	Code	Code					
MMW-6	4/11/23	1020	G	W	N	X	X	X	X	X			
MMW-11R	4/10/23	1600	G	W	N	X	X	X	X	X			
MMW-12P	4/11/23	1505	G	W	N	X	X	X	X	X			
MMW-12B	4/11/23	1425	G	W	N	X	X	X	X	X			Void
MMW-13	4/11/23	1513	G	W	N	X	X	X	X	X			Void
MMW-14	4/11/23	1300	G	W	N	X	X	X	X	X			
MMW-15	4/11/23	1440	G	W	N	X	X	X	X	X			
TW-18	4/11/23	1300	G	W	N	X	X	X	X	X			
Field Blank	4/11/23	1440	G	W	N	X	X	X	X	X			

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

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

Empty Kit Relinquished by for

Relinquished by for **Date** 4/12/23 1400 **Company** SS

Relinquished by for **Date** 4/12/23 1400 **Company** SS

Relinquished by for **Date** 4/12/23 1400 **Company** SS

Custody Seal No 4/13/23 0915

Samples spread across 3 coolers

Table 1. Sampling Points and Parameters - State Sampling Program
Groundwater Monitoring - Lansing Generating CCR Landfill
SCS Engineers Project #25221070

Parameter (a,b)	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-20	MW-21	MW-22	MW-23	MW-24	MW-25	MW-26	MW-27	MW-28	MW-29	MW-30	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-37	MW-38	MW-39	MW-40	MW-41	MW-42	MW-43	MW-44	MW-45	MW-46	MW-47	MW-48	MW-49	MW-50	MW-51	MW-52	MW-53	MW-54	MW-55	MW-56	MW-57	MW-58	MW-59	MW-60	MW-61	MW-62	MW-63	MW-64	MW-65	MW-66	MW-67	MW-68	MW-69	MW-70	MW-71	MW-72	MW-73	MW-74	MW-75	MW-76	MW-77	MW-78	MW-79	MW-80	MW-81	MW-82	MW-83	MW-84	MW-85	MW-86	MW-87	MW-88	MW-89	MW-90	MW-91	MW-92	MW-93	MW-94	MW-95	MW-96	MW-97	MW-98	MW-99	MW-100	MW-101	MW-102	MW-103	MW-104	MW-105	MW-106	MW-107	MW-108	MW-109	MW-110	MW-111	MW-112	MW-113	MW-114	MW-115	MW-116	MW-117	MW-118	MW-119	MW-120	MW-121	MW-122	MW-123	MW-124	MW-125	MW-126	MW-127	MW-128	MW-129	MW-130	MW-131	MW-132	MW-133	MW-134	MW-135	MW-136	MW-137	MW-138	MW-139	MW-140	MW-141	MW-142	MW-143	MW-144	MW-145	MW-146	MW-147	MW-148	MW-149	MW-150	MW-151	MW-152	MW-153	MW-154	MW-155	MW-156	MW-157	MW-158	MW-159	MW-160	MW-161	MW-162	MW-163	MW-164	MW-165	MW-166	MW-167	MW-168	MW-169	MW-170	MW-171	MW-172	MW-173	MW-174	MW-175	MW-176	MW-177	MW-178	MW-179	MW-180	MW-181	MW-182	MW-183	MW-184	MW-185	MW-186	MW-187	MW-188	MW-189	MW-190	MW-191	MW-192	MW-193	MW-194	MW-195	MW-196	MW-197	MW-198	MW-199	MW-200	MW-201	MW-202	MW-203	MW-204	MW-205	MW-206	MW-207	MW-208	MW-209	MW-210	MW-211	MW-212	MW-213	MW-214	MW-215	MW-216	MW-217	MW-218	MW-219	MW-220	MW-221	MW-222	MW-223	MW-224	MW-225	MW-226	MW-227	MW-228	MW-229	MW-230	MW-231	MW-232	MW-233	MW-234	MW-235	MW-236	MW-237	MW-238	MW-239	MW-240	MW-241	MW-242	MW-243	MW-244	MW-245	MW-246	MW-247	MW-248	MW-249	MW-250	MW-251	MW-252	MW-253	MW-254	MW-255	MW-256	MW-257	MW-258	MW-259	MW-260	MW-261	MW-262	MW-263	MW-264	MW-265	MW-266	MW-267	MW-268	MW-269	MW-270	MW-271	MW-272	MW-273	MW-274	MW-275	MW-276	MW-277	MW-278	MW-279	MW-280	MW-281	MW-282	MW-283	MW-284	MW-285	MW-286	MW-287	MW-288	MW-289	MW-290	MW-291	MW-292	MW-293	MW-294	MW-295	MW-296	MW-297	MW-298	MW-299	MW-300	MW-301	MW-302	MW-303	MW-304	MW-305	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319	MW-320	MW-321	MW-322	MW-323	MW-324	MW-325	MW-326	MW-327	MW-328	MW-329	MW-330	MW-331	MW-332	MW-333	MW-334	MW-335	MW-336	MW-337	MW-338	MW-339	MW-340	MW-341	MW-342	MW-343	MW-344	MW-345	MW-346	MW-347	MW-348	MW-349	MW-350	MW-351	MW-352	MW-353	MW-354	MW-355	MW-356	MW-357	MW-358	MW-359	MW-360	MW-361	MW-362	MW-363	MW-364	MW-365	MW-366	MW-367	MW-368	MW-369	MW-370	MW-371	MW-372	MW-373	MW-374	MW-375	MW-376	MW-377	MW-378	MW-379	MW-380	MW-381	MW-382	MW-383	MW-384	MW-385	MW-386	MW-387	MW-388	MW-389	MW-390	MW-391	MW-392	MW-393	MW-394	MW-395	MW-396	MW-397	MW-398	MW-399	MW-400	MW-401	MW-402	MW-403	MW-404	MW-405	MW-406	MW-407	MW-408	MW-409	MW-410	MW-411	MW-412	MW-413	MW-414	MW-415	MW-416	MW-417	MW-418	MW-419	MW-420	MW-421	MW-422	MW-423	MW-424	MW-425	MW-426	MW-427	MW-428	MW-429	MW-430	MW-431	MW-432	MW-433	MW-434	MW-435	MW-436	MW-437	MW-438	MW-439	MW-440	MW-441	MW-442	MW-443	MW-444	MW-445	MW-446	MW-447	MW-448	MW-449	MW-450	MW-451	MW-452	MW-453	MW-454	MW-455	MW-456	MW-457	MW-458	MW-459	MW-460	MW-461	MW-462	MW-463	MW-464	MW-465	MW-466	MW-467	MW-468	MW-469	MW-470	MW-471	MW-472	MW-473	MW-474	MW-475	MW-476	MW-477	MW-478	MW-479	MW-480	MW-481	MW-482	MW-483	MW-484	MW-485	MW-486	MW-487	MW-488	MW-489	MW-490	MW-491	MW-492	MW-493	MW-494	MW-495	MW-496	MW-497	MW-498	MW-499	MW-500	MW-501	MW-502	MW-503	MW-504	MW-505	MW-506	MW-507	MW-508	MW-509	MW-510	MW-511	MW-512	MW-513	MW-514	MW-515	MW-516	MW-517	MW-518	MW-519	MW-520	MW-521	MW-522	MW-523	MW-524	MW-525	MW-526	MW-527	MW-528	MW-529	MW-530	MW-531	MW-532	MW-533	MW-534	MW-535	MW-536	MW-537	MW-538	MW-539	MW-540	MW-541	MW-542	MW-543	MW-544	MW-545	MW-546	MW-547	MW-548	MW-549	MW-550	MW-551	MW-552	MW-553	MW-554	MW-555	MW-556	MW-557	MW-558	MW-559	MW-560	MW-561	MW-562	MW-563	MW-564	MW-565	MW-566	MW-567	MW-568	MW-569	MW-570	MW-571	MW-572	MW-573	MW-574	MW-575	MW-576	MW-577	MW-578	MW-579	MW-580	MW-581	MW-582	MW-583	MW-584	MW-585	MW-586	MW-587	MW-588	MW-589	MW-590	MW-591	MW-592	MW-593	MW-594	MW-595	MW-596	MW-597	MW-598	MW-599	MW-600	MW-601	MW-602	MW-603	MW-604	MW-605	MW-606	MW-607	MW-608	MW-609	MW-610	MW-611	MW-612	MW-613	MW-614	MW-615	MW-616	MW-617	MW-618	MW-619	MW-620	MW-621	MW-622	MW-623	MW-624	MW-625	MW-626	MW-627	MW-628	MW-629	MW-630	MW-631	MW-632	MW-633	MW-634	MW-635	MW-636	MW-637	MW-638	MW-639	MW-640	MW-641	MW-642	MW-643	MW-644	MW-645	MW-646	MW-647	MW-648	MW-649	MW-650	MW-651	MW-652	MW-653	MW-654	MW-655	MW-656	MW-657	MW-658	MW-659	MW-660	MW-661	MW-662	MW-663	MW-664	MW-665	MW-666	MW-667	MW-668	MW-669	MW-670	MW-671	MW-672	MW-673	MW-674	MW-675	MW-676	MW-677	MW-678	MW-679	MW-680	MW-681	MW-682	MW-683	MW-684	MW-685	MW-686	MW-687	MW-688	MW-689	MW-690	MW-691	MW-692	MW-693	MW-694	MW-695	MW-696	MW-697	MW-698	MW-699	MW-700	MW-701	MW-702	MW-703	MW-704	MW-705	MW-706	MW-707	MW-708	MW-709	MW-710	MW-711	MW-712	MW-713	MW-714	MW-715	MW-716	MW-717	MW-718	MW-719	MW-720	MW-721	MW-722	MW-723	MW-724	MW-725	MW-726	MW-727	MW-728	MW-729	MW-730	MW-731	MW-732	MW-733	MW-734	MW-735	MW-736	MW-737	MW-738	MW-739	MW-740	MW-741	MW-742	MW-743	MW-744	MW-745	MW-746	MW-747	MW-748	MW-749	MW-750	MW-751	MW-752	MW-753	MW-754	MW-755	MW-756	MW-757	MW-758	MW-759	MW-760	MW-761	MW-762	MW-763	MW-764	MW-765	MW-766	MW-767	MW-768	MW-769	MW-770	MW-771	MW-772	MW-773	MW-774	MW-775	MW-776	MW-777	MW-778	MW-779	MW-780	MW-781	MW-782	MW-783	MW-784	MW-785	MW-786	MW-787	MW-788	MW-789	MW-790	MW-791	MW-792	MW-793	MW-794	MW-795	MW-796	MW-797	MW-798	MW-799	MW-800	MW-801	MW-802	MW-803	MW-804	MW-805	MW-806	MW-807	MW-808	MW-809	MW-810	MW-811	MW-812	MW-813	MW-814	MW-815	MW-816	MW-817	MW-818	MW-819	MW-820	MW-821	MW-822	MW-823	MW-824	MW-825	MW-826	MW-827	MW-828	MW-829	MW-830	MW-831	MW-832	MW-833	MW-834	MW-835	MW-836	MW-837	MW-838	MW-839	MW-840	MW-841	MW-842	MW-843	MW-844	MW-845	MW-846	MW-847	MW-848	MW-849	MW-850	MW-851	MW-852	MW-853	MW-854	MW-855	MW-856	MW-857	MW-858	MW-859	MW-860	MW-861	MW-862	MW-863	MW-864	MW-865	MW-866	MW-867	MW-868	MW-869	MW-870	MW-871	MW-872	MW-873	MW-874	MW-875	MW-876	MW-877	MW-878	MW-879	MW-880	MW-881	MW-882	MW-883	MW-884	MW-885	MW-886	MW-887	MW-888	MW-889	MW-890	MW-891	MW-892	MW-893	MW-894	MW-895	MW-896	MW-897	MW-898	MW-899	MW-900	MW-901	MW-902	MW-903	MW-904	MW-905	MW-906	MW-907	MW-908	MW-909	MW-910	MW-911	MW-912	MW-913	MW-914	MW-915	MW-916	MW-917	MW-918	MW-919	MW-920	MW-921	MW-922	MW-923	MW-924	MW-925	MW-926	MW-927	MW-928	MW-929	MW-930	MW-931	MW-932	MW-933	MW-934	MW-935	MW-936	MW-937	MW-938	MW-939	MW-940	MW-941	MW-942	MW-943	MW-944	MW-945	MW-946	MW-947	MW-948	MW-949	MW-950	MW-951	MW-952	MW-953	MW-954	MW-955	MW-956	MW-957	MW-958	MW-959	MW-960	MW-961	MW-962	MW-963	MW-964	MW-965	MW-966	MW-967	MW-968	MW-969	MW-970	MW-971	MW-972	MW-973	MW-974	MW-975	MW-976	MW-977	MW-978	MW-979	MW-980	MW-981	MW-982	MW-983	MW-984	MW-985	MW-986	MW-987	MW-988	MW-989	MW-990	MW-991	MW-992	MW-993	MW-994	MW-995	MW-996	MW-997	MW-998	MW-999	MW-1000	MW-1001	MW-1002	MW-1003	MW-1004	MW-1005	MW-1006	MW-1007	MW-1008	MW-1009	MW-1010	MW-1011	MW-1012	MW-1013	MW-1014	MW-1015	MW-1016	MW-1017	MW-1018	MW-1019	MW-1020	MW-1021	MW-1022	MW-1023	MW-1024	MW-1025	MW-1026	MW-1027	MW-1028	MW-1029	MW-1030	MW-1031	MW-1032	MW-1033	MW-1034	MW-1035	MW-1036	MW-1037	MW-1038	MW-1039	MW-1040	MW-1041	MW-1042	MW-1043	MW-1044	MW-1045	MW-1046	MW-1047	MW-1048	MW-1049	MW-1050	MW-1051	MW-1052	MW-1053	MW-1054	MW-1055	MW-1056	MW-1057	MW-1058	MW-1059	MW-1060	MW-1061	MW-1062	MW-1063	MW-1064	MW-1065	MW-1066	MW-1067	MW-1068	MW-1069	MW-1070	MW-1071	MW-1072	MW-1073	MW-1074	MW-1075	MW-1076	MW-1077	MW-1078	MW-1079	MW-1080	MW-1081	MW-1082	MW-1083	MW-1084	MW-1085	MW-1086	MW-1087	MW-1088	MW-1089	MW-1090	MW-1091	MW-1092	MW-1093	MW-1094	MW-1095	MW-1096	MW-1097	MW-1098	MW-1099	MW-1100	MW-1101	MW-1102	MW-1103	MW-1104	MW-1105	MW-1106	MW-1107	MW-1108	MW-1109	MW-1110	MW-1111	MW-1112	MW-1113	MW-1114	MW-1115	MW-1116	MW-1117	MW-1118	MW-1119	MW-1120	MW-1121	MW-1122	MW-1123	MW-1124	MW-1125	MW-1126	MW-1127	MW-1128	MW-1129	MW-1130	MW-1131	MW-1132	MW-1133	MW-1134	MW-1135	MW-1136	MW-1137	MW-1138	MW-1139	MW-1140	MW-1141	MW-1142	MW-1143	MW-1144	MW-1145	MW-1146	MW-1147	MW-1148	MW-1149	MW-1150	MW-1151	MW-1152	MW-1153	MW-1154	MW-1155	MW-1156	MW-1157	MW-1158	MW-1159	MW-1160	MW-1161	MW-1162	MW-1163	MW-1164	MW-1165	MW-1166	MW-1167	MW-1168	MW-1169	MW-1170	MW-1171	MW-1172	MW-1173	MW-1174	MW-1175	MW-1176	MW-1177	MW-1178	MW-1179	MW-1180	MW-1181	MW-1182	MW-1183	MW-1184	MW-1185	MW-1186	MW-1187	MW-1188	MW-1189	MW-1190	MW-1191	MW-1192	MW-1193	MW-1194	MW-1195	MW-1196	MW-1197	MW-1198	MW-1199	MW-1200	MW-1201	MW-1202	MW-1203	MW-1204	MW-1205	MW-1206	MW-1207	MW-1208	MW-1209	MW-1210	MW-1211	MW-1212	MW-1213	MW-1214	MW-1215	MW-1216</
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Sample Login Analytes / Limits

Job 310-253485-1

Client Job Description:	Lansing Generating Station - 25223070	Report To:	SCS Engineers
Purchase Order #:	25223070		Meghan Blodgett
Work Order #:			2830 Dairy Drive
Project Manager:	Sandie Fredrick		Madison, WI 53718
Job Due Date:	4/27/2023		
Job TAT:	10 Days		
Max Deliverable Level:	II	Bill To:	SCS Engineers
			Ashley Radunzel
Earliest Deliverable Due:	4/27/2023		2830 Dairy Drive
			Madison, WI 53718

Login 310-253485

Sample Receipt:	4/13/2023 9:15:00 AM	Number of Coolers:	3
Method of Delivery:	FedEx Priority Overnight	Cooler Temperature(s) (C°):	-0.1; 0.8; 2.1;

Method	Rpt Basis	Units	Sample #s Applicable
Method Description			
2320B	Total	MDL RL	1,2,3,4,5,6
Alkalinity			
Bicarbonate Alkalinity as CaCO3	2.5	5	mg/L
Carbonate Alkalinity as CaCO3	2.5	5	mg/L
Total Alkalinity as CaCO3	2.5	5	mg/L
2320B_LL	Total	MDL RL	7
Alkalinity			
Bicarbonate Alkalinity as CaCO3	2.5	5	mg/L
Carbonate Alkalinity as CaCO3	2.5	5	mg/L
Total Alkalinity as CaCO3	2.5	5	mg/L
6020B	Total	MDL RL	1,2,3,4,5,6
Metals (22)			
Arsenic	0.53	2	ug/L
Barium	0.64	2	ug/L
Beryllium	0.33	1	ug/L
Cobalt	0.17	0.5	ug/L
Copper	1.8	5	ug/L
Iron	36	100	ug/L
Magnesium	150	500	ug/L
Manganese	3.6	10	ug/L
Nickel	1.9	5	ug/L
Potassium	150	500	ug/L
Selenium	1.4	5	ug/L
Sodium	460	1000	ug/L
Strontium	0.53	1	ug/L
6020B	Total	MDL RL	7
Metals (22)			
Antimony	1	2	ug/L
Arsenic	0.53	2	ug/L
Barium	0.64	2	ug/L
Beryllium	0.33	1	ug/L
Boron	76	100	ug/L
Cadmium	0.1	0.2	ug/L
Calcium	0.19	0.5	mg/L
Chromium	1.1	5	ug/L
Cobalt	0.17	0.5	ug/L
Copper	1.8	5	ug/L
Iron	36	100	ug/L
Lead	0.24	0.5	ug/L
Lithium	2.5	10	ug/L
Magnesium	150	500	ug/L
Manganese	3.6	10	ug/L

Sample Login Analytes / Limits

Method	Rpt Basis			Units	Sample #s Applicable
Method Description					
	Molybdenum	0.91	2	ug/L	
	Nickel	1.9	5	ug/L	
	Potassium	150	500	ug/L	
	Selenium	1.4	5	ug/L	
	Sodium	460	1000	ug/L	
	Strontium	0.53	1	ug/L	
	Thallium	0.26	1	ug/L	
7470A	Total	MDL	RL		1,2,3,4,5,6,7
Mercury					
	Mercury	0.14	0.2	ug/L	
9056A_ORGFM_28D	Total	MDL	RL		1,2,3,4,5,6,7
Chloride & Sulfate					
	Chloride	0.45	1	mg/L	
	Sulfate	0.42	1	mg/L	
FieldSampling	Total	RL	RL		1,2,3,4,5,6
Field Parameters					
	Ground Water Elevation			ft	
	Oxidation Reduction Potential			millivolts	
	Oxygen, Dissolved, Client Supplied			mg/L	
	pH, Field	0.1	0.1	SU	
	Specific Conductance, Field			umhos/cm	
	Temperature, Field	0.1	0.1	Degrees C	
	Turbidity, Field			NTU	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-253485-1

Login Number: 253485

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Fredrick, Sandie

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Groundwater Monitoring Results - Field Parameters
Lansing Generating Station / SCS Engineers Project #25223070.00
April 2023

Sample	Sample Date	Groundwater Elevation (ft AMSL)	Temperature (Deg C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity (NTU)
MW-6	4/11/2023	664.79	9.9	7.15	8.38	595.6	141.4	0.97
MW-11R	4/10/2023	643.72	12.5	6.90	0.10	1728	21.6	3.88
MW-12	4/11/2023	650.75	11.4	7.17	0.07	1030	140.3	4.75
MW-12P	4/11/2023	649.09	11.3	7.13	1.96	980	131.4	2.95
MW-13	4/10/2023	DRY	--	--	--	--	--	--
MW-14	4/11/2023	641.64	9.1	7.77	6.00	409.8	68.9	1.28
MW-15	4/10/2023	DRY	--	--	--	--	--	--
TW-18	4/11/2023	648.50	6.1	7.06	0.17	887	103.6	4.29

Abbreviations:

AMSL = above mean sea level

µmhos/cm = microSiemens per centimeter

mg/L = milligrams per liter

mV = millivolts

ORP = Oxidation Reduction (REDOX)

NTU = Nephelometric Turbidity Units

Laboratory Notes/Qualifiers:

none

Created by: NDK
 Last revision by: RM
 Checked by: DK

Date: 4/20/2021
 Date: 5/1/2023
 Date: 5/1/2023

C:\Users\hld0\AppData\Local\Microsoft\Windows\NetCache\Content.Outlook\USG3GGGC\[April 2023_Lansing_State_Field.xlsx]Data



Appendix C

Summary of Groundwater Chemistry – Pre-2019

Table 3. Historical Groundwater Analytical Results Summary
Alliant-Lansing CCR Landfill / SCS Engineers Project #25216070.18
(Results are in µg/L, unless otherwise noted)

Sample	Date	DO, Field (mg/L)	Redox, Field (mV)	pH, Field (SU)	Temp., Field (deg C)	Specific Conduc- tance, Field (µS/cm)	Alkalinity, Total As CaCO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Barium (µg/L)	Boron (µg/L)	Calcium (mg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Magnesium (mg/L)	Manganese (µg/L)	Nickel (µg/L)	Potassium (mg/L)	Selenium (µg/L)	Sodium (mg/L)	Strontium (µg/L)
MW3	5/11/2001	NA	NA	NA	NA	NA	NA	<5.0	75	<1.8	45	NA	NA	<3.6	<13	<33	39	9.4	NA	NA	<1.5	NA	NA
MW4	5/11/2001	NA	NA	NA	NA	NA	NA	<5.0	44	<1.8	32	NA	NA	<3.6	<13	<33	37	2.1	NA	NA	<1.5	NA	NA
	3/8/2002	NA	NA	NA	NA	NA	NA	<5.0	43	<0.88	39	NA	NA	<11	<9.1	<22	39	2.3	NA	NA	<0.73	NA	NA
	2/19/2004	NA	NA	NA	NA	NA	NA	<5.0 D	36	<3.5	33	NA	NA	7.4	19	<16	36	3.6	NA	NA	<4.3	NA	NA
	5/26/2004	NA	NA	NA	NA	NA	NA	5.7	51	3.3	27	NA	NA	<6.3	<18	<16	37	<0.96	NA	NA	<3.2	NA	NA
	8/23/2004	NA	NA	NA	NA	NA	NA	5.4	49	<0.79	37	NA	NA	<6.3	<18	<16	38	<0.96	NA	NA	<3.2	NA	NA
	11/18/2004	NA	NA	NA	NA	NA	NA	<5.0	43	<0.79	36	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	5/5/2005	NA	NA	NA	NA	NA	NA	<5.0	50	<0.79	40	NA	NA	<6.3	<18	<16	38	2.5 J	NA	NA	<3.2	NA	NA
	5/19/2006	NA	NA	NA	NA	NA	NA	<10	48	2.9	38	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	5/30/2007	NA	NA	NA	NA	NA	NA	4.6	130	<1	40	NA	NA	<6.3	<18	<16	37	2.0 J	NA	NA	<3.2	NA	NA
	4/16/2008	NA	NA	NA	NA	NA	NA	7.4	54	<0.43	44	NA	NA	<6.3	<18	<16	40	2.2 J	NA	NA	<1.44	NA	NA
	4/3/2009	NA	NA	NA	NA	NA	NA	4.9	44	0.27 J	44	NA	NA	0.17 J	2.0 B	160 J	39	0.98	NA	NA	1.1 B	NA	NA
	4/21/2010	NA	NA	7.47	13.9	647	NA	5.49	39.1	<1.0	39.3	<100	NA	3.97 J	<20	<100	39.2	<10	NA	NA	<5.0	NA	NA
	5/4/2011	NA	NA	7.31	11.2	648	NA	6.98	44.8	<1.0	43.9	<100	NA	<1.55	<20	<100	42.7	<10	NA	NA	<5.0	NA	NA
	5/4/2011(Dup)	NA	NA	7.31	11.2	648	NA	6.40	45.7	<2.0 RL	43.2	<100	NA	<1.55	<20	<100	42.2	<10	NA	NA	<5.0	NA	NA
	4/25/2012	NA	NA	7.36	11.9	649	NA	5.12	40	<1.0	45.2	<100	NA	<1.55	<20	<100	42.6	<10	NA	NA	<5.0	NA	NA
	4/2/2013	NA	NA	7.74	11.6	583	287 HI	5.9	50.2	<1.0	48	<100	71.0	<5.0	<10	<50	41.5	6.9	<5.0	1.1	2.4	6.0	76
	7/2/2013	NA	NA	7.33	11.4	736	289	6.1	43.2	<1.0	45	140	71.7	<5.0	<10	<50	41.2	<5.0	<5.0	1.2	2.5	7.2	87
	4/29/2014	5.27	110	7.33	10.9	619	332	6.4	44.5	0.62 J	46	61 J	73.0	<0.79	3.5 J	<24	37.6	<2.5	<0.95	0.66	1.5	5.3	86
	5/29/2014	6.48	111	7.6	13.0	480	284	6.2	39.3	<0.18	44	<50	76.2	<0.79	<0.85	<24	40.3	<2.5	<0.95	1.2	0.57 J	5.1	78
	4/21/2015	NA	NA	7.39	10.6	566	331	6.3	40.9	<0.25	45	36 J	75.1	<0.10	1.3 J	<9.0	40.8	2.6 J	1.8 J	1.1	0.71 J	4.7	80
	4/28/2016	7.94	263.5	7.62	10.0	442.8	280	6.3	38.1	0.30 J	44.5	<50.0	73.7 MI	<0.50	0.37 JB	177	40.3	3.3	<0.27	1.04	0.76 J	4.5	71.9 N2
	4/20/2017	9.5	205	7.45	10.0	636	286	5.5	49.6	0.33 J	49.9	134	76.4 MI	0.15 JB	0.35 JB	161 B	43	8.3	0.40 JB	1.29	2.0	5.94	90.5 N2
MW5	3/8/2002	NA	NA	NA	NA	NA	NA	<5.0	45	<0.88	29	NA	NA	<11	<9.1	<22	39	2.5	NA	NA	<0.73	NA	NA
	2/19/2004	NA	NA	NA	NA	NA	NA	<5.0 D	34	<3.5	32	NA	NA	<6.3	18	<16	36	3.8	NA	NA	<4.3	NA	NA
	5/26/2004	NA	NA	NA	NA	NA	NA	<5.0 D	43	4.7	27	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	8/23/2004	NA	NA	NA	NA	NA	NA	5.4	45	0.92	36	NA	NA	<6.3	<18	<16	38	<0.96	NA	NA	<3.2	NA	NA
	11/18/2004	NA	NA	NA	NA	NA	NA	<5.0	40	<0.79	35	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	5/5/2005	NA	NA	NA	NA	NA	NA	5.7	49	<0.79	37	NA	NA	<6.3	<18	<16	38	1.5 J	NA	NA	<3.2	NA	NA
	5/19/2006	NA	NA	NA	NA	NA	NA	<10.0	40	<0.79	38	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	5/30/2007	NA	NA	NA	NA	NA	NA	4.3	110	<1	40	NA	NA	<6.3	<18	<16	37	2.3 J	NA	NA	<3.2	NA	NA
	4/16/2008	NA	NA	NA	NA	NA	NA	5.3	40	<0.43	42	NA	NA	<6.3	<18	<16	39	0.98 J	NA	NA	<1.44	NA	NA
	04/16/08 Dup	NA	NA	NA	NA	NA	NA	5.4	40	<0.43	43	NA	NA	<6.3	<18	<16	38	4.1	NA	NA	<1.44	NA	NA
	4/3/2009	NA	NA	NA	NA	NA	NA	5.3	41	0.22 J	44	NA	NA	0.15 J	0.5 B	150 J	38	0.65	NA	NA	0.64 B	NA	NA
	4/21/2010	NA	NA	7.43	13.7	636	NA	5.34	35.6	<1.0	38.5	<100	NA	<1.55 J	<20	<100	39.1	<10	NA	NA	<5.0	NA	NA
	4/21/2010 (Dup)	NA	NA	NA	NA	NA	NA	5.51	37.6	<1.0	38.7	<100	NA	2.09 J	<20	<100	39.4	<10.0	NA	NA	<5.0	NA	NA
	5/4/2011	NA	NA	7.31	10.9	635	NA	6.79	40.2	<1.0	43.1	<100	NA	<1.55	<20	<100	41.6	<10	NA	NA	<5.0	NA	NA
	4/25/2012	NA	NA	7.32	11.1	648	NA	<5.0 RL1	37.1	<1.0	45	<100	NA	3.82 J	<20	<100	42.6	<10	NA	NA	<5.0	NA	NA

Table 3. Historical Groundwater Analytical Results Summary
Alliant-Lansing CCR Landfill / SCS Engineers Project #25216070.18
(Results are in µg/L, unless otherwise noted)

Sample	Date	DO, Field (mg/L)	Redox, Field (mV)	pH, Field (SU)	Temp., Field (deg C)	Specific Conduc- tance, Field (µS/cm)	Alkalinity, Total As CaCO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Barium (µg/L)	Boron (µg/L)	Calcium (mg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Magnesium (mg/L)	Manganese (µg/L)	Nickel (µg/L)	Potassium (mg/L)	Selenium (µg/L)	Sodium (mg/L)	Strontium (µg/L)
MW5 (continued)	4/2/2013	NA	NA	7.58	11.8	576	276 ^{H1}	5.9	40.3	<1.0	47	<100	70.7	<5.0	<10	<50	40.8	5.2	<5.0	1.2	1.2	5.2	73
	7/2/2013	NA	NA	7.32	11.3	687	296	7.3	51.9	<1.0	47	140	75	<5.0	<10	<50	42.0	<5.0	<5.0	1.5	2.2	6.7	79
	4/29/2014	5.31	136	7.27	10.8	615	339	6.3	39.4	0.65 ^J	46	<50	73.3 ^{M1}	<0.79	3.5 ^J	<24	38.1	<2.5	<0.95	0.71	0.88 ^J	5.0	91
	5/29/2014	5.62	113	7.6	12.9	480	289	6.2	37.4	1.3	42	<50	74.1	<0.79	17	<24	39.4	<2.5	1.3 ^J	2.7	0.7 ^J	5.0	75
	4/21/2015	NA	NA	7.40	10.9	553	326	6.2	40.1	<0.25	44	34 ^J	74.9	<0.10	1.6 ^J	10 ^J	40.6	<2.4	0.86 ^J	1.1	0.73 ^J	5.7	75
	4/28/2016	8.13	282.2	7.59	10	620.7	286	6.4	37.5	0.26 ^J	44.5	<50.0	74	<0.50	0.32 ^{JB}	75.4	40.3	4.4	<0.27	1.03	0.69 ^J	4.46	68.4 ^{N2}
	4/20/2017	8.8	174	7.44	10	630	299	5.5	44.4	0.26 ^J	50.5	80.7 ^J	73.2	0.094 ^{JB}	0.40 ^{JB}	182	41.3	8.1	0.52 ^{JB}	1.11	1.2	5.52	79.1 ^{N2}
MW6	5/11/2001	NA	NA	NA	NA	NA	NA	<5.0	29	<1.8	33	NA	NA	<3.6	<13	<33	35	4.6	NA	NA	<1.5	NA	NA
	3/8/2002	NA	NA	NA	NA	NA	NA	<5.0	33	<0.88	38	NA	NA	<11	<9.1	<22	38	2.5	NA	NA	<0.73	NA	NA
	2/19/2004	NA	NA	NA	NA	NA	NA	<5.0 ^D	25	<3.5	33	NA	NA	Z	18	<16	35	3.6	NA	NA	<4.3	NA	NA
	5/26/2004	NA	NA	NA	NA	NA	NA	6.5	30	3.9	24	NA	NA	<6.3	<18	<16	34	<0.96	NA	NA	<3.4	NA	NA
	8/23/2004	NA	NA	NA	NA	NA	NA	7.0	31	<0.79	36	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<3.2	NA	NA
	11/18/2004	NA	NA	NA	NA	NA	NA	5.1	27	<0.79	35	NA	NA	<6.3	<18	<16	35	<0.96	NA	NA	<3.2	NA	NA
	5/5/2005	NA	NA	NA	NA	NA	NA	9.0	38	<0.79	39	NA	NA	<6.3	<18	<16	37	1.6 ^J	NA	NA	<3.2	NA	NA
	5/19/2006	NA	NA	NA	NA	NA	NA	<10	28 ^J	0.93 ^J	37	NA	NA	<6.3	<18	<16	35	<0.96	NA	NA	<3.2	NA	NA
	5/30/2007	NA	NA	NA	NA	NA	NA	4.3	190	<1.0	41	NA	NA	<6.3	<18	<16	36	1.6 ^J	NA	NA	<3.2	NA	NA
	4/16/2008	NA	NA	NA	NA	NA	NA	6.0	20	<0.43	41	NA	NA	<6.3	<18	<16	36	<0.96	NA	NA	<1.44	NA	NA
	4/3/2009 Dup	NA	NA	NA	NA	NA	NA	5.9	24	0.29 ^J	46	NA	NA	<0.12	1.2 ^B	150 ^J	37	0.77	NA	NA	0.43	NA	NA
	4/3/2009	NA	NA	NA	NA	NA	NA	5.9	24	0.29 ^J	46	NA	NA	0.15 ^J	0.9 ^B	<150	37	0.83	NA	NA	0.45 ^B	NA	NA
	4/21/2010	NA	NA	7.49	12.3	605	NA	5.89	24.8	<1.0	39.4	<100	NA	2.67 ^J	<20	<100	36.6	<10	NA	NA	<5.0	NA	NA
	5/4/2011	NA	NA	7.42	10.3	640	NA	6.72	24.4	<1.0	43.9	<100	NA	<1.55	<20	<100	39.2	<10	NA	NA	<5.0	NA	NA
	4/25/2012	NA	NA	7.38	13.2	602	NA	5.35	21.1	<1.0	44	<100	NA	<1.55	<20	<100	40.5	<10	NA	NA	<5.0	NA	NA
	4/2/2013	NA	NA	7.05	11.8	579	314	8.2	23.4	<1.0	37	<100	66.7	<5.0	<10	<50	39.6	1.69	<5.0	1.2	<1.0	5.2	65
	7/2/2013	NA	NA	7.30	11.1	628	298	8.2	24.8	<1.0	43	<100	66.1	<5.0	<10	<50	38.1	1.24	<5.0	1.1	<1.0	4.5	61
	4/29/2014	5.61	-28	7.11	11.3	583	327	8.0	24.2	0.55 ^J	47	<50	67.4	<0.79	3.5 ^J	<24	35.6	<2.5	<0.95	0.64	0.6 ^J	4.8	83
	4/20/2015	NA	NA	7.22	11.0	544	311	6.6	23.8	<0.25	45 ^{D9}	23 ^J	70.6 ^{D9}	<0.10	2.2 ^J	12 ^J	38.4 ^{D9}	<2.4	2.7 ^J	1.1	0.40 ^J	4.5 ^{D9}	67 ^{D9}
	4/29/2016	7.7	243.7	7.64	9.7	596.2	377	7.6	24	0.26 ^J	44.2	<50.0	68.5	<0.50	0.17 ^{JB}	<12.8	37.6	1.5 ^B	<0.27	1.01	0.46 ^J	4.61	60.7 ^{N2}
	4/19/2017	7.1	321	7.48	10.3	589	293	6.3	25.4	0.27 ^J	45.7	32.0 ^{JB}	67.2	0.047 ^{JB}	0.21 ^{JB}	27.1 ^{JB}	37.9	1.88 ^B	0.50 ^{JB}	1.02	0.46 ^J	4.87	61.2 ^{N2}
	4/16/2018	10.7	290	7.4	9.2	617	311	6.7	26.4	0.19 ^J	44.9	23.8 ^J	67.5	<0.014	0.25 ^{JB}	<9.6	36.8	0.28 ^J	0.30 ^J	1.10	0.24 ^J	4.65	63.8 ^{N2}
	Avg prev 2 yrs	--	--	7.56	10.0	593	335	--	--	--	--	32.0	67.9	--	--	--	37.8	--	0.50	1.02	--	4.7	--
	Result > 2-yr avg?			N	N	Y	N					N	N				N		N	Y		N	
MW11	3/8/2002	NA	NA	NA	NA	NA	NA	15	380	23	470	NA	NA	<11	<9.1	28,000	62	1,900	NA	NA	0.87	NA	NA
	5/26/2004	NA	NA	NA	NA	NA	NA	17	160	16	180	NA	NA	17	<18	11,000	53	9,500	NA	NA	<3.2	NA	NA
	8/23/2004	NA	NA	NA	NA	NA	NA	16	190	3.8	130	NA	NA	18	<18	410	68	10,000	NA	NA	<3.2	NA	NA
MW11R	4/21/2010	NA	NA	6.84	12.4	1,565	NA	31.6	16.7	2.44	367	188	NA	9.08 ^J	<20	1,690	88.2	3,580	NA	NA	<5.0	NA	NA
	5/4/2011	NA	NA	6.91	13.3	1,787	NA	16.1	<2.00 ^{RL}	11.6	410	210	NA	5.24 ^J	23.6	27,900	109	4,950	NA	NA	<5.0	NA	NA
	4/25/2012	NA	NA	6.73	12.6	1,844	NA	12.3	<5.00	13.6	518	272	NA	7.55 ^J	<20	55,600	119	4,560	NA	NA	<5.0	NA	NA
	4/25/2012 (Dup)	NA	NA	6.73	12.6	1,844	NA	12.6	<5.00	15.7	512	272	NA	7.3 ^J	<20	56,500	120	4,560	NA	NA	<5.0	NA	NA

Table 3. Historical Groundwater Analytical Results Summary
Alliant-Lansing CCR Landfill / SCS Engineers Project #25216070.18
(Results are in µg/L, unless otherwise noted)

Sample	Date	DO, Field (mg/L)	Redox, Field (mV)	pH, Field (SU)	Temp., Field (deg C)	Specific Conduc- tance, Field (µS/cm)	Alkalinity, Total As CaCO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Barium (µg/L)	Boron (µg/L)	Calcium (mg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Magnesium (mg/L)	Manganese (µg/L)	Nickel (µg/L)	Potassium (mg/L)	Selenium (µg/L)	Sodium (mg/L)	Strontium (µg/L)
MW11R (continued)	4/2/2013	NA	NA	7.15	11.8	1,370	882	12.5	<1.0	<u>25</u>	490	220	180	<u>7.0</u>	<10	<u>52,800</u>	110	<u>4,200</u>	<5.0	7.6	<1.0	<u>24.6</u>	500
	7/2/2013	NA	NA	7.00	11.2	1,688	1,020	12.5	<1.0	<u>23</u>	490	230	181	<u>7.5</u>	<10	<u>55,200</u>	110	<u>3,700</u>	6.8	7.9	<1.0	<u>24.5</u>	480
	4/30/2014	0.45	-96	7.08	10.5	1,611	997	12.7	0.52 J	<u>27</u>	460	210	174	<u>7.1</u>	1.5 J	<u>57,100</u>	101	<u>3,200</u>	3.3 J	6.0	0.42 J	<u>26.1</u>	470
	5/29/2014	0.66	-103	7.6	12.1	890	893	12.6	0.48 J	<u>27</u>	470	190	184	<u>8.1</u>	1.4 J	<u>58,500</u>	107	<u>3,200</u>	5.4	7.3	0.35 J	<u>25.2</u>	490
	4/21/2015	NA	NA	7.09	10.2	1,303	1,040	12.3	0.38 J	<u>23</u>	430	210	179 MI	<u>5.3</u>	1.1 J	<u>56,000</u>	111	<u>3,200</u>	4.8 J	5.3	0.41 J	<u>27.4</u>	440
	4/28/2016	0.07	-146.9	7.15	10.3	1,766	910	13.4	0.38 J	<u>33.4</u>	503	231	182	<u>8.2</u>	0.94 JB	<u>59,000</u>	113	<u>3,040</u>	6.7	6.87	0.63 J	<u>23.1</u>	460 N2
	4/20/2017	0	-166	6.95	10.6	1,863	975	13.5	<1.0	<u>30.4</u>	562	296	186	<u>8.0</u>	5.8	<u>65,800</u>	117	<u>2,940</u>	7.7	7.72	0.59 J	<u>24.7</u>	492 N2
	4/17/2018	0.3	-153	6.96	10.3	1,769	1020	13.3	0.39 J	<u>28.5</u>	485	236	170 MI	<u>5.9</u>	3.4	<u>54,400</u>	103 MI	<u>2,630</u>	4.8	6.88	0.44 J	<u>25.9</u>	473 N2
	Avg prev 2 yrs	--	--	7.05	10.5	1815	943	--	--	--	--	264	184	--	--	--	115	--	7.2	7.30	--	23.9	--
	Result > 2-yr avg?			N	N	N	Y					N	N				N		N	N		Y	
MW12	4/2/2013	NA	NA	7.43	12.0	875	422	6.9	125	<u>16</u>	220	1,300	77.7	<5.0	<10	<u>2,200</u>	41.9	<u>1,700</u>	5.4	3.1	<1.0	<u>103</u>	100
	7/2/2013	NA	NA	7.24	11.3	937	440	6.9	132	<u>17</u>	230	1,200	77.7	<5.0	<10	<u>3,400</u>	41.6	<u>1,400</u>	7.9	2.9	<1.0	<u>99.1</u>	89
	4/30/2014	0.69	-85	7.22	11.0	1,002	485	5.8	160	<u>16</u>	260	1,300	77.6	1.9 J	3.1 J	<u>4,200</u>	38.3	<u>1,300</u>	4.2 J	2.2	<0.23	<u>108</u>	89
	5/29/2014	0.58	-85	7.4	13.1	730	421	6.0	145	<u>14</u>	280	1,300	86.1	2.1 J	1.3 J	<u>6,300</u>	41.3	<u>1900</u>	5.3	4.1	<0.23	<u>96.3</u>	120
	4/21/2015	NA	NA	7.22	11.3	889	452	4.9	159	<u>13</u>	260	1,200	81.6	1.8	1.4 J	<u>6,600</u>	39.2	<u>1,500</u>	4.6 J	3.1	<0.12	<u>97.2</u>	97
	4/28/2016	0.10	-130.3	7.47	10.7	1,054	409	5.3	155	<u>24.2</u>	251	1,270	77	1.6	0.97 JB	<u>8,320</u>	38.4	<u>1,080</u>	4.7	2.67	<0.18	<u>101</u>	83.9 N2
	4/20/2017	0.50	-152	7.18	11.2	976	414	5.9	146	<u>19.4</u>	259	1,420	79.5	2.2	1.7	<u>11,500</u>	41.6	<u>1,360</u>	5.1	3.28	0.13 J	<u>101</u>	94.2 N2
	4/17/2018	0.1	-148	7.2	10.9	1,052	407	4.8	170	<u>20.6</u>	251	1,300	73.7	1.9	5.7	<u>9,190</u>	36.6	<u>1,080</u>	5.4	3.06	<0.086	<u>103</u>	90.6 N2
	Avg prev 2 yrs	--	--	7.33	11.0	1015	412	--	--	--	--	1235	78	--	--	--	40.0	--	4.9	3.0	--	101	--
	Result > 2-yr avg?			N	N	Y	N					Y	N				N		Y	Y		Y	
MW12P	4/30/2014	0.56	79	7.28	10.9	947	467	29.3	126	1.0	94	1,400	120	1.6 J	2.5 J	<24	52.2	<u>590</u>	2.7 J	1.3	2.2	<u>23.5</u>	120
	5/29/2014	0.75	127	7.6	13.0	730	548	23.9	161	0.45 J	100	1,800	130	<0.79	<0.85	<24	55.1	<u>430</u>	3.7 J	1.9	2.4	<u>31.7</u>	120
	4/21/2015	NA	NA	7.05	10.5	928	478	36.2	145	0.34 J	96	1,600	141	0.37 J	1.6 J	12 J	61.1	41	1.2 J	1.7	2.5	<u>22.9</u>	130
	4/28/2016	4.82	290.1	7.25	10.6	1,025	391	49.7	84.1	0.44 J	82.2	1,240	123	0.7 J	0.58 JB	250	53.8	13.7	0.74 J	1.57	1.7	19.9	104 N2
	4/20/2017	2.9	183	7.19	10.8	1,028	354	11.5	214	0.88 J	102	2,750	129	1.3	2.3	<u>2,370</u>	56.5	<u>96.9</u>	2.6	2.36	4.1	<u>34.8</u>	107 N2
	4/17/2018	1.1	264	7.13	10.6	1,295	384	9.1	<u>378</u>	0.51 J	103	3,510	143	0.96 J	1.7	<u>1,270</u>	58.8	<u>84.8</u>	1.7	2.56	3.7	<u>54.5</u>	130 N2
	Avg prev 2 yrs	--	--	7.22	10.70	1027	373	--	--	--	--	1995	126	--	--	--	55.2	--	1.7	2.0	--	27.4	--
	Result > 2-yr avg?			N	N	Y	Y					Y	Y				Y		Y	Y		Y	
MW13	4/2/2013	NA	NA	7.87	11.1	363	95	22.1	60.2	1.1	46	1,200	46.0	<5.0	<10	<50	7.8	<u>21</u>	<5.0	3.7	2.6	16.6	800
	7/2/2013	NA	NA	7.33	11.2	853	273	12.1	79.1	<1.0	64	1,600	78.3	<5.0	<10	<50	29.6	6.5	<5.0	2.1	4.5	16.2	610
	7/2/2013 Dup	NA	NA	NA	NA	NA	268	12.7	78.1	<1.0	64	1,500	76.9	<5.0	<10	<50	29.4	7.3	<5.0	2.1	4.4	16.3	610
	4/30/2014	1.96	73	7.56	8.1	504	132	20.7	73.0	1.6	36	1,300	41.6	<0.79	2.5 J	52	7.5	<u>17</u>	<0.95	2.5	1.7	18.6	730
	5/29/2014	2.46	145	8.2	9.3	370	256	18.5	85.2	0.65 J	49	1,200	74.2	<0.79	<0.85	<24	15.8	3.3 J	<0.95	2.8	6.5	17.8	1,200
	4/20/2015	NA	NA	7.77	8.7	348	151	17.9	62.9	1.1	28	1,200	39.5	<0.10	1.3 J	<9.0	5.7	15	1.4 J	3.1	1.3	15.8	970
	4/28/2016	1.08	154.9	<u>9.05</u>	10.1	350.3	60.2	19	81.1	3.5	46.4	1,410	47	1.9	5.1	<u>3,760</u>	7.49	<u>70.4</u>	4.8	4.41	1.5	18.7	975 N2
	4/20/2017	6.1	320	7.23	9	758	355	5.7	71.5	1.5	83.8	1,160	106	<u>2.9</u>	6.6	<u>5,100</u>	47.6	<u>257</u>	6.4	2.04	3.6	16.7	268 N2
	4/17/2018	2.8	9	7.38	7.7	621	154	18.7	114	0.89 J	50.5	922	70.8	<u>1.7</u>	3.6	<u>2,010</u>	22.5	<u>160</u>	3.2	2.04	3.6	12.8	897 N2
	Avg prev 2 yrs	--	--	8.14	9.55	554	208	--	--	--	--	1285	77	--	--	--	27.5	--	5.6	3.2	--	17.7	--
	Result > 2-yr avg?			N	N	Y	N					N	N				N		N	N		N	

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Alliant-Lansing CCR Landfill / SCS Engineers Project #25216070.18
(Results are in µg/L, unless otherwise noted)

Sample	Date	DO, Field (mg/L)	Redox, Field (mV)	pH, Field (SU)	Temp., Field (deg C)	Specific Conduc- tance, Field (µS/cm)	Alkalinity, Total As CaCO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Barium (µg/L)	Boron (µg/L)	Calcium (mg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Magnesium (mg/L)	Manganese (µg/L)	Nickel (µg/L)	Potassium (mg/L)	Selenium (µg/L)	Sodium (mg/L)	Strontium (µg/L)
MW14	4/2/2013	NA	NA	7.65	10.6	536	312	9.0	23.5	<1.0	43	<100	65.7	<5.0	<10	<50	37.6	<5.0	<5.0	1.2	<1.0	4.1	67
	7/2/2013	NA	NA	7.56	10.8	593	283	8.2	22.1	<1.0	39	<100	63.8	<5.0	<10	<50	36.8	<5.0	<5.0	1.2	<1.0	3.9	60
	4/30/2014	4.65	141	7.59	9.0	550	336	6.9	20.8	0.54 J	41	<50	65.3	<0.79	2.3 J	310	33.0	17	<0.95	0.69	0.63 J	3.4	65
	5/29/2014	4.41	132	7.8	13.2	430	320	6.6	20.0	<0.18	38	<50	69.0	<0.79	<0.85	<24	35.6	<2.5	<0.95	1.2	<0.23	3.5	63
	4/20/2015	NA	NA	7.57	9.5	517	315	6.3	20.2	<0.25	37	17 J	65.5	<0.10	1.3 J	9.3 J	34.8	<2.4	1.4 J	1.0	0.44 J	3.3	61
	4/29/2016	5.35	227.9	7.73	9.9	563.1	261	6.1	21.5	0.16 J	38.2	<50.0	66.7	<0.50	0.42 JB	226	35.2	12.6	0.42 J	1.06	0.48 J	3.14	58.3 N2
	4/20/2017	8.1	307	7.58	9.9	586	284	8.0	25.7	0.68 J	49.8	57.3 J	75.8	1.4	2.3	2,040	41.3	71.7	2.6	1.52	0.54 J	5.22	63.8 N2
	4/17/2018	5.9	254	7.46	9.6	627	301	10.3	30.3	0.16 J	40.6	75.0 J	69.1	0.39 J	0.51 JB	285	36.6	25.8	0.67 J	1.21	0.34 J	6.34	61.6 N2
	Avg prev 2 yrs	--	--	7.66	9.90	575	273	--	--	--	--	53.7	71.3	--	--	--	38.3	--	1.5	1.3	--	4.18	--
	Result > 2-yr avg?			N	N	Y	Y					Y	N				N		N	N		Y	
MW15	4/30/2014	2.69	163	7.66	7.3	498	237	22.9	40.8	0.95 J	170	250	55.3	0.91 J	3.7 J	200	17.6	130	0.97 J	2.1	2.8	16.5	480
	5/29/2014	5.24	149	7.7	7.8	370	187	19.2	42.4	0.82 J	150	330	51.5	<0.79	<0.85	<24	16.5	130	0.98 J	2.4	5.2	16.4	440
	4/20/2015	NA	NA	7.83	8.2	416	198	19.9	32.6	0.79 J	160	250	55.6	<0.10	1.3 J	22 J	15.8	71	1.1 J	3.1	4.7	12.8	480
	4/29/2016	6.38	225.4	7.88	6.5	442.8	149	16.8	37.7	0.39 J	111	97.1 J	50.1	<0.50	0.96 JB	64.8	17.5	11.1	0.44 J	1.84	1.8	13.3	419 N2
	4/20/2017	6.8	319	7.65	6.2	492	197	13.9	39.8	0.42 J	139	116	61.6	0.16 JB	0.87 JB	94.5 B	20.2	82.1	0.62 JB	1.58	4.5	11	454 N2
	4/17/2018	5.7	207	7.54	5.3	491	190	22.9	34.6	0.14 J	110	86.5 J	53.8	0.066 JB	0.70 JB	13.4 J	20.4	9.1	0.46 J	1.50	1.1	13.4	364 N2
	Avg prev 2 yrs	--	--	7.77	6.35	467	173	--	--	--	--	107	56	--	--	--	18.9	--	0.5	1.7	--	12.2	--
	Result > 2-yr avg?			N	N	Y	Y					N	N				Y		N	N		Y	
TW17	4/30/2014	2.95	98	7.48	8.7	645	364	14.7	44.0	0.87 J	55	180	74.4	1 J	2.6 J	180	38.2	150	2.10 J	0.47 J	0.84 J	15.5	80
	5/29/2014	4.74	153	7.3	8.7	510	324	14.6	41.2	0.25 J	43	150	78.4	<0.79	<0.85	<24	40.1	3.5 J	<0.95	1.1	0.67 J	12.6	73
TW18	4/30/2014	1.49	23	7.30	6.3	848	382	78.9	24.6	1.40	130	220	99.2	2.6 J	2.3 J	68	40.6	860	2.9 J	1.7	0.61 J	37.4	160
	5/29/2014	4.08	143	7.4	8.5	540	335	27.5	29.0	<0.18	48	66 J	82.7	<0.79	<0.85	<24	42.5	10	<0.95	1.3	0.96 J	8.6	78
	4/20/2015	NA	NA	7.08	7.1	778	458	99.3	21.6	0.47 J	120	260	114	2.0	1.9 J	230	47.0	920	4.5 J	2.1	0.39 J	48.0	170
	4/20/2017	8.1	287	7.23	7.4	772	354	41.6	15.5	1.2	73.6	97.6 J	88.4	0.44 J	0.84 JB	1,090	41.5	227	1.1 B	1.43	0.76 J	22.0	101 N2
	4/17/2018	2.9	280	7.17	6.5	751	353	36.9	22.7	2.1	88.4	71.2 J	82.0	1.4	2.2	3,980	40.3	897	3.1	1.59	0.51 J	18.4	85.6 N2
	Avg prev 2 yrs	--	--	7.16	7.25	775	406	--	--	--	--	--	101	--	--	--	44.3	--	--	1.8	--	35.0	--
	Result > 2-yr avg?			Y	N	N	N						N				N			N		N	
TW19	4/30/2014	0.23	-63	7.12	6.8	1165	381	163	7.9	4.6	340	110	106	2.6 J	2.8 J	5,500	35.4	1,600	4.2 J	2.5	<0.23	99.5	200
	5/29/2014	2.32	120	7.5	8.8	500	305	23.2	19.5	0.59 J	95	<50	76.4	<0.79	<0.85	33 J	40.1	660	1.9 J	1.2	<0.23	6.4	75
Field Blank	4/2/2013	NA	NA	NA	NA	NA	<20.0	<1.0	<1.0	<1.0	<10	<100	<100	<5.0	<10	<50	<50	<5.0	<5.0	<0.50	<1.0	<0.50	<10
	7/2/2013	NA	NA	NA	NA	NA	<20.0	<1.0	<1.0	<1.0	<10	<100	<100	<5.0	<10	<50	<50	<5.0	<5.0	<0.50	<1.0	<0.50	<10
	4/30/2014	NA	NA	NA	NA	NA	<1.9	<0.50	<0.056	<0.18	<0.61	<50	<7.8	<0.79	1.2 J	<24	<0.017	<2.5	<0.95	<0.048	<0.23	<0.25	<5
	5/29/2014	NA	NA	NA	NA	NA	<1.9	<0.50	<0.056	<0.18	<0.61	<50	<7.8	<0.79	<0.85	<24	<0.017	<2.5	<0.95	0.068 J	<0.23	<0.25	<5
	4/21/2015	NA	NA	NA	NA	NA	<2.0	<0.50	<0.24	<0.25	<0.52	<3.1	0.03 J	<0.10	<0.83	<9.0	<0.013	<2.4	<0.56	<0.059	<0.12	<0.25	<0.28
	4/29/2016	NA	NA	NA	NA	NA	6.6 J	<0.50	<0.25	<0.10	<0.14	<50.0	0.01 J	<0.50	<0.11	<12.8	<0.0158	<0.19	<0.27	<0.129	<0.18	<0.0207	0.15 J, N2
	4/20/2017	NA	NA	NA	NA	NA	7.3 J	<1.0	<1.0	<1.0	0.69 JB	<100	0.05 J	<1.0	0.21 JB	18.4 JB	<0.050	0.25 JB	0.26 JB	<0.500	<1.0	0.335 JB	0.19 JB, N2
	4/17/2018	NA	NA	NA	NA	NA	<4.9	<0.46	<0.24	<0.052	0.42 JB	<12.5	<0.054	<0.014	0.20 JB	<9.6	<14.0	0.13 J	0.28 J	<0.0793	<0.086	<0.157	<0.071

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Sample	Date	DO, Field (mg/L)	Redox, Field (mV)	pH, Field (SU)	Temp., Field (deg C)	Specific Conduc- tance, Field (µS/cm)	Alkalinity, Total As CaCO3 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Barium (µg/L)	Boron (µg/L)	Calcium (mg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Magnesium (mg/L)	Manganese (µg/L)	Nickel (µg/L)	Potassium (mg/L)	Selenium (µg/L)	Sodium (mg/L)	Strontium (µg/L)
USEPA MCL (Health)		NE	NE	NE	NE	NE	NE	NE	NE	10	2,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	50	NE	NE
USEPA SMCL (Aesthetic)		NE	NE	6.5-8.5	NE	NE	NE	250	250	NE	NE	NE	NE	NE	1,000	300	NE	50	NE	NE	NE	NE	NE
USEPA Drinking Water Advisory (Health) ⁽²⁾		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	20	NE
USEPA Health Advisory Level (Lifetime) ⁽²⁾		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	6,000	NE	NE	NE	NE	NE	300	100	NE	50	NE	4,000
Iowa Statewide Standard for a Protected Groundwater Source ⁽²⁾		NE	NE	NE	NE	NE	NE	NE	NE	10	2,000	6,000	NA	2.8	1,300	NA	NA	300	100	NA	50	NA	4,000
Upgradient mean + 2 std dev ⁽¹⁾		NC	NC	7.71	NA	653	375	9.5	106	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Upgradient mean - 2 std dev ⁽¹⁾		NA	NA	6.99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviations:
µg/L = micrograms per liter
mg/L = milligrams per liter
NC = Not Calculated due to limited background data

DUP = Duplicate sample
NA = Not Applicable
NE = No Standard Established

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Limit
USEPA SMCL = United States Environmental Protection Agency Secondary Maximum Contaminant Limit
mV = millivolts

Notes:
Historical results for Alkalinity(bicarbonate), aluminum, antimony, cadmium, chromium, lead, lithium, mercury, molybdenum, thallium, vanadium, and zinc are not included in this summary. These parameters are no longer monitored at the site. All historical data for these parameters were included in the 2017 Annual Water Quality Report.

(1) The calculated upgradient mean ±2 standard deviations is based on data reported at upgradient well MW-6. Where non-detects were included in the calculations, they were assigned a result equal to the detection limit. Duplicate results are not included in the calculations.

(2) Listed USEPA Drinking Water Advisory, USEPA Health Advisory Level, and Iowa Statewide Standard values are included as requested by IDNR in a letter dated November 14, 2013. Health Advisory Levels shown here are lifetime values for non-carcinogens.

(3) Average of last two years is calculated for parameters that do not have an MCL or HAL, if more than on value is available to calculate the average. Non-detect values were assumed equal to the detection limit for calculating the average.

Bold+underlined values meet or exceed USEPA MCL, USEPA SMCL, USEPA Drinking Water Advisory, USEPA Health Advisory Level, or DNR Statewide Standard.

Shade: values meet or exceed the upgradient mean ± 2 standard deviations.

Laboratory Notes/Qualifiers:
B = Analyte was detected in the associated Method Blank.
CL = The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
D = Diluted for analysis.
D9 = Dissolved result is greater than the total. Data is within laboratory control limits.
H1 = Analysis conducted outside the EPA method holding time.
J = Estimated value. Analyte detected at a level less than the reporting limit and greater than or equal to the Method Detection Limit. The user of this data should be aware that this data is of unknown quality.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2 = The lab does not hold TNI accreditation for this parameter.
RL1 = Reporting limit raised due to sample matrix effects.

Created by: TLC Date: 8/20/2013

Last revision by: MDB Date: 10/4/2018

Checked by: AJR Date: 10/4/2018

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Appendix D

Statistical Evaluation of Groundwater Monitoring Results

November 30, 2023
File No. 25223070.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results
Lansing Power Station CCR Landfill, April 2023

PREPARED BY: Ryan Matzuk

CHECKED BY: Charles Hostetler 9/26/2023

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. Monitoring well MW-6 is used as the background well. The statistical program used to calculate the interwell prediction interval is Sanitas™ (Version 9.6.37).

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**. For metals, the time series plots only show monitoring results since April 2016, when the monitoring program transitioned from dissolved metals to total metals analysis. For chloride, sulfate, and total alkalinity, which are not typically affected by filtering, older historical results for background well MW-6 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 well MW-6. 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 U.S. EPA's 1989 Outlier Test to identify suspected outliers.
 - a) If number of background samples is less than or equal to 22, run Dixon's test for suspected outliers.
 - b) If number of background samples is more than 22, 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.

In the review of the interwell background data collected from MW-6 through the April 2023 sampling event, the following background values from MW-6 were identified as potential outliers and handled as described:

- **Chloride.** Three non-detect results from May 2001 to February 2004 and one from May 2006 were removed based on visual inspection of the data. These results included the first three rounds of samples from MW-6 and were inconsistent with subsequent results. These four results were identified as outliers in the previous Annual Water Quality Report and were excluded from the dataset for the current outlier evaluation. No additional chloride outliers were identified.
- **Sulfate.** One high result from May 2007 was previously identified as an outlier and was removed based on visual inspection of the data. The outlier analysis was rerun with the May 2007 result removed, and one additional high result from May 2005 was flagged as a statistical outlier. This result was kept in the database 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 sulfate concentrations.

Outlier analysis results are included in **Attachment D2**.

INTERWELL PREDICTION LIMITS

Interwell prediction limits are calculated using background data from MW-6 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 Quantification 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 2023 event, the following values were used:

Parameter	Value	Comments
Evaluations per year	1	April event
Constituents analyzed	17	Total of 17 constituents analyzed
Compliance wells	7	Total of 7 compliance wells analyzed

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 constituents with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule can be used in place of a calculated Upper Prediction Limit (UPL), and 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 quantification limit. For the Lansing site, all of the required sampling parameters were detected at least once in the background well samples, so UPLs were calculated for all parameters; however, only results that exceed both the UPL and the quantification limit can be considered to be SSIs. 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 represented 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 2023 are included in **Attachment D3**.

RM/lmh/CJH

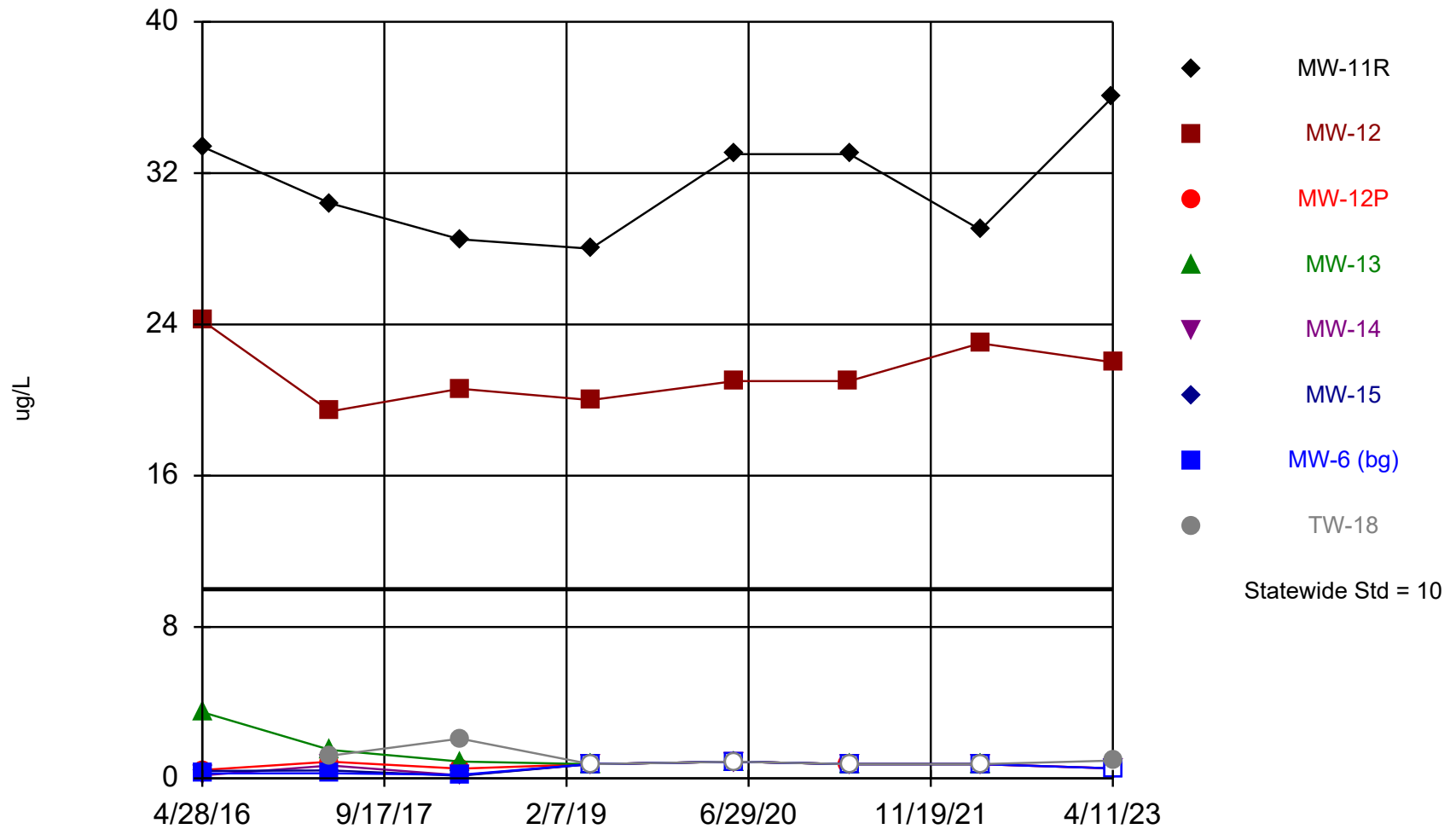
Encl. Attachments D1 through D3

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Attachment D1

Times Series Graphs

Arsenic



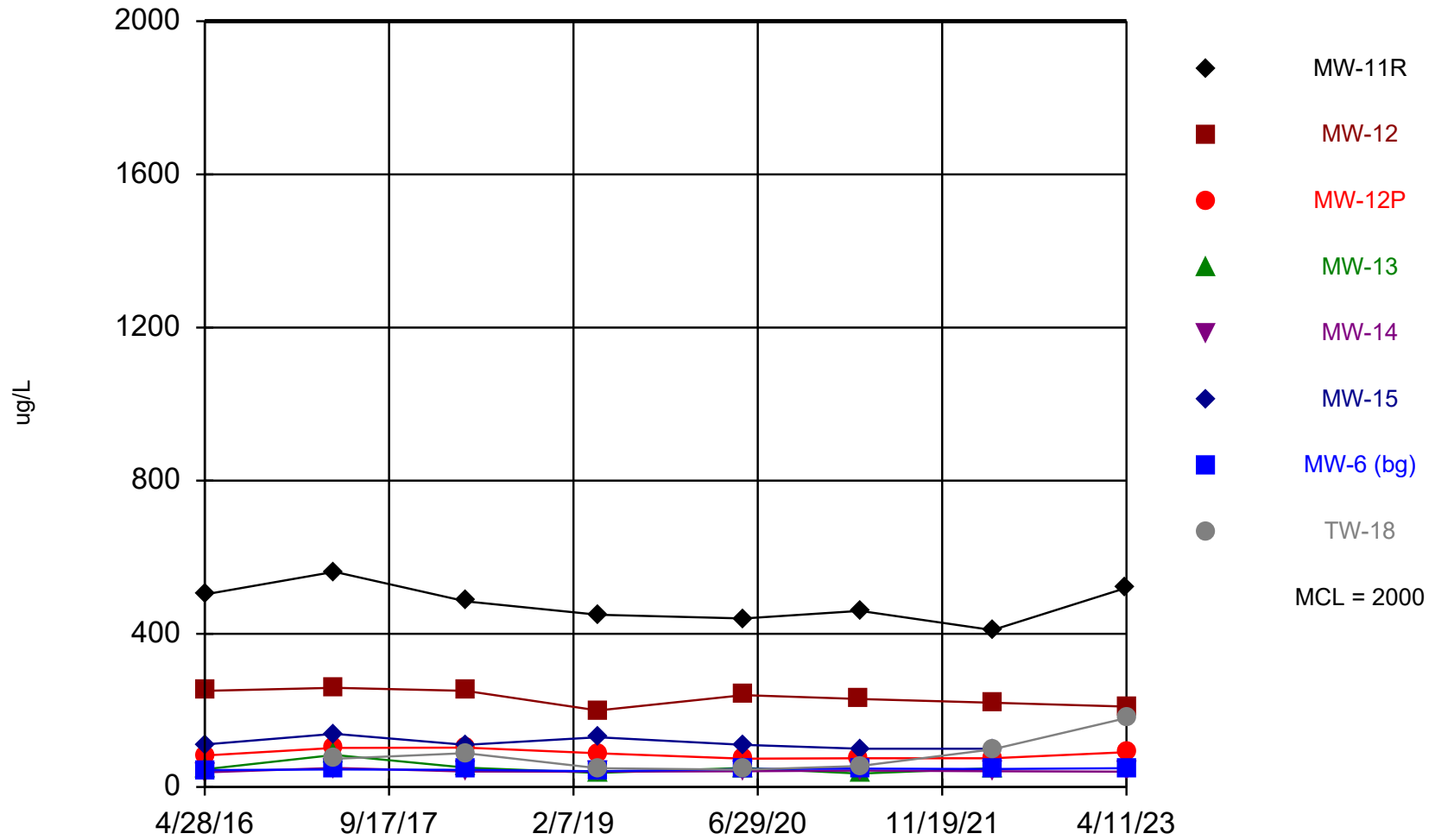
Time Series Analysis Run 7/13/2023 3:00 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Arsenic (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	33.4	24.2	0.44 (J)	3.5				
4/29/2016					0.16 (J)	0.39 (J)	0.26 (J)	
4/19/2017							0.27 (J)	
4/20/2017	30.4	19.4	0.88 (J)	1.5	0.68 (J)	0.42 (J)		1.2
4/16/2018							0.19 (J)	
4/17/2018	28.5	20.6	0.51 (J)	0.89 (J)	0.16 (J)	0.14 (J)		2.1
4/15/2019					<0.75		<0.75	
4/16/2019	28	20	<0.75	<0.75		<0.75		<0.75
5/20/2020							<0.88	
5/21/2020	33	21	<0.88	<0.88				
5/22/2020					<0.88	<0.88		<0.88
4/6/2021		21	<0.75					
4/7/2021	33			<0.75	<0.75	<0.75	<0.75	<0.75
4/6/2022		23	<0.75 (U)		<0.75 (U)		<0.75 (U)	<0.75 (U)
4/7/2022	29			<0.75 (U)		<0.75 (U)		
4/10/2023	36							
4/11/2023		22	<0.53 (U)		<0.53 (U)		<0.53 (U)	0.94 (J)

Barium



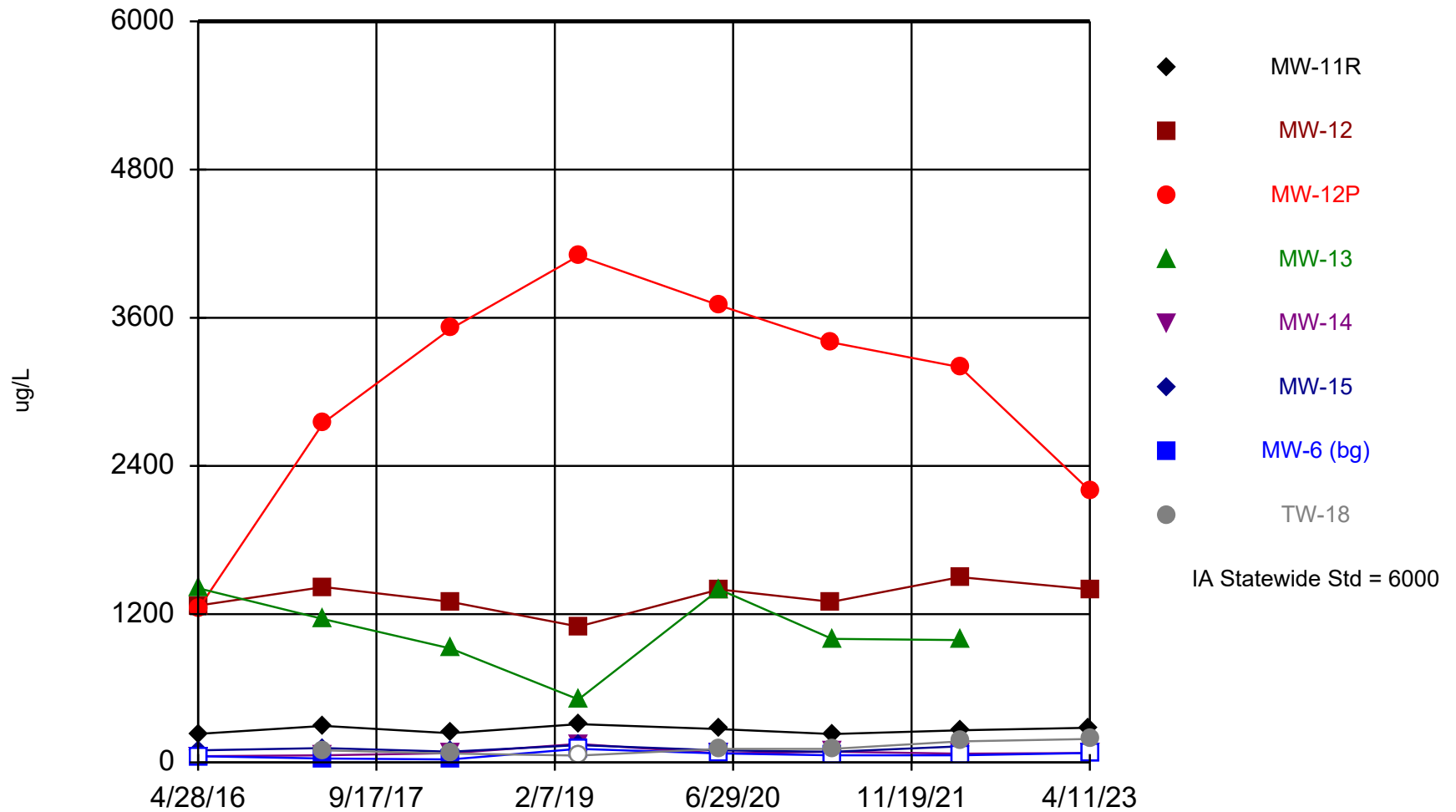
Time Series Analysis Run 7/13/2023 3:00 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Barium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	503	251	82.2	46.4				
4/29/2016					38.2	111	44.2	
4/19/2017							45.7	
4/20/2017	562	259	102	83.8	49.8	139		73.6
4/16/2018							44.9	
4/17/2018	485	251	103	50.5	40.6	110		88.4
4/15/2019					40 (B)		41 (B)	
4/16/2019	450 (B)	200 (B)	88 (B)	37 (B)		130 (B)		49 (B)
5/20/2020							47	
5/21/2020	440	240	74	50				
5/22/2020					41	110		45
4/6/2021		230	75					
4/7/2021	460			35	43	100	48	55
4/6/2022		220	75		41		47	98
4/7/2022	410			49		100		
4/10/2023	520							
4/11/2023		210	91		40		49	180

Boron



Time Series Analysis Run 7/13/2023 3:00 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

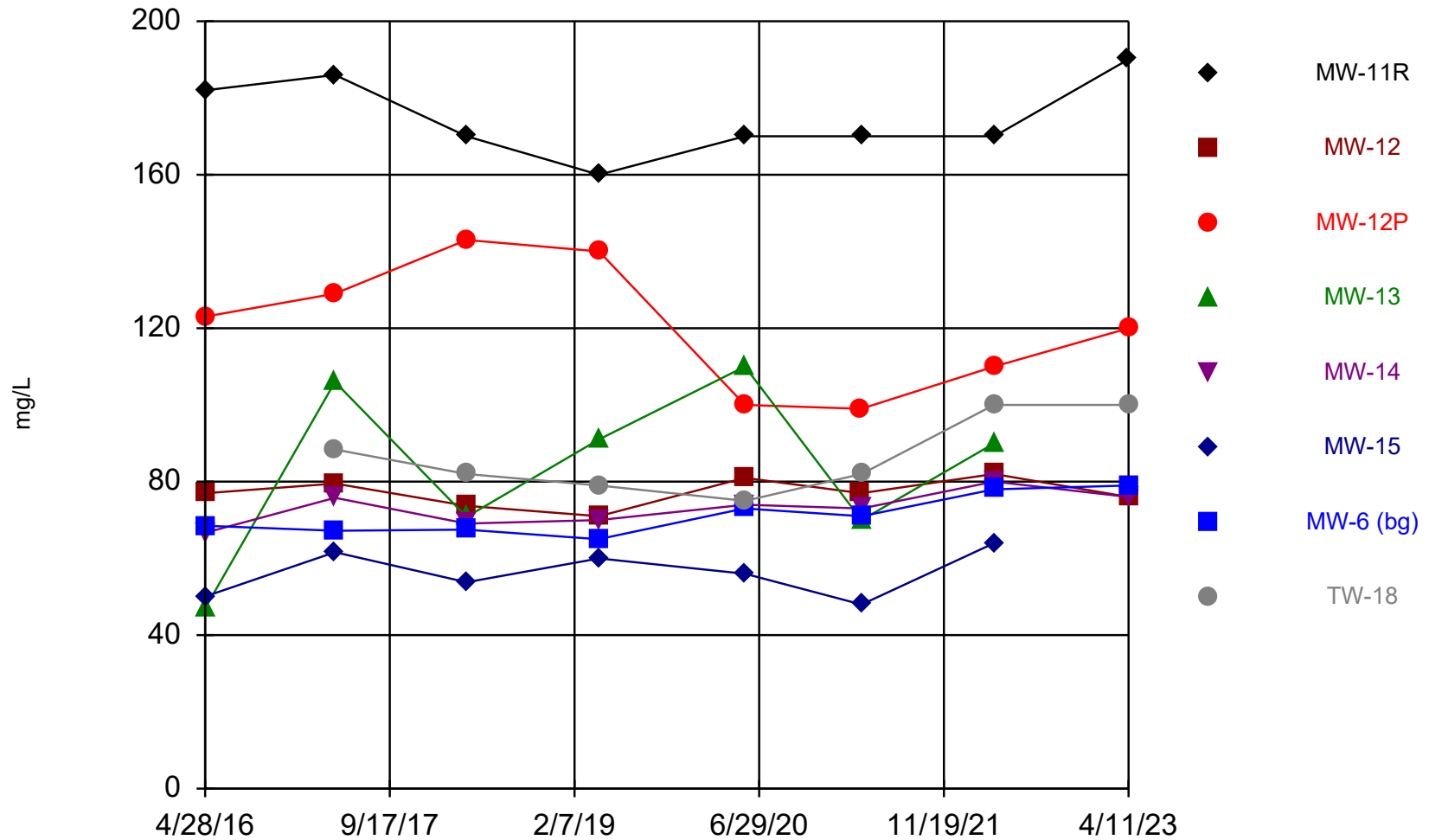
Time Series

Constituent: Boron (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	231	1270	1240	1410				
4/29/2016					<50	97.1 (J)	<50	
4/19/2017							32 (J,B)	
4/20/2017	296	1420	2750	1160	57.3 (J)	116		97.6 (J)
4/16/2018							23.8 (J)	
4/17/2018	236	1300	3510	922	75 (J)	86.5 (J)		71.2 (J)
4/15/2019					150 (J)		<110	
4/16/2019	310	1100	4100	510		140 (J)		<110
5/20/2020							<73	
5/21/2020	270	1400	3700	1400				
5/22/2020					<73	98 (J)		110
4/6/2021		1300	3400					
4/7/2021	230			1000	87 (J)	86 (J)	<58	110
4/6/2022		1500	3200		70 (J)		<58 (U)	170
4/7/2022	260			990		130		
4/10/2023	280							
4/11/2023		1400	2200		<76 (U)		<76 (U)	190

Calcium



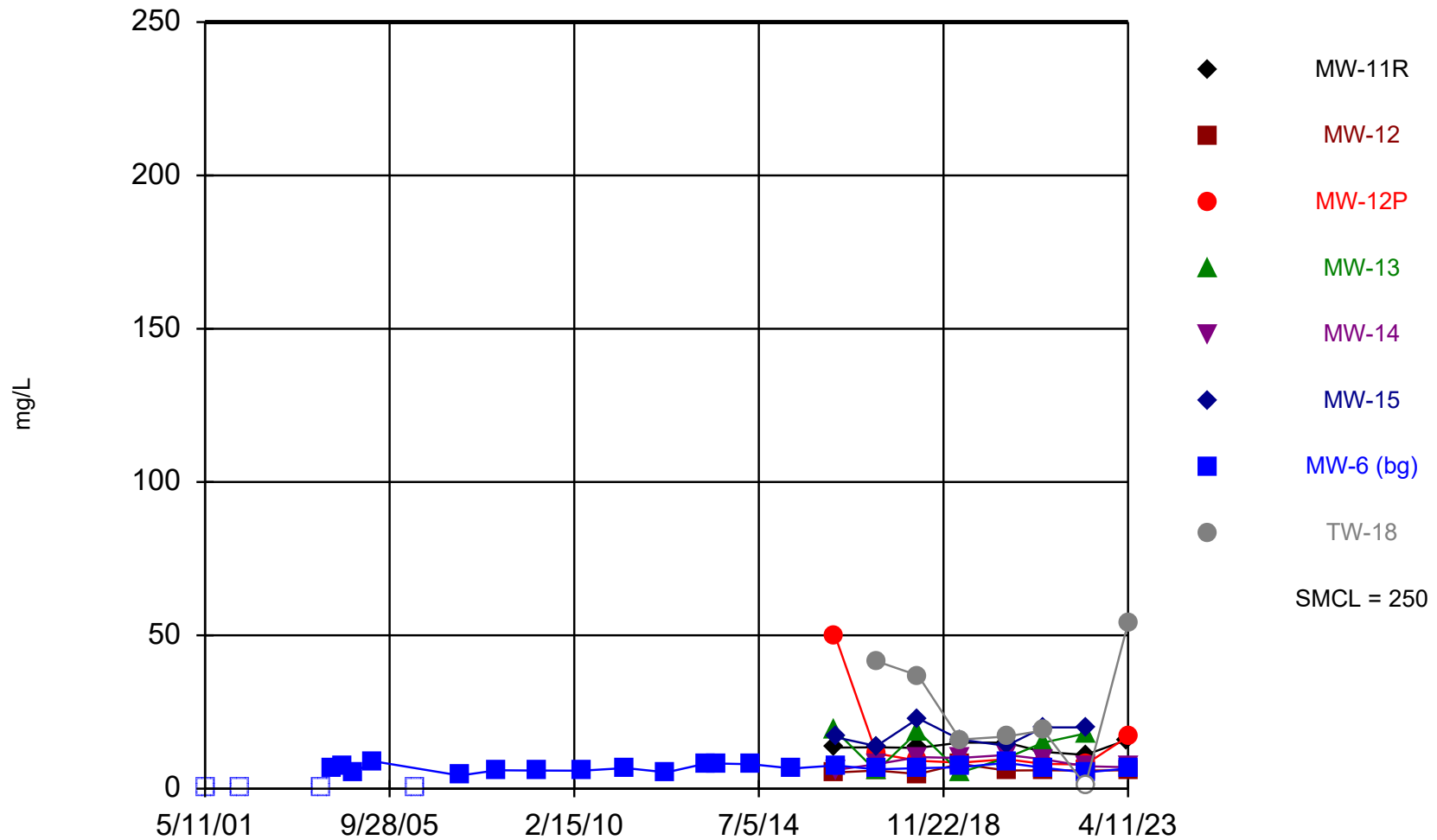
Time Series Analysis Run 7/13/2023 3:00 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Calcium (mg/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	182	77	123	47				
4/29/2016					66.7	50.1	68.5	
4/19/2017							67.2	
4/20/2017	186	79.5	129	106	75.8	61.6		88.4
4/16/2018							67.5	
4/17/2018	170 (M1)	73.7	143	70.8	69.1	53.8		82
4/15/2019					70		65	
4/16/2019	160	71	140	91		60		79
5/20/2020							73	
5/21/2020	170	81	100	110				
5/22/2020					74	56		75
4/6/2021		77	99					
4/7/2021	170			70	73	48	71	82
4/6/2022		82	110		80		78	100
4/7/2022	170			90		64		
4/10/2023	190							
4/11/2023		76	120		76		79	100

Chloride



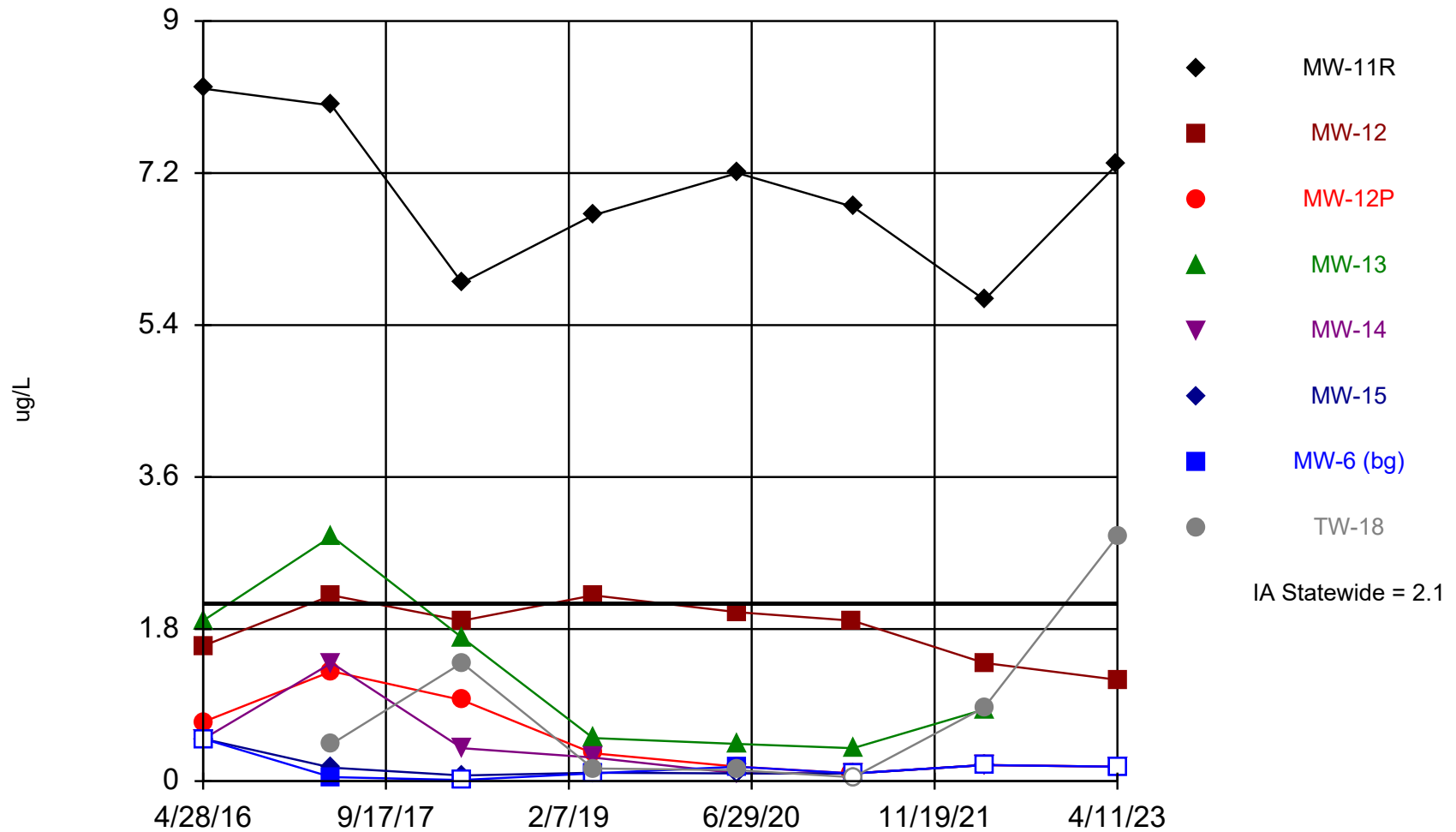
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Chloride (mg/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
5/11/2001							<0.5 (X)	
3/8/2002							<0.5 (X)	
2/19/2004							<0.5 (X)	
5/26/2004							6.5	
8/23/2004							7	
11/18/2004							5.1	
5/5/2005							9	
5/19/2006							<0.5 (X)	
5/30/2007							4.3	
4/16/2008							6	
4/3/2009							5.9	
4/21/2010							5.89	
5/4/2011							6.72	
4/25/2012							5.35	
4/2/2013							8.2	
7/2/2013							8.2	
4/29/2014							8	
4/20/2015							6.6	
4/28/2016	13.4	5.3	49.7	19				
4/29/2016					6.1	16.8	7.6	
4/19/2017							6.3	
4/20/2017	13.5	5.9	11.5	5.7	8	13.9		41.6
4/16/2018							6.7	
4/17/2018	13.3	4.8	9.1	18.7	10.3	22.9		36.9
4/15/2019					10		7	
4/16/2019	15	8.1	8.5	5.3		16		16
5/20/2020							8.4	
5/21/2020	15	5.9	9.6	10				
5/22/2020					11	14		17
4/6/2021		6	8.1					
4/7/2021	12			15	9.6	20	6.8	19
4/6/2022		5.9	7.9		7.3		5.3	<2.3 (U)
4/7/2022	11			18		20		
4/10/2023	16							
4/11/2023		6	17		7		6.6	54

Cobalt



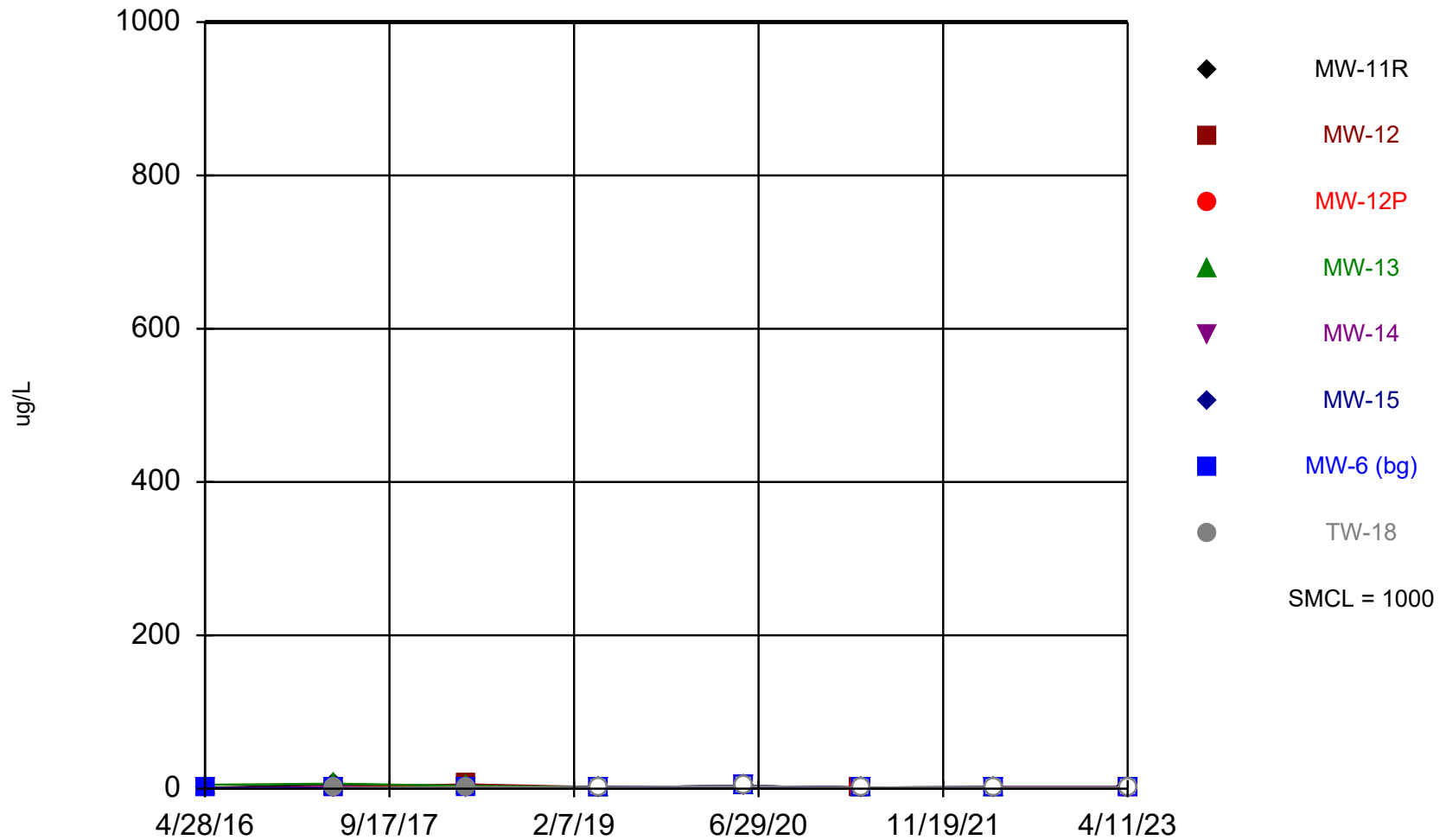
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Cobalt (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	8.2	1.6	0.7 (J)	1.9				
4/29/2016					<0.5	<0.5	<0.5	
4/19/2017							0.047 (J,B)	
4/20/2017	8	2.2	1.3	2.9	1.4	0.16 (J,B)		0.44 (J)
4/16/2018							<0.014	
4/17/2018	5.9	1.9	0.96 (J)	1.7	0.39 (J)	0.066 (J)		1.4
4/15/2019					0.28 (J)		<0.091	
4/16/2019	6.7	2.2	0.33 (J)	0.51		0.1 (J)		0.15 (J)
5/20/2020							0.17 (J)	
5/21/2020	7.2	2	0.17 (J)	0.44 (J)				
5/22/2020					0.092 (J)	<0.091		0.13 (J)
4/6/2021		1.9	<0.091					
4/7/2021	6.8			0.39 (J)	<0.091	<0.091	<0.091	<0.091
4/6/2022		1.4	<0.19 (U)		<0.19 (U)		<0.19 (U)	0.87
4/7/2022	5.7			0.85		<0.19 (U)		
4/10/2023	7.3							
4/11/2023		1.2	<0.17 (U)		<0.17 (U)		<0.17 (U)	2.9

Copper



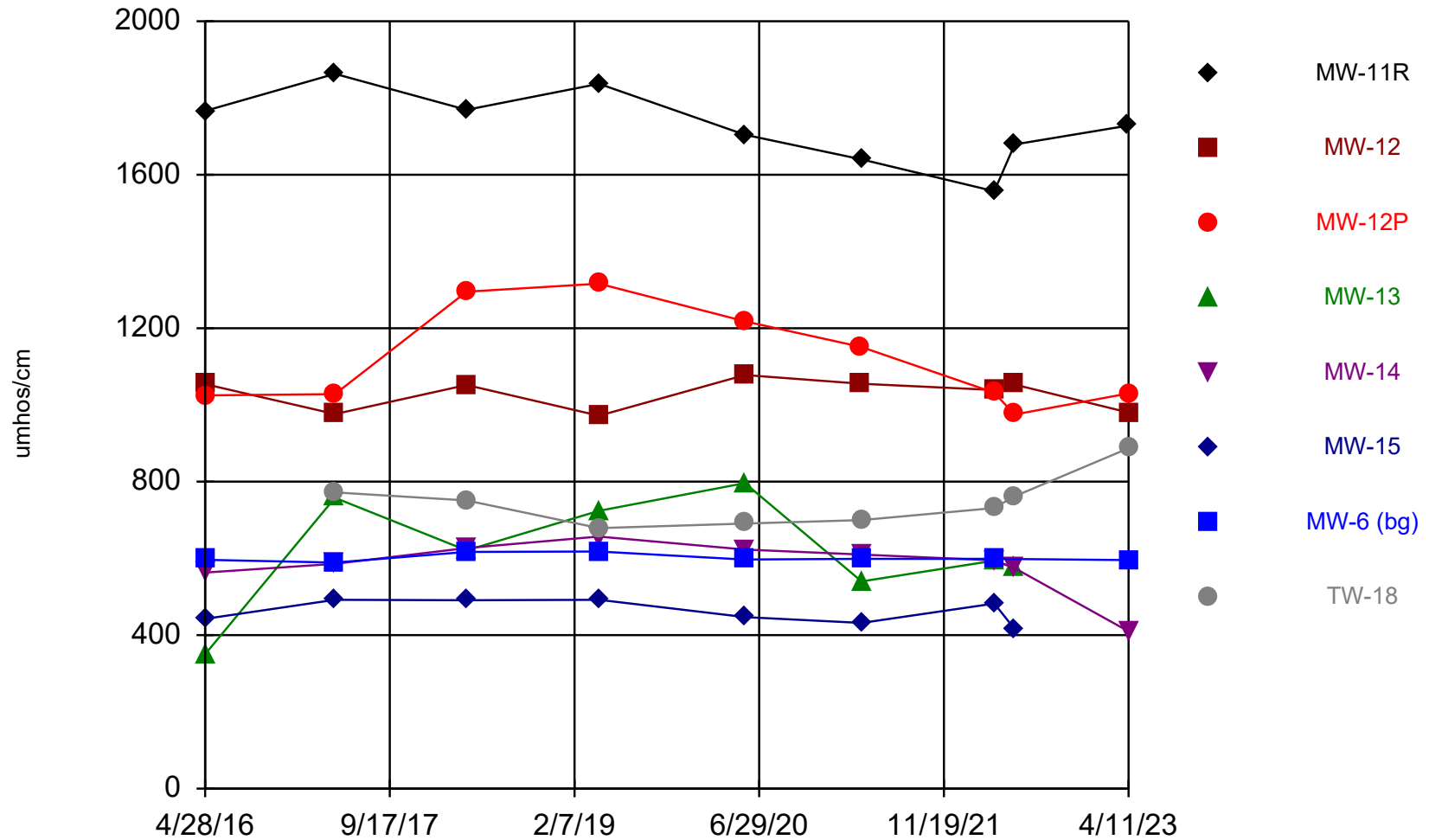
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Copper (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	0.94 (J,Y)	0.97 (J,Y)	0.58 (J,Y)	5.1				
4/29/2016					0.42 (J,Y)	0.96 (J,Y)	0.17 (J,Y)	
4/19/2017							0.21 (J,B)	
4/20/2017	5.8	1.7	2.3	6.6	2.3	0.87 (J,B)		0.84 (J,B)
4/16/2018							0.25 (J,B)	
4/17/2018	3.4	5.7	1.7	3.6	0.51 (J,B)	0.7 (J,B)		2.2
4/15/2019					<2		<2	
4/16/2019	<2	<2	<2	<2		<2		<2
5/20/2020							<3.2	
5/21/2020	<3.2	<3.2	<3.2	<3.2				
5/22/2020					<3.2	<3.2		<3.2
4/6/2021		<1.4	<1.4					
4/7/2021	<1.4			<1.4	<1.4	<1.4	<1.4	<1.4
4/6/2022		1.8 (J)	<1.8 (U)		<1.8 (U)		<1.8 (U)	<1.8 (U)
4/7/2022	<1.8 (U)			<1.8 (U)		<1.8 (U)		
4/10/2023	<1.8 (U)							
4/11/2023		<1.8 (U)	<1.8 (U)		<1.8 (U)		<1.8 (U)	<1.8 (U)

Field Conductivity



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

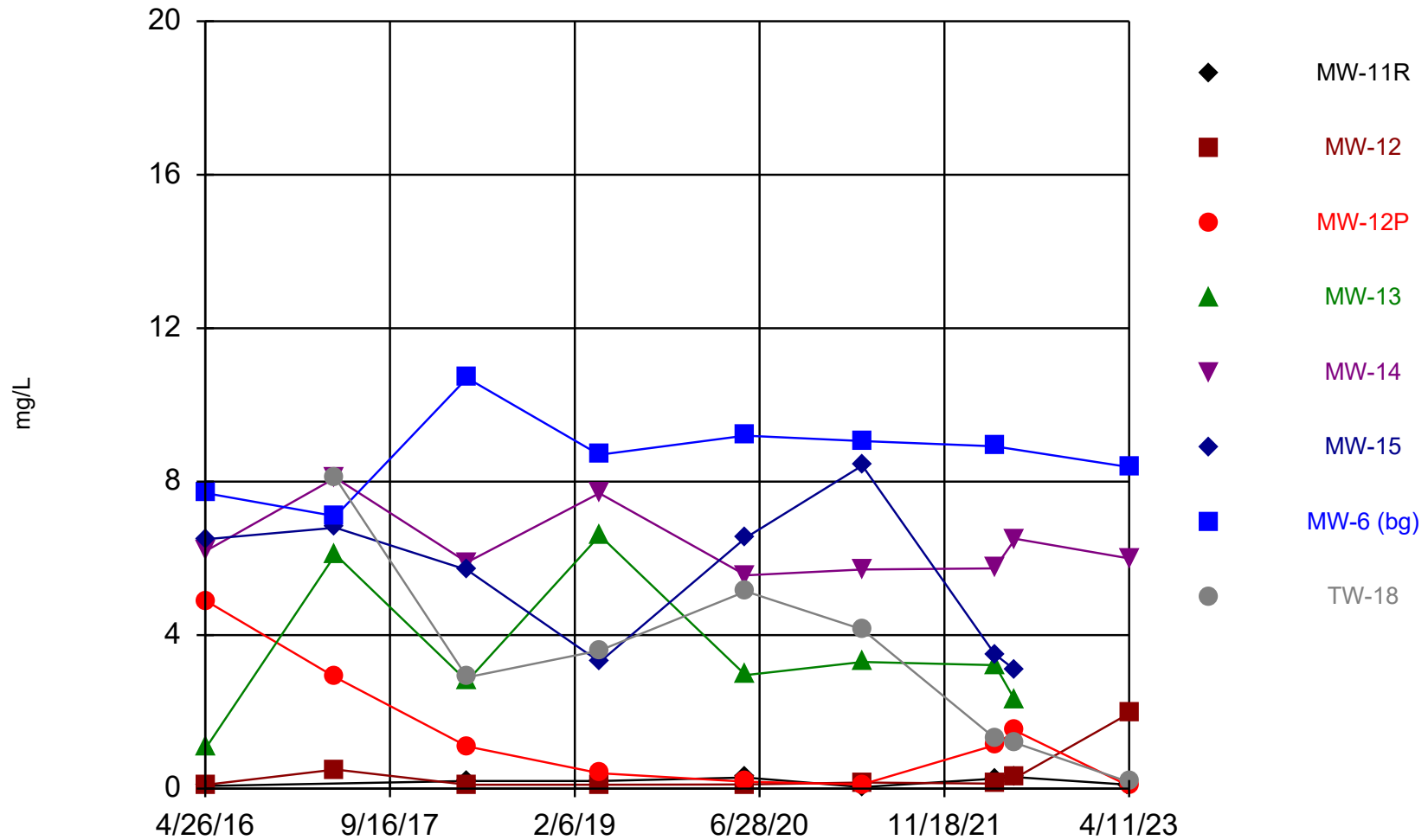
Time Series

Constituent: Field Conductivity (umhos/cm) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	1766	1054	1025	350.3				
4/29/2016					563.1	442.8	596.2	
4/19/2017							589	
4/20/2017	1863	976	1028	758	586	492		772
4/16/2018							617	
4/17/2018	1769	1052	1295	621	627	491		751
4/15/2019					657		618	
4/16/2019	1837	972	1316	724		492		679
5/20/2020							597	
5/21/2020	1704	1078	1218	796				
5/22/2020					623	447		691
4/6/2021		1055	1151					
4/7/2021	1640			540	610	432	599	700
4/6/2022		1039	1032		594.9		599	731.2
4/7/2022	1557			594		482.2		
6/2/2022	1679	1053	975	575	574.6	416.1		762
4/10/2023	1728							
4/11/2023		980	1030		409.8		595.6	887

Field Dissolved Oxygen



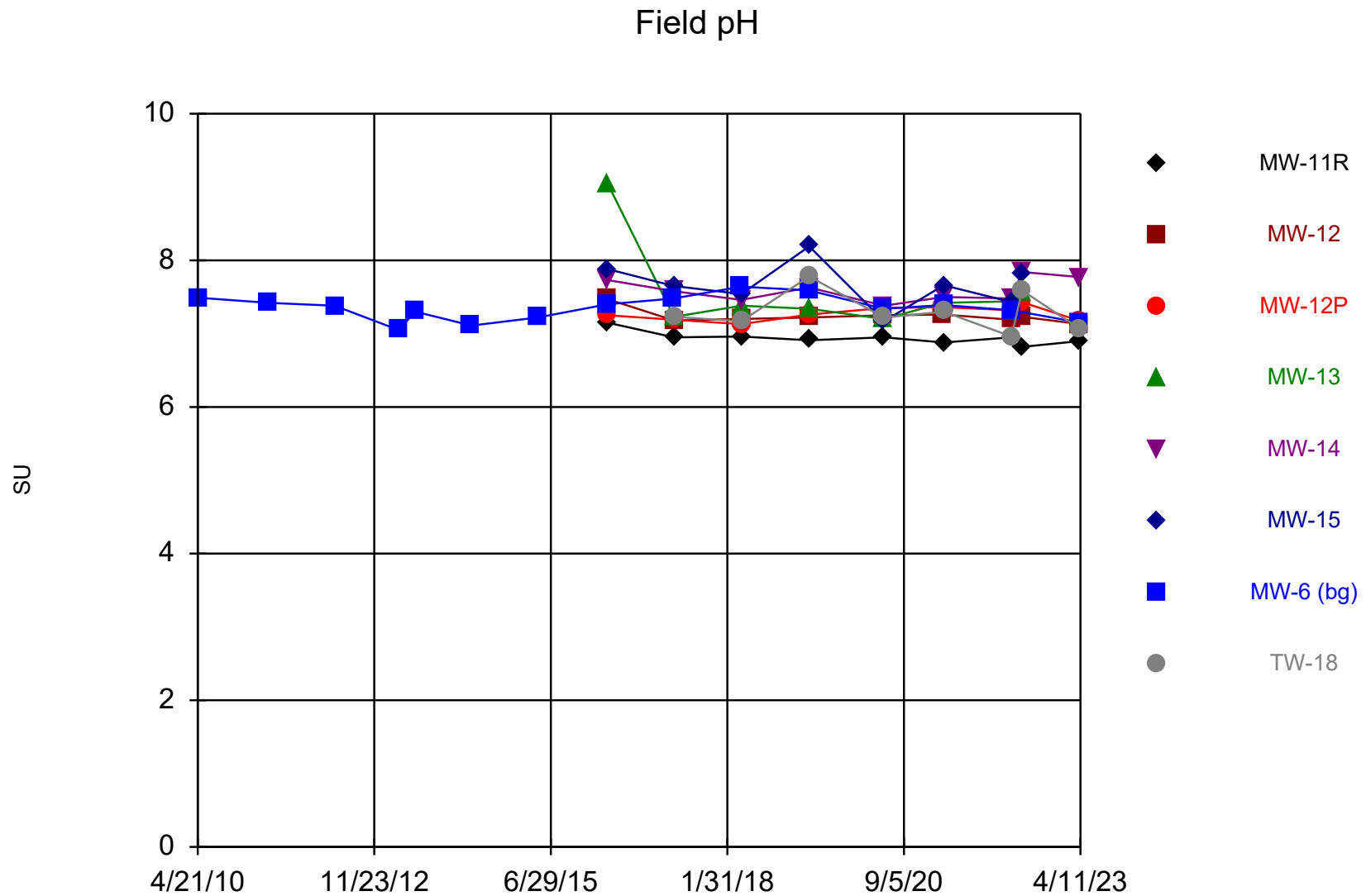
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Field Dissolved Oxygen (mg/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/26/2016	0.07							
4/29/2016		0.1	4.89	1.08	6.2	6.5	7.7	
4/19/2017		0.5	2.9	6.1	8.1	6.8	7.1	8.1
4/16/2018	0.2	0.1	1.1	2.8	5.9	5.7	10.7	2.9
4/15/2019					7.7		8.7	
4/16/2019	0.2	0.1	0.4	6.6		3.3		3.6
5/20/2020							9.2	
5/21/2020	0.29	0.11	0.18	2.96				
5/22/2020					5.56	6.54		5.14
4/6/2021		0.16	0.11					
4/7/2021	0.04			3.3	5.71	8.42	9.06	4.15
4/6/2022		0.13	1.13		5.74		8.92	1.32
4/7/2022	0.26			3.22		3.5		
6/2/2022	0.3	0.28	1.51	2.29	6.51	3.09		1.19
4/10/2023	0.1							
4/11/2023		1.96	0.07		6		8.38	0.17



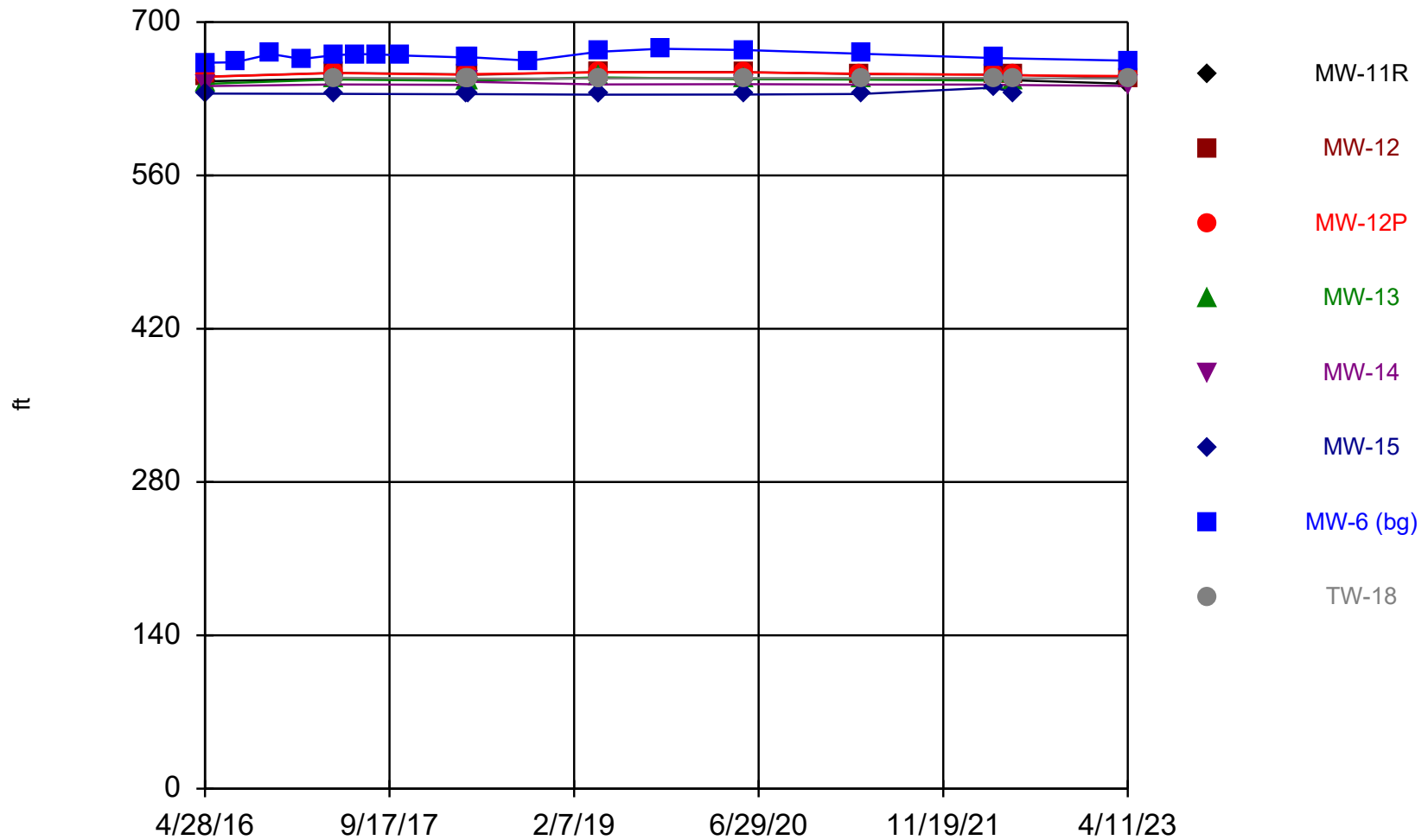
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Field pH (SU) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/21/2010							7.49	
5/4/2011							7.42	
4/25/2012							7.38	
4/2/2013							7.05	
7/2/2013							7.3	
4/29/2014							7.11	
4/20/2015							7.22	
4/28/2016	7.15	7.47	7.25	9.05				
4/29/2016					7.73	7.88	7.4	
4/19/2017							7.48	
4/20/2017	6.95	7.18	7.19	7.23	7.58	7.65		7.23
4/16/2018							7.64	
4/17/2018	6.96	7.2	7.13	7.38	7.46	7.54		7.17
4/15/2019					7.63		7.59	
4/16/2019	6.91	7.22	7.26	7.34		8.19		7.78
5/20/2020							7.34	
5/21/2020	6.95	7.25	7.35	7.2				
5/22/2020					7.38	7.17		7.22
4/6/2021		7.26	7.36					
4/7/2021	6.88			7.42	7.5	7.66	7.39	7.3
4/6/2022		7.19	7.32		7.48		7.32	6.96
4/7/2022	6.95			7.44		7.43		
6/2/2022	6.82	7.23	7.43	7.57	7.84	7.8		7.59
4/10/2023	6.9							
4/11/2023		7.13	7.17		7.77		7.15	7.06

Groundwater Elevation



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

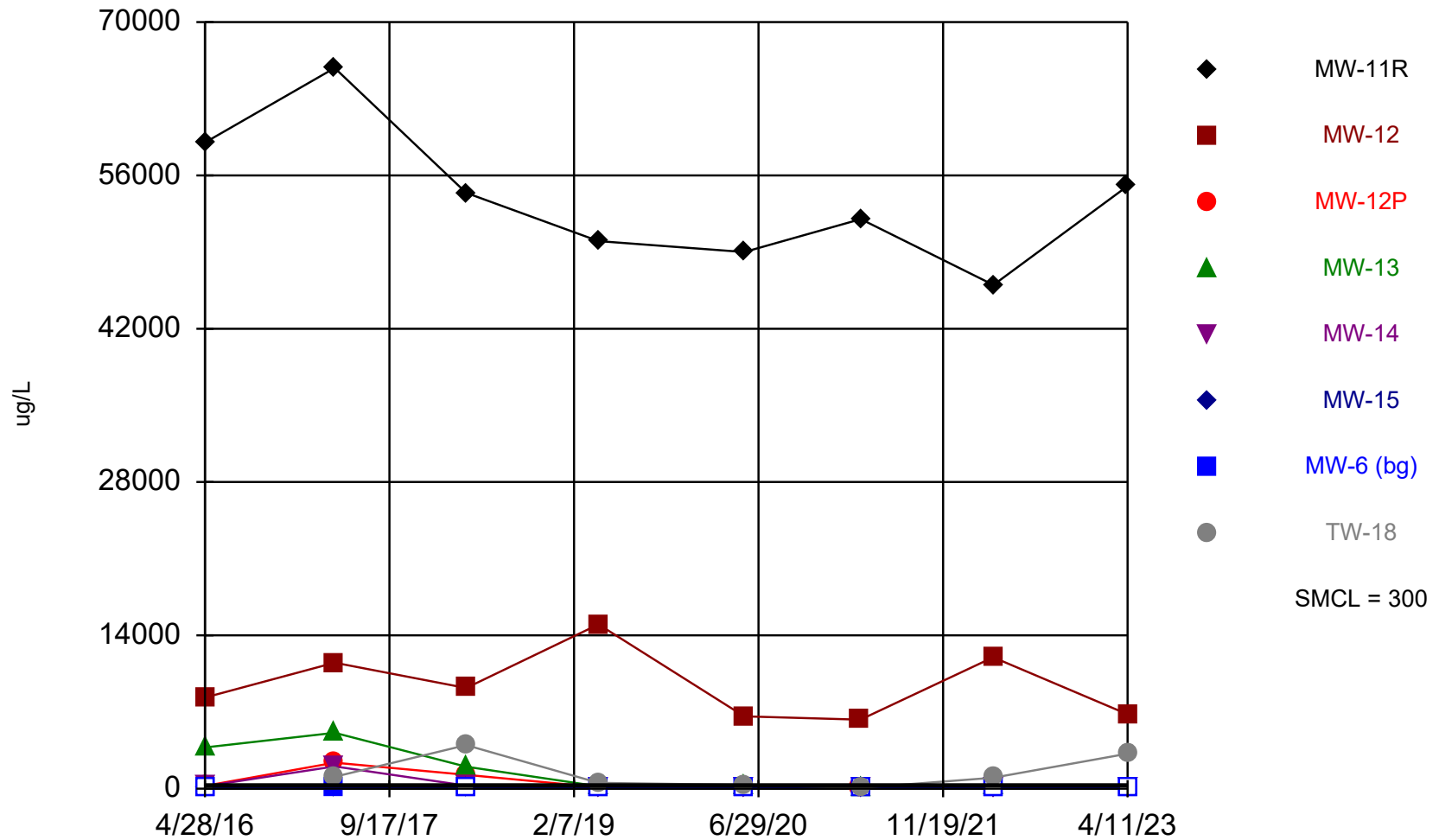
Time Series

Constituent: Groundwater Elevation (ft) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	645.96	650.05	650	643.56	641.56	634.71	662.8	
7/20/2016							663.21	
10/27/2016							670.82	
1/18/2017							666.28	
4/19/2017	648.24	653.68	653.4	647.61	643.01	634.5	669.82	649.03
6/19/2017							670.65	
8/15/2017							670.61	
10/16/2017							669.58	
4/16/2018	647.07	652.25	651.9	646.36	642.61	634.07	667.64	648.49
4/26/2018	647.47	651.75	652.54	646.38	645.46	634.14	667.96	648.35
10/8/2018							664.71	
4/15/2019	648.69	654.35	653.99	649.45	643.08	633.71	672.78	648.47
4/16/2019	648.69	654.35	653.99	649.45		633.71		648.47
10/2/2019							675.54	
5/20/2020							674.47	
5/21/2020	648.17	654.45	654.04	647.94				
5/22/2020					643.23	633.8		648.86
4/6/2021		652.31	652.92					
4/7/2021	647.97			647.39	642.92	634.38	671.08	648.86
4/6/2022		652.11	651.71		642.88		667.14	648.91
4/7/2022	647.31			646.61		640.13		
6/2/2022	646.78	651.73	651.37	645.41	642.58	635.53		648.61
4/10/2023	643.72							
4/11/2023		649.09	650.75		641.64		664.79	648.5

Iron



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

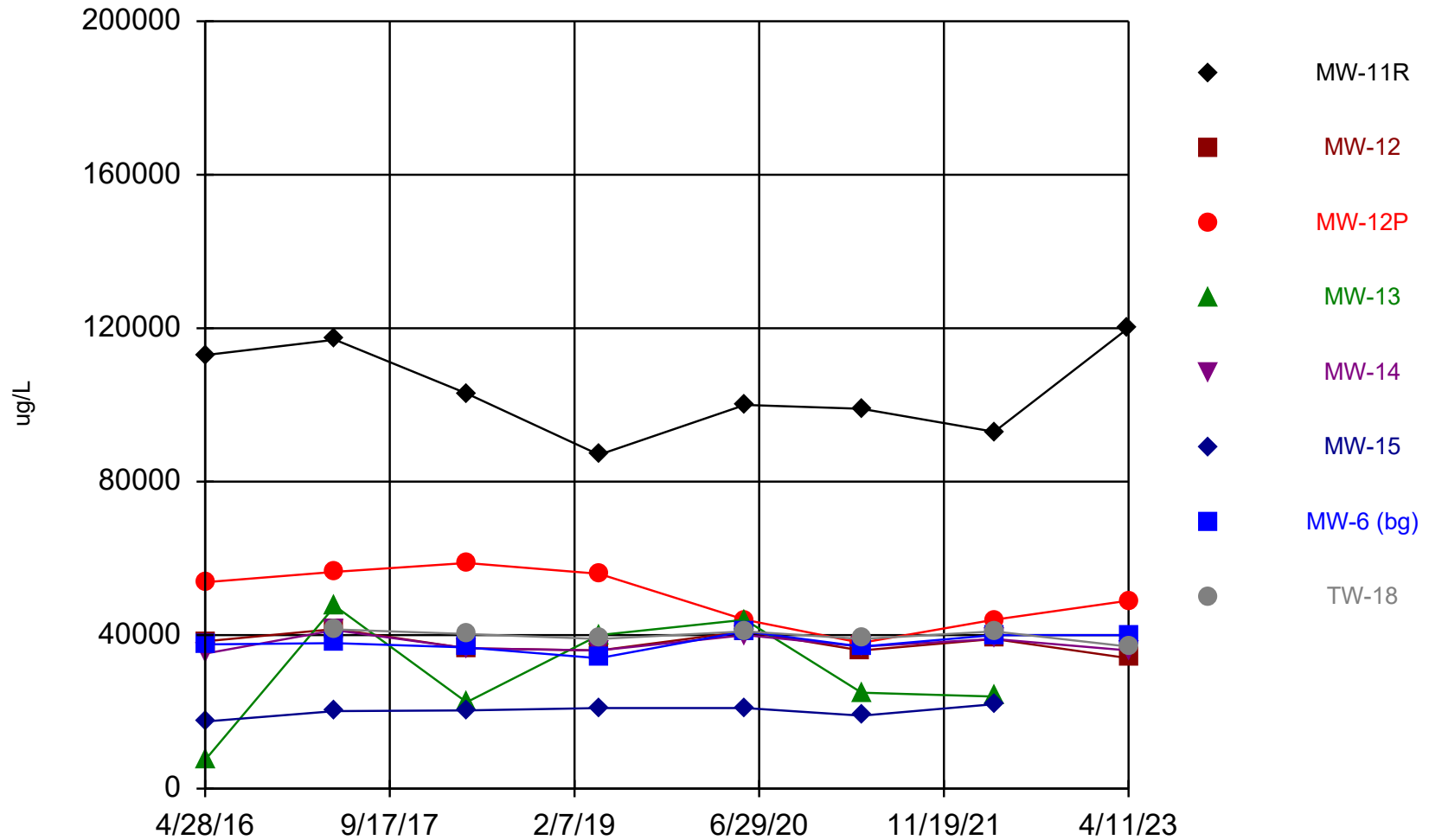
Time Series

Constituent: Iron (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	59000	8320	250	3760				
4/29/2016					226	64.8	<12.8	
4/19/2017							27.1 (J,B)	
4/20/2017	65800	11500	2370	5100	2040	94.5 (B)		1090
4/16/2018							<9.6	
4/17/2018	54400	9190	1270	2010	285	13.4 (J)		3980
4/15/2019					110 (B)		<66	
4/16/2019	50000 (B)	15000 (B)	130 (B)	220 (B)		<66		530 (B)
5/20/2020							<50	
5/21/2020	49000	6600	120	240				
5/22/2020					57 (J)	<50		340
4/6/2021		6300	<36					
4/7/2021	52000			180	39 (J)	<36	<36	79 (J)
4/6/2022		12000	39 (J)		<36 (U)		<36 (U)	1000
4/7/2022	46000			280		<36 (U)		
4/10/2023	55000							
4/11/2023		6800	<36 (U)		<36 (U)		<36 (U)	3200

Magnesium



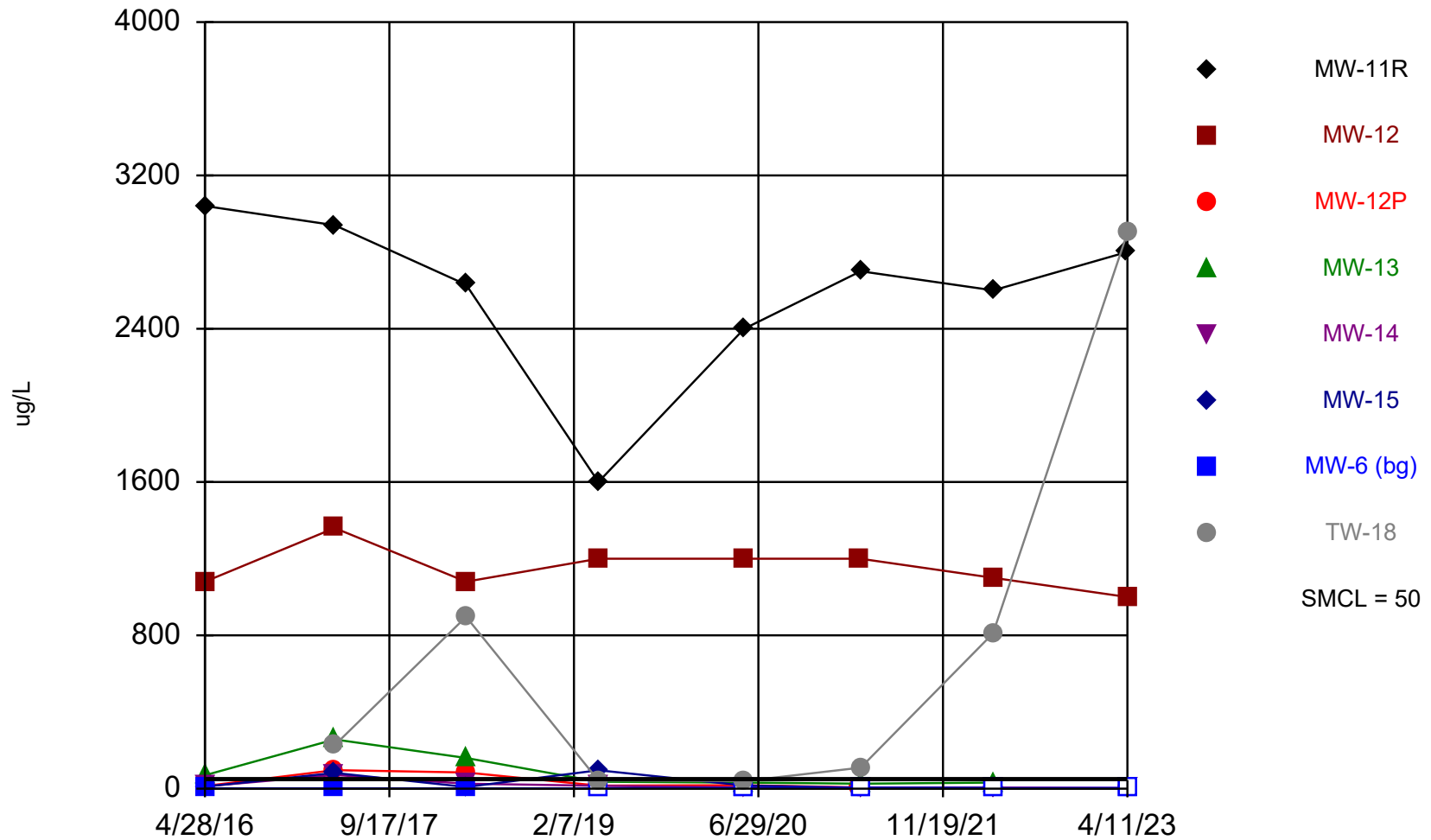
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Magnesium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	113000	38400	53800	7490				
4/29/2016					35200	17500	37600	
4/19/2017							37900	
4/20/2017	117000	41600	56500	47600	41300	20200		41500
4/16/2018							36800	
4/17/2018	103000 (M1)	36600	58800	22500	36600	20400		40300
4/15/2019					36000		34000	
4/16/2019	87000	36000	56000	40000		21000		39000
5/20/2020							41000	
5/21/2020	100000	41000	44000	44000				
5/22/2020					40000	21000		41000
4/6/2021		36000	38000					
4/7/2021	99000			25000	37000	19000	37000	39000
4/6/2022		39000	44000		39000		40000	41000
4/7/2022	93000			24000		22000		
4/10/2023	120000							
4/11/2023		34000	49000		36000		40000	37000

Manganese



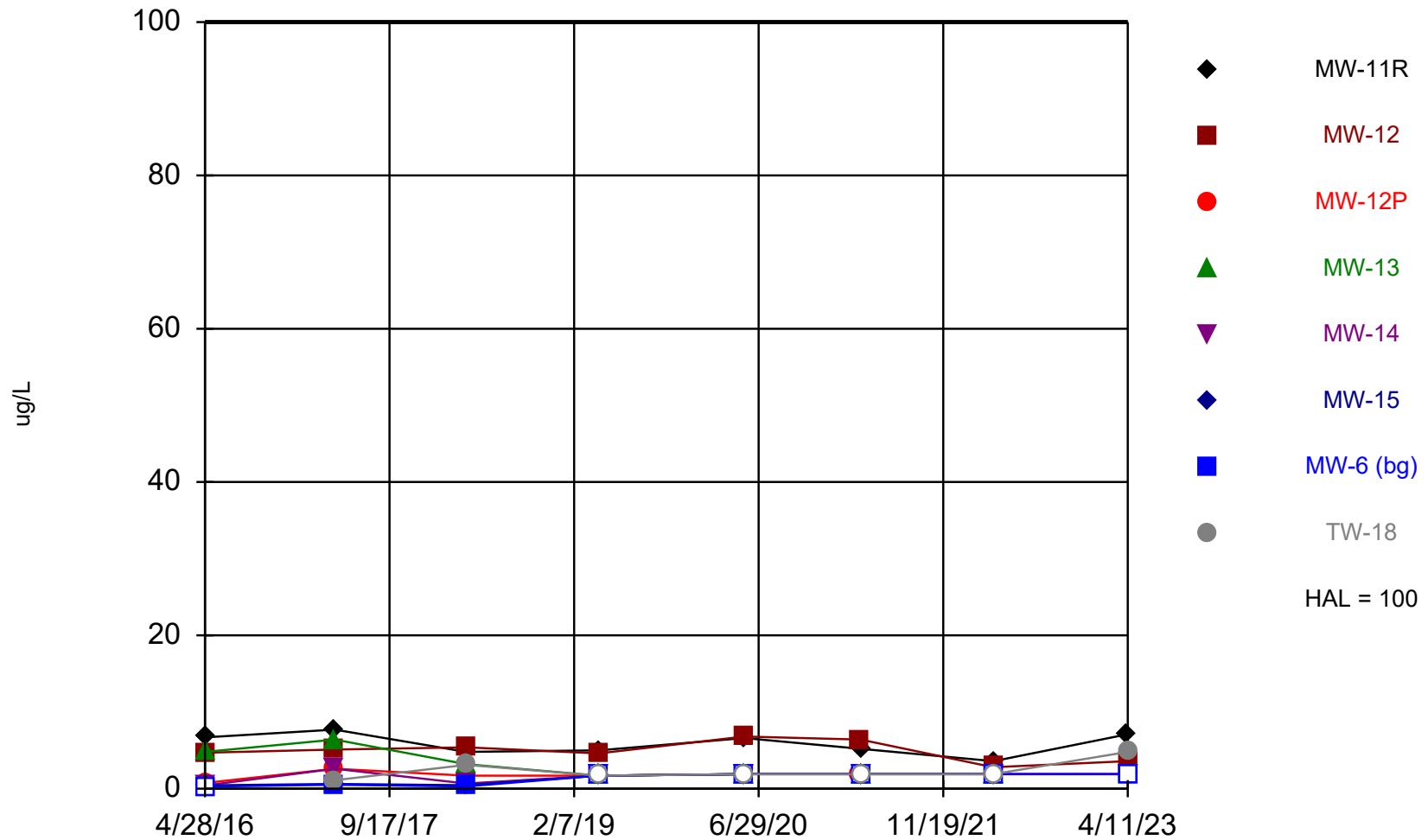
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Manganese (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	3040	1080	13.7	70.4				
4/29/2016					12.6	11.1	1.5 (Y)	
4/19/2017							1.8 (B)	
4/20/2017	2940	1360	96.9	257	71.7	82.1		227
4/16/2018							0.28 (J)	
4/17/2018	2630	1080	84.8	160	25.8	9.1		897
4/15/2019					15		<2.5	
4/16/2019	1600	1200	16	36		96		43
5/20/2020							<4	
5/21/2020	2400	1200	18	32				
5/22/2020					6 (J)	17		40
4/6/2021		1200	6.7 (J)					
4/7/2021	2700			26	<4.4	<4.4	<4.4	110
4/6/2022		1100	4.9 (J)		<3.6 (U)		<3.6 (U)	810
4/7/2022	2600			32		<3.6 (U)		
4/10/2023	2800							
4/11/2023		1000	<3.6 (U)		<3.6 (U)		<3.6 (U)	2900

Nickel



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

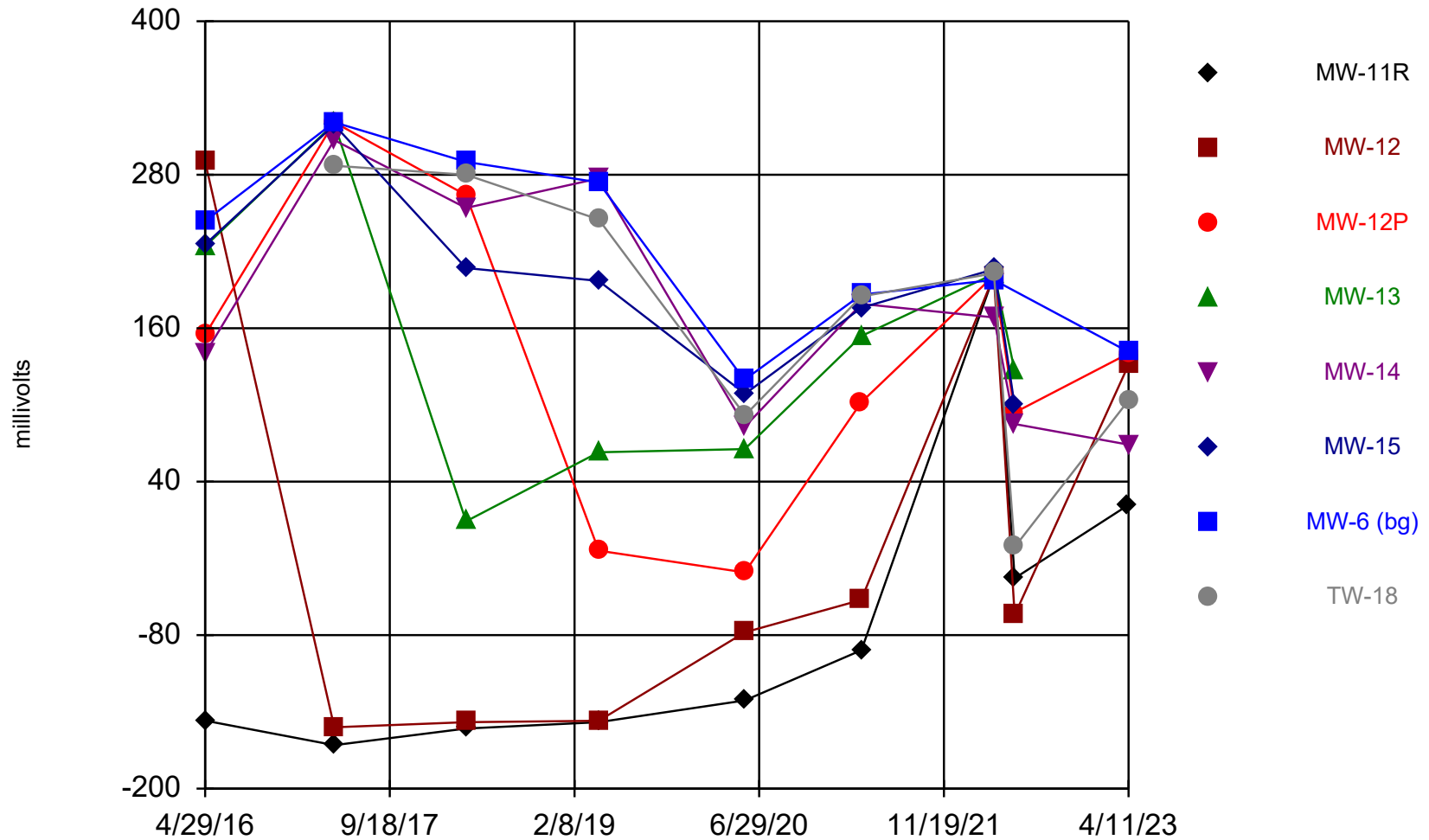
Time Series

Constituent: Nickel (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	6.7	4.7	0.74 (J)	4.8				
4/29/2016					0.42 (J)	0.44 (J)	<0.27	
4/19/2017							0.5 (J,B)	
4/20/2017	7.7	5.1	2.6	6.4	2.6	0.62 (J,B)		1.1 (B)
4/16/2018							0.3 (J)	
4/17/2018	4.8	5.4	1.7	3.2	0.67 (J)	0.46 (J)		3.1
4/15/2019					<1.7		<1.7	
4/16/2019	5	4.6 (J)	<1.7	<1.7		<1.7		<1.7
5/20/2020							<1.9	
5/21/2020	6.6	6.8	<1.9	<1.9				
5/22/2020					<1.9	<1.9		<1.9
4/6/2021		6.4	<1.9					
4/7/2021	5.2			<1.9	<1.9	<1.9	<1.9	<1.9
4/6/2022		2.8 (J)	<1.9 (U)		<1.9 (U)		<1.9 (U)	<1.9 (U)
4/7/2022	3.6 (J)			<1.9 (U)		<1.9 (U)		
4/10/2023	7.1							
4/11/2023		3.6 (J)	<1.9 (U)		<1.9 (U)		<1.9 (U)	4.8 (J)

Oxidation Reduction Potential



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

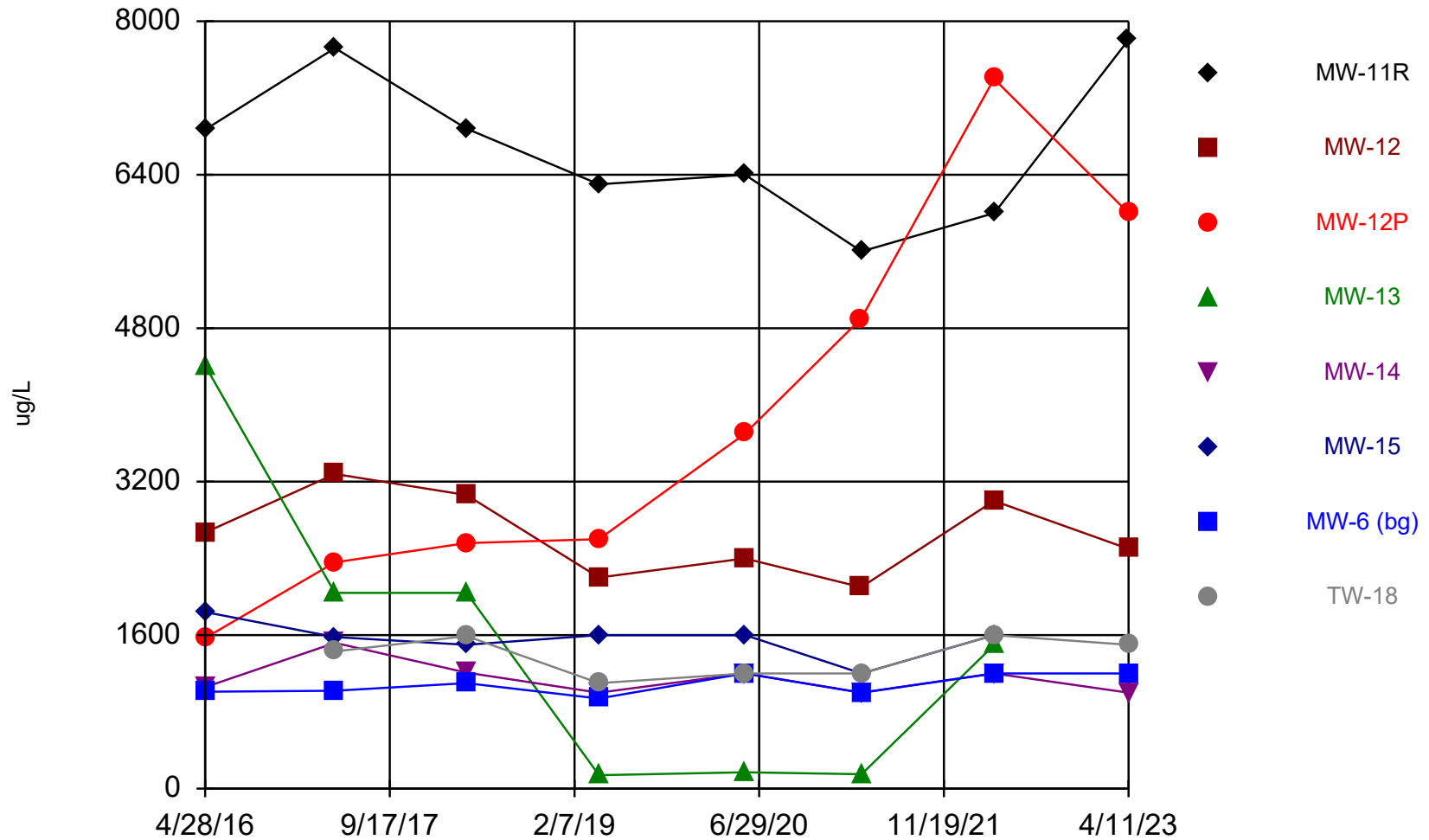
Time Series

Constituent: Oxidation Reduction Potential (millivolts) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/29/2016	-146.9	290.1	154.9	224	140	225.4	243.7	
4/19/2017	-166	-152	321	320	307	319	321	287
4/16/2018	-153	-148	264	9	254	207	290	280
4/15/2019					277		274	
4/16/2019	-148	-147	-14	63		197		245
5/20/2020							119.6	
5/21/2020	-131	-77.8	-30.9	65.5				
5/22/2020					83.1	108.7		91.9
4/6/2021		-52.5	101.9					
4/7/2021	-91.8			153.9	179	176	186.2	184.8
4/6/2022		200.9	201.2		168.4		197.7	202.9
4/7/2022	202.1			202.6		206.2		
6/2/2022	-35.5	-64.3	94	126.4	85.1	99.2		-11.1
4/10/2023	21.6							
4/11/2023		131.4	140.3		68.9		141.4	103.6

Potassium



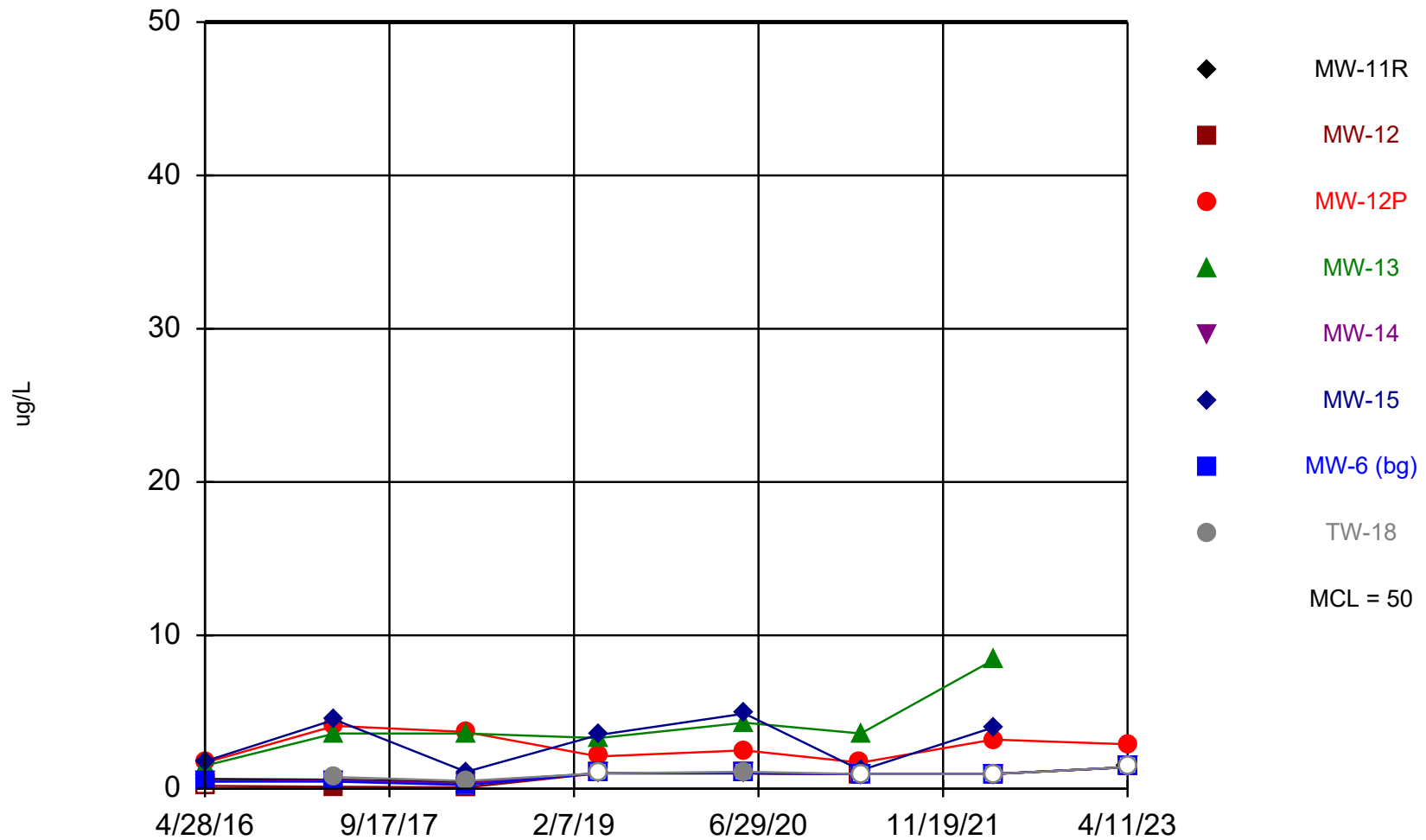
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Potassium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	6870	2670	1570	4410				
4/29/2016					1060	1840	1010	
4/19/2017							1020	
4/20/2017	7720	3280	2360	2040	1520	1580		1430
4/16/2018							1100	
4/17/2018	6880	3060	2560	2040	1210	1500		1590
4/15/2019					1000		940	
4/16/2019	6300	2200	2600	140 (J)		1600		1100
5/20/2020							1200	
5/21/2020	6400	2400	3700	170 (J)				
5/22/2020					1200	1600		1200
4/6/2021		2100	4900					
4/7/2021	5600			150 (J)	1000	1200	1000	1200
4/6/2022		3000	7400		1200		1200	1600
4/7/2022	6000			1500		1600		
4/10/2023	7800							
4/11/2023		2500	6000		1000		1200	1500

Selenium



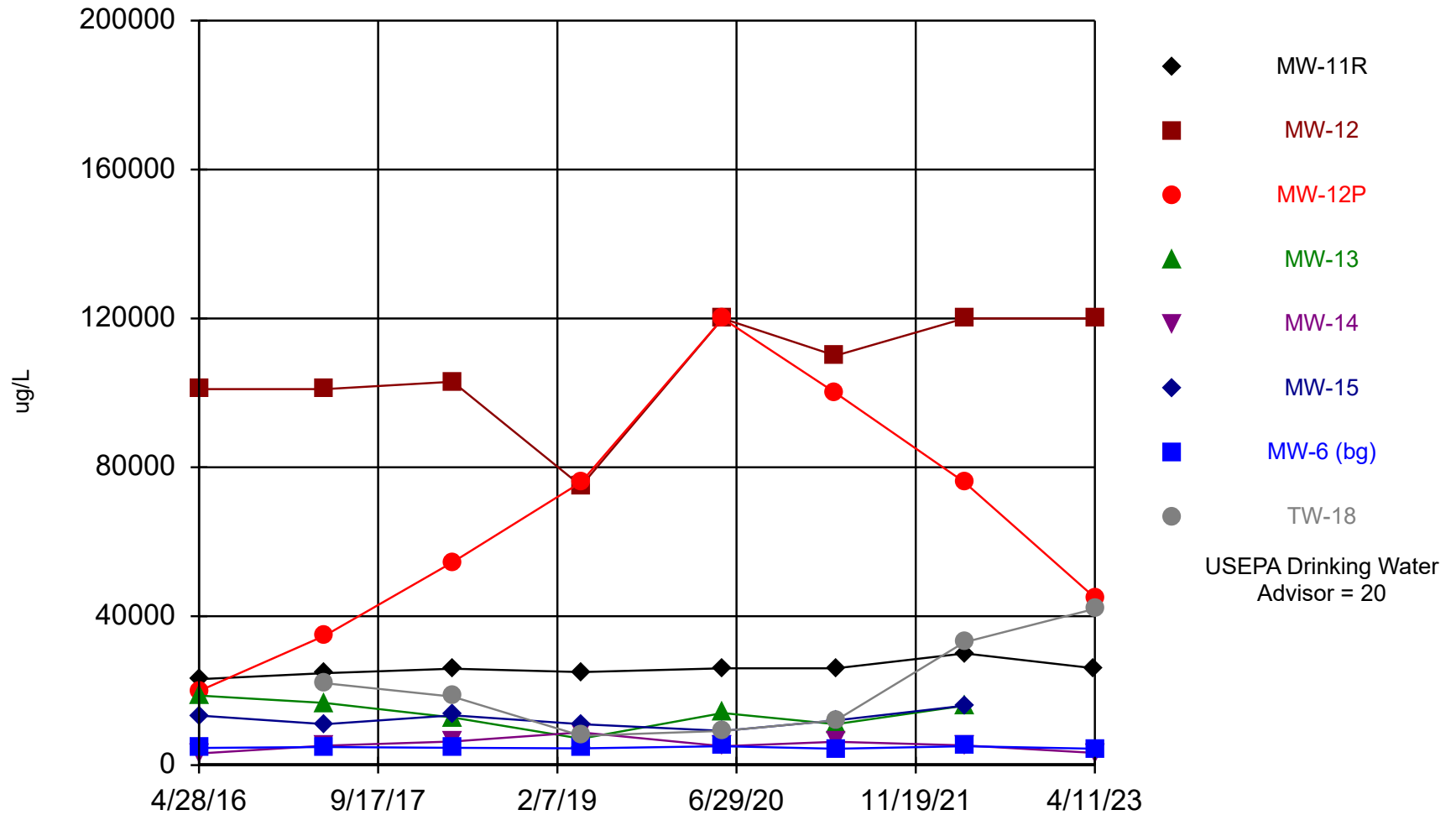
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Selenium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	0.63 (J)	<0.18	1.7	1.5				
4/29/2016					0.48 (J)	1.8	0.46 (J)	
4/19/2017							0.46 (J)	
4/20/2017	0.59 (J)	0.13 (J)	4.1	3.6	0.54 (J)	4.5		0.76 (J)
4/16/2018							0.24 (J)	
4/17/2018	0.44 (J)	<0.086	3.7	3.6	0.34 (J)	1.1		0.51 (J)
4/15/2019					<1		<1	
4/16/2019	<1	<1	2.1 (J)	3.3 (J)		3.5 (J)		<1
5/20/2020							<1	
5/21/2020	<1	<1	2.5 (J)	4.3 (J)				
5/22/2020					<1	4.9 (J)		1.1 (J)
4/6/2021		<0.96	1.7 (J)					
4/7/2021	<0.96			3.6 (J,B)	<0.96	1.2 (J,B)	<0.96	<0.96
4/6/2022		<0.96 (U)	3.2 (J)		<0.96 (U)		<0.96 (U)	<0.96 (U)
4/7/2022	<0.96 (U)			8.4		4 (J)		
4/10/2023	1.4 (J)							
4/11/2023		<1.4 (U)	2.9 (J)		<1.4 (U)		<1.4 (U)	<1.4 (U)

Sodium



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

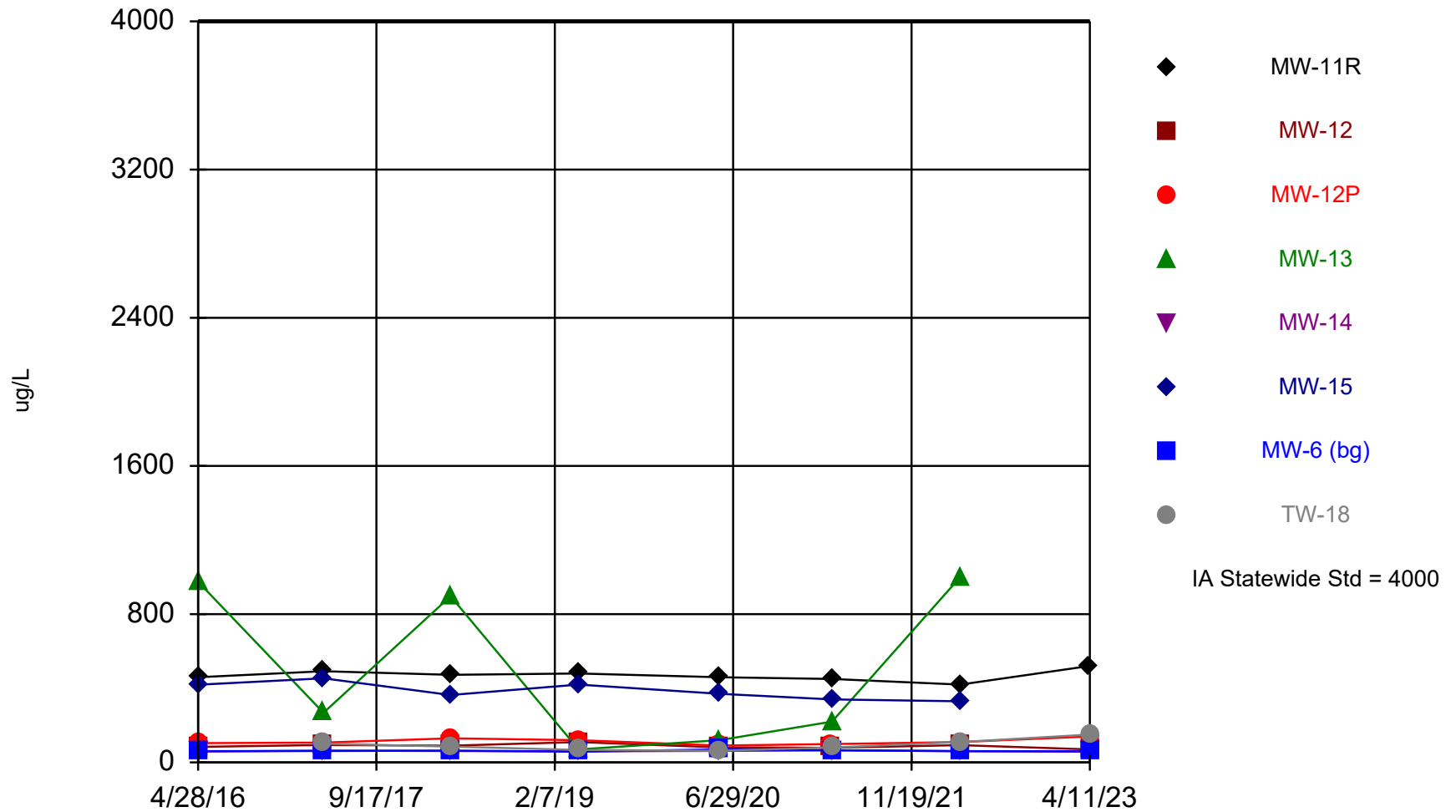
Time Series

Constituent: Sodium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	23100	101000	19900	18700				
4/29/2016					3140	13300	4610	
4/19/2017							4870	
4/20/2017	24700	101000	34800	16700	5220	11000		22000
4/16/2018							4650	
4/17/2018	25900	103000	54500	12800	6340	13400		18400
4/15/2019					8800		4500	
4/16/2019	25000	75000	76000	7100		11000		7900
5/20/2020							5100	
5/21/2020	26000	120000	120000	14000				
5/22/2020					5100	9200		9200
4/6/2021		110000	100000					
4/7/2021	26000			11000	6300	12000	4400	12000
4/6/2022		120000	76000		5300		5100	33000
4/7/2022	30000			16000		16000		
4/10/2023	26000							
4/11/2023		120000	45000		3300		4400	42000

Strontium



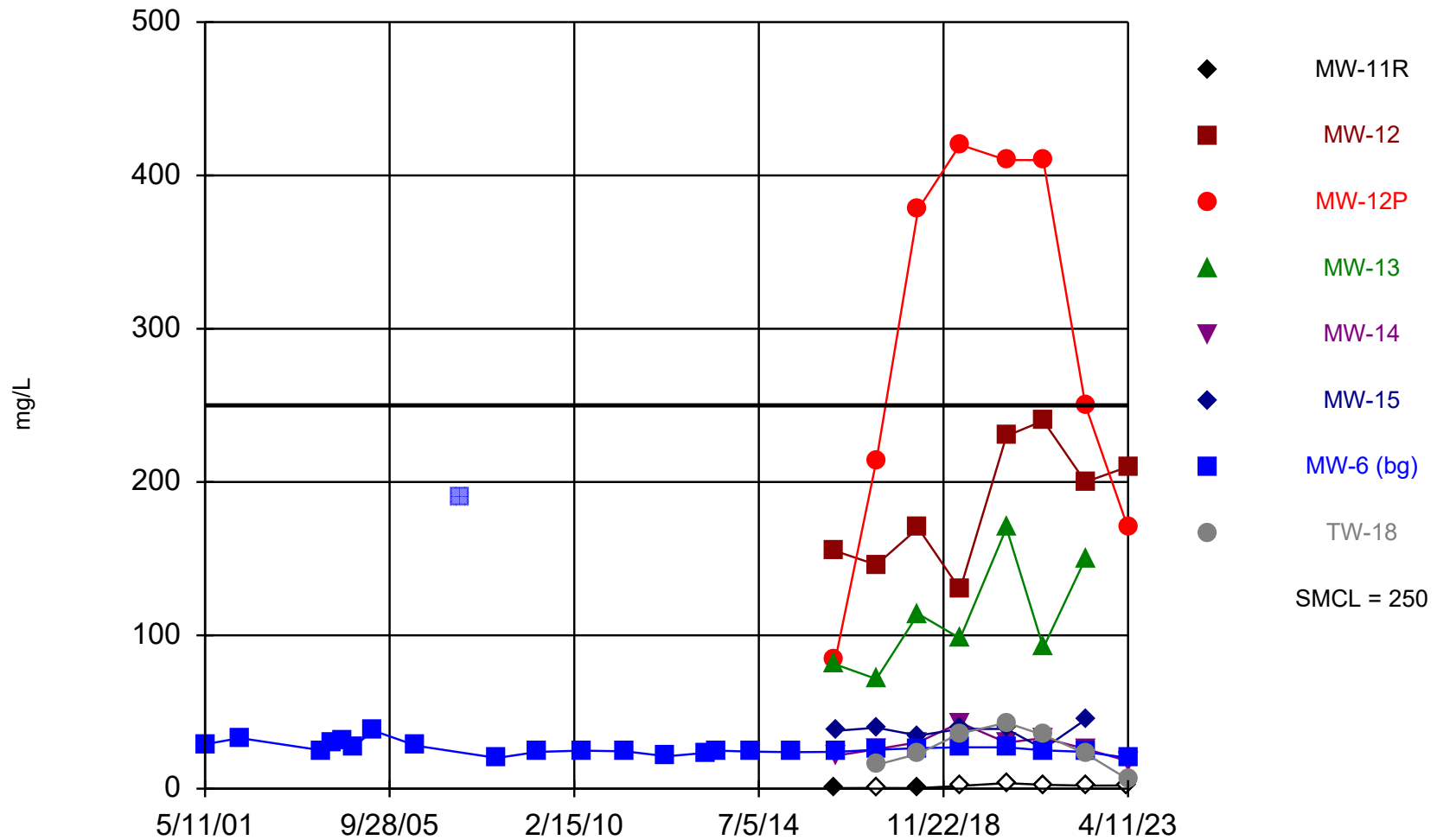
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Strontium (ug/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	460 (Y)	83.9	104 (Y)	975 (Y)				
4/29/2016					58.3 (Y)	419 (Y)	60.7 (Y)	
4/19/2017							61.2 (N2)	
4/20/2017	492 (N2)	94.2 (N2)	107 (N2)	268 (N2)	63.8 (N2)	454 (N2)		101 (N2)
4/16/2018							63.8 (N2)	
4/17/2018	473 (N2)	90.6 (N2)	130 (N2)	897 (N2)	61.6 (N2)	364 (N2)		85.6 (N2)
4/15/2019					60		58	
4/16/2019	480	110	120	70		420		67
5/20/2020							70	
5/21/2020	460	81	91	120				
5/22/2020					62	370		63
4/6/2021		79	99					
4/7/2021	450			220	65	340	66	80
4/6/2022		93	110		61		61	110
4/7/2022	420			1000		330		
4/10/2023	520							
4/11/2023		70	140		58		60	150

Sulfate



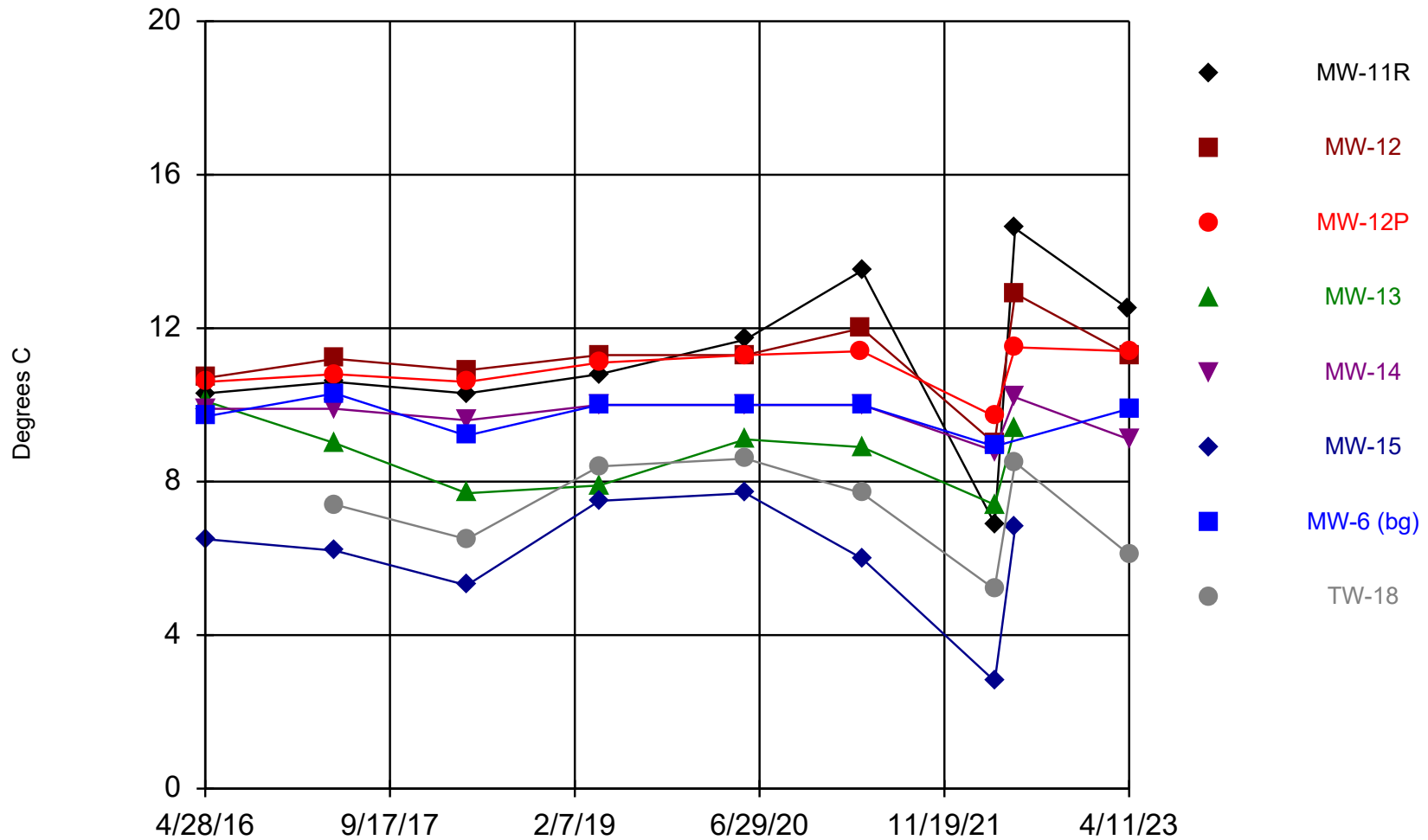
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Sulfate (mg/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
5/11/2001							29	
3/8/2002							33	
2/19/2004							25	
5/26/2004							30	
8/23/2004							31	
11/18/2004							27	
5/5/2005							38	
5/19/2006							28 (J)	
5/30/2007							190 (X)	
4/16/2008							20	
4/3/2009							24	
4/21/2010							24.8	
5/4/2011							24.4	
4/25/2012							21.1	
4/2/2013							23.4	
7/2/2013							24.8	
4/29/2014							24.2	
4/20/2015							23.8	
4/28/2016	0.38 (J,Y)	155	84.1	81.1				
4/29/2016					21.5	37.7	24	
4/19/2017							25.4	
4/20/2017	<0.5	146	214	71.5	25.7	39.8		15.5
4/16/2018							26.4	
4/17/2018	0.39 (J)	170	378	114	30.3	34.6		22.7
4/15/2019					43		27	
4/16/2019	<1.8	130	420	98		39		36
5/20/2020							27	
5/21/2020	<3.6	230	410	170				
5/22/2020					30	39		43
4/6/2021		240	410					
4/7/2021	<2.5			92	33	26	25	35
4/6/2022		200	250		26		24	23
4/7/2022	<2 (U)			150		45		
4/10/2023	<2.1 (U)							
4/11/2023		210	170		18		20	6.1

Temperature, Field



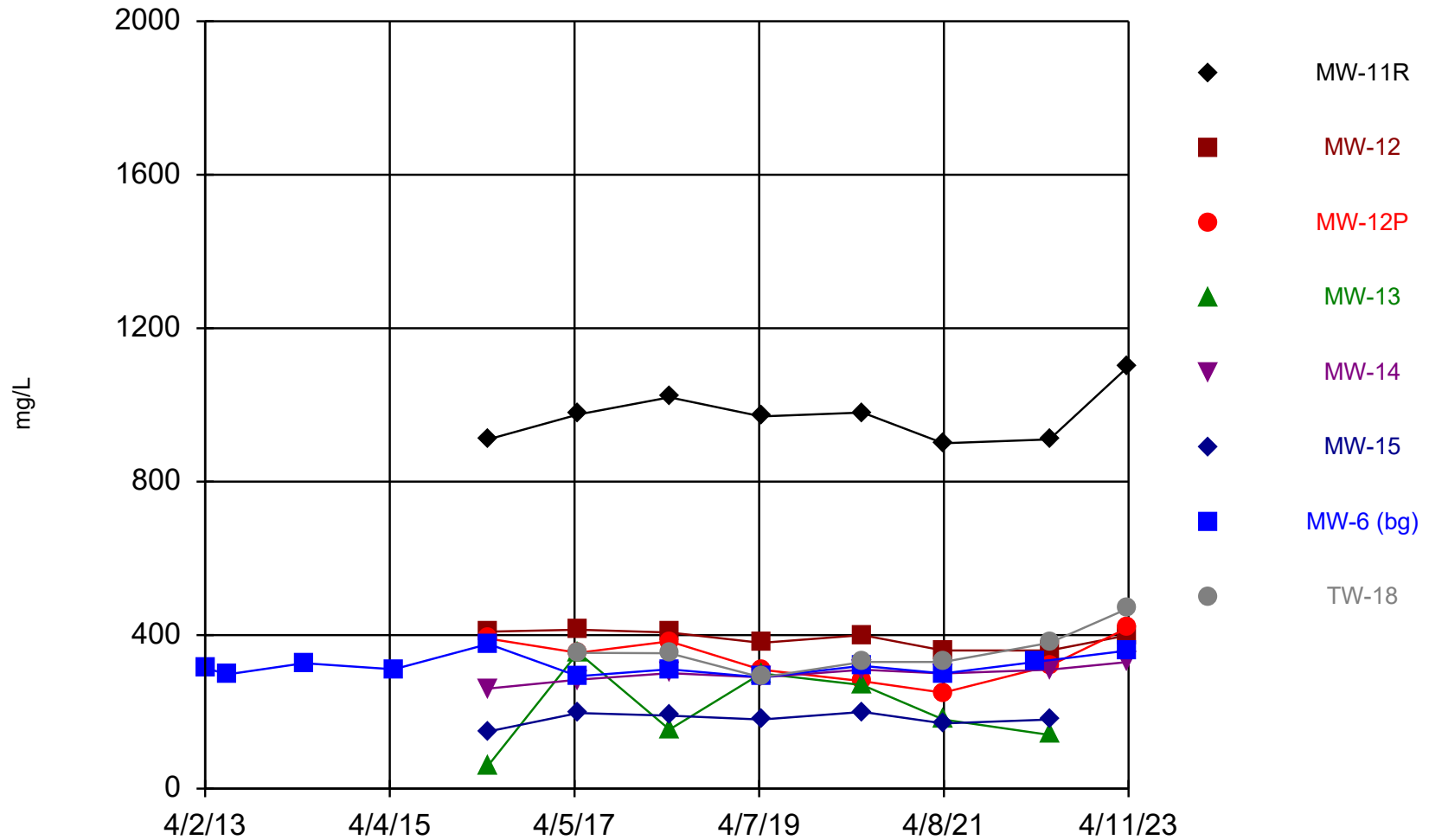
Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Temperature, Field (Degrees C) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/28/2016	10.3	10.7	10.6	10.1				
4/29/2016					9.9	6.5	9.7	
4/19/2017							10.3	
4/20/2017	10.6	11.2	10.8	9	9.9	6.2		7.4
4/16/2018							9.2	
4/17/2018	10.3	10.9	10.6	7.7	9.6	5.3		6.5
4/15/2019					10		10	
4/16/2019	10.8	11.3	11.1	7.9		7.5		8.4
5/20/2020							10	
5/21/2020	11.7	11.3	11.3	9.1				
5/22/2020					10	7.7		8.6
4/6/2021		12	11.4					
4/7/2021	13.5			8.9	10	6	10	7.7
4/6/2022		9	9.7		8.8		8.92	5.2
4/7/2022	6.9			7.4		2.8		
6/2/2022	14.6	12.9	11.5	9.4	10.2	6.8		8.5
4/10/2023	12.5							
4/11/2023		11.3	11.4		9.1		9.9	6.1

Total Alkalinity



Time Series Analysis Run 7/13/2023 3:01 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Time Series

Constituent: Total Alkalinity (mg/L) Analysis Run 7/13/2023 3:02 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-12P	MW-13	MW-14	MW-15	MW-6 (bg)	TW-18
4/2/2013							314	
7/2/2013							298	
4/29/2014							327	
4/20/2015							311	
4/28/2016	910	409	391	60.2				
4/29/2016					261	149	377	
4/19/2017							293	
4/20/2017	975	414	354	355	284	197		354
4/16/2018							311	
4/17/2018	1020	407	384	154	301	190		353
4/15/2019					290		290	
4/16/2019	970	380	310	300		180		290
5/20/2020							320	
5/21/2020	980	400	280	270				
5/22/2020					310	200		330
4/6/2021		360	250					
4/7/2021	900			180	300	170	300	330
4/6/2022							330	
6/2/2022	910	360	320	140	310	180		380
4/10/2023	1100							
4/11/2023		400	420		330		360	470

Attachment D2

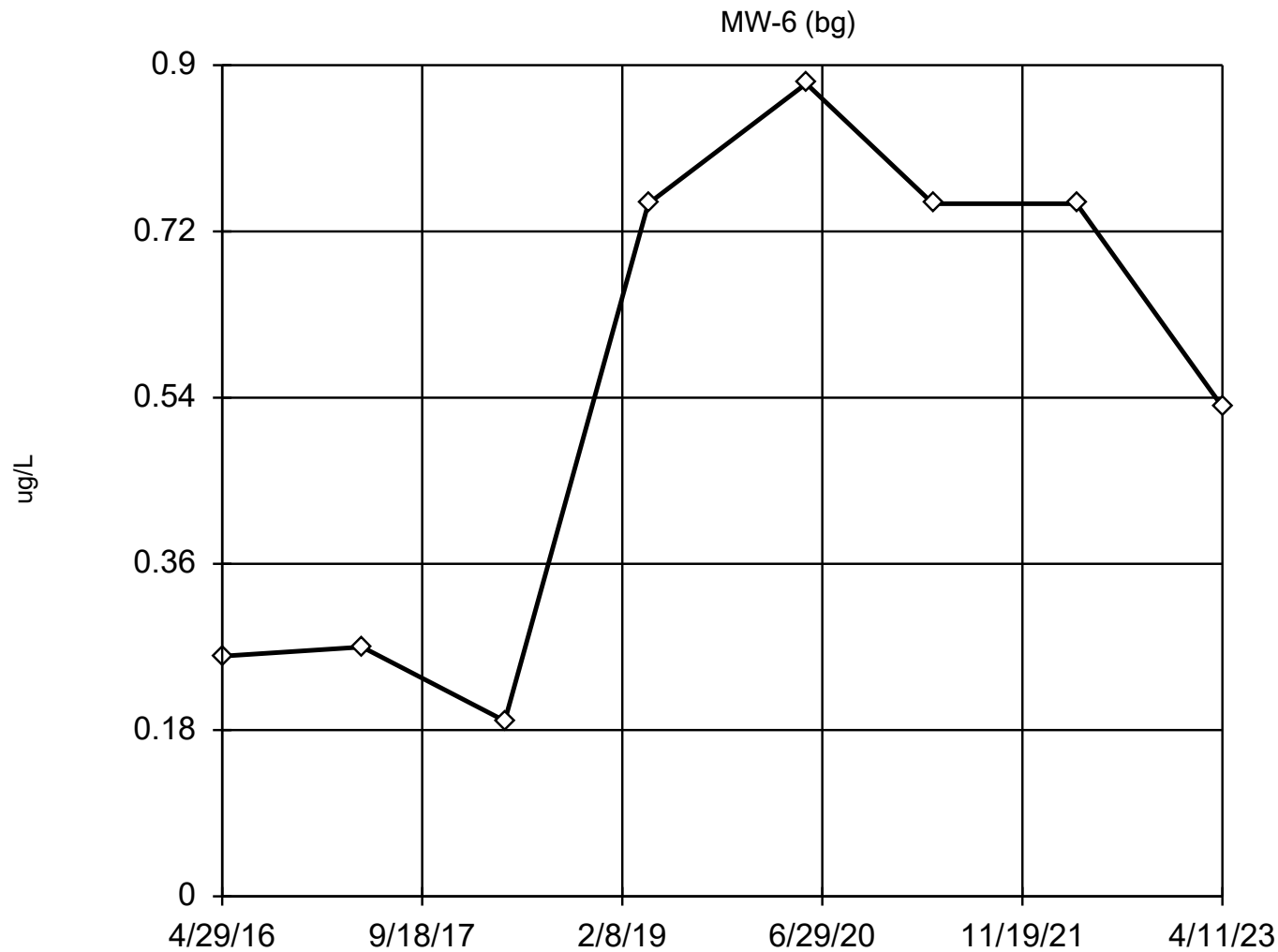
Outlier Analysis Results

Outlier Analysis

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions Printed 10/2/2023, 8:48 AM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Arsenic (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	0.5475	0.2729	normal	ShapiroWilk
Barium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	45.85	2.517	normal	ShapiroWilk
Boron (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	60.1	27.06	normal	ShapiroWilk
Calcium (mg/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	71.15	5.151	normal	ShapiroWilk
Chloride (mg/L)	MW-6 (bg)	No	n/a	n/a	NP (nrm)	NaN	26	5.748	2.527	unknown	ShapiroWilk
Cobalt (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	0.1591	0.1513	ln(x)	ShapiroWilk
Copper (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	1.354	1.079	normal	ShapiroWilk
Field pH (SU)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	15	7.352	0.1682	normal	ShapiroWilk
Iron (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	34.19	18.46	normal	ShapiroWilk
Magnesium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	38038	2255	normal	ShapiroWilk
Manganese (ug/L)	MW-6 (bg)	No	n/a	n/a	Dixon`s	0.05	8	2.71	1.432	normal	ShapiroWilk
Nickel (ug/L)	MW-6 (bg)	No	n/a	n/a	NP (nrm)	NaN	8	1.296	0.7838	unknown	ShapiroWilk
Potassium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	1084	105.6	normal	ShapiroWilk
Selenium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	0.81	0.3846	normal	ShapiroWilk
Sodium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	4704	287.7	normal	ShapiroWilk
Strontium (ug/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	8	62.59	3.851	normal	ShapiroWilk
Sulfate (mg/L)	MW-6 (bg)	Yes	190	5/30/2007	Rosner`s	0.01	26	32.32	32.4	ln(x)	ShapiroWilk
Total Alkalinity (mg/L)	MW-6 (bg)	No	n/a	n/a	EPA 1989	0.05	12	319.3	26.46	normal	ShapiroWilk

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.5475, std. dev. 0.2729, critical Tn 2.032

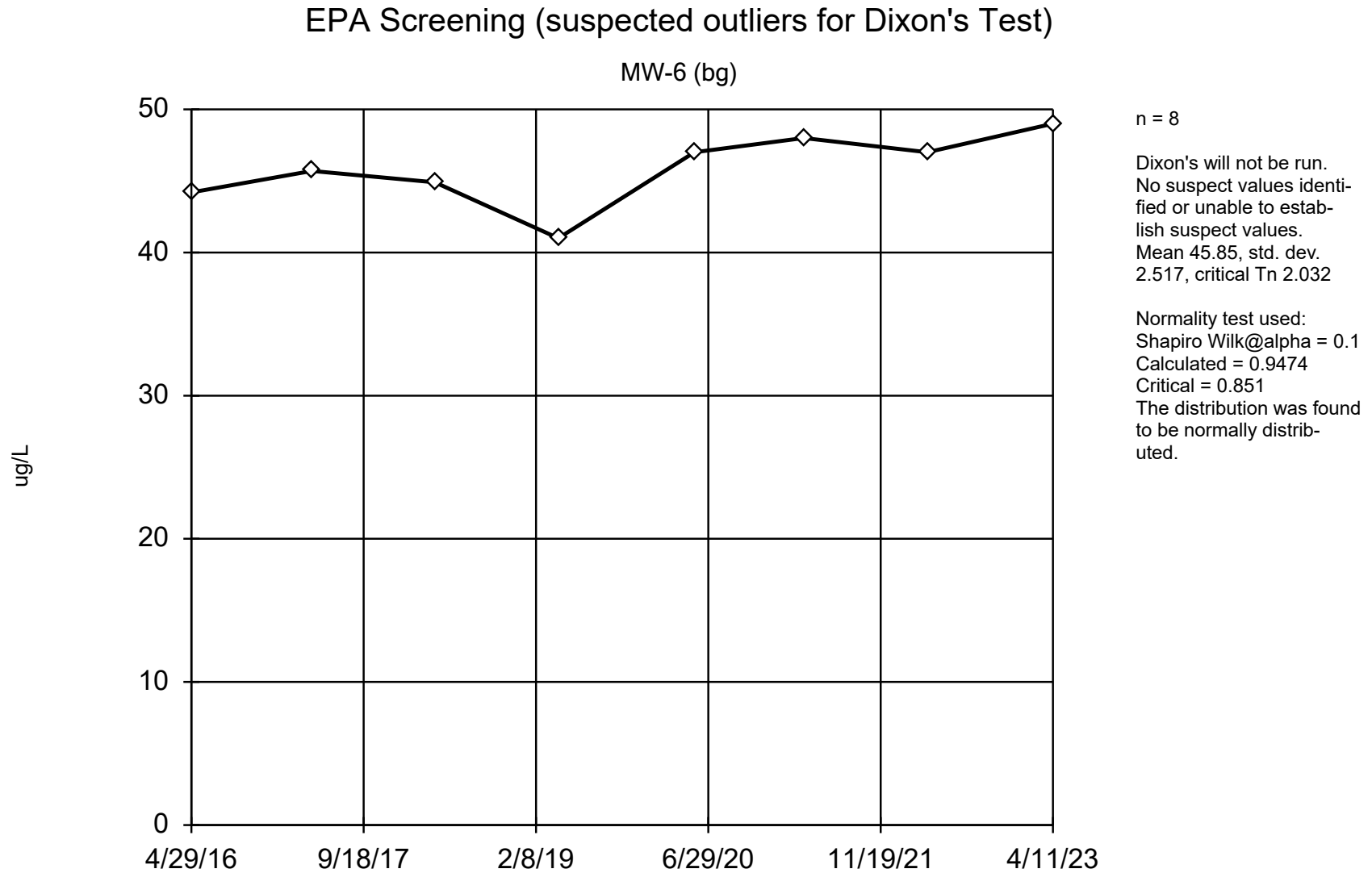
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8575
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/2/2023 8:46 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	0.26 (J)
4/19/2017	0.27 (J)
4/16/2018	0.19 (J)
4/15/2019	<0.75
5/20/2020	<0.88
4/7/2021	<0.75
4/6/2022	<0.75 (U)
4/11/2023	<0.53 (U)



Constituent: Barium Analysis Run 10/2/2023 8:46 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

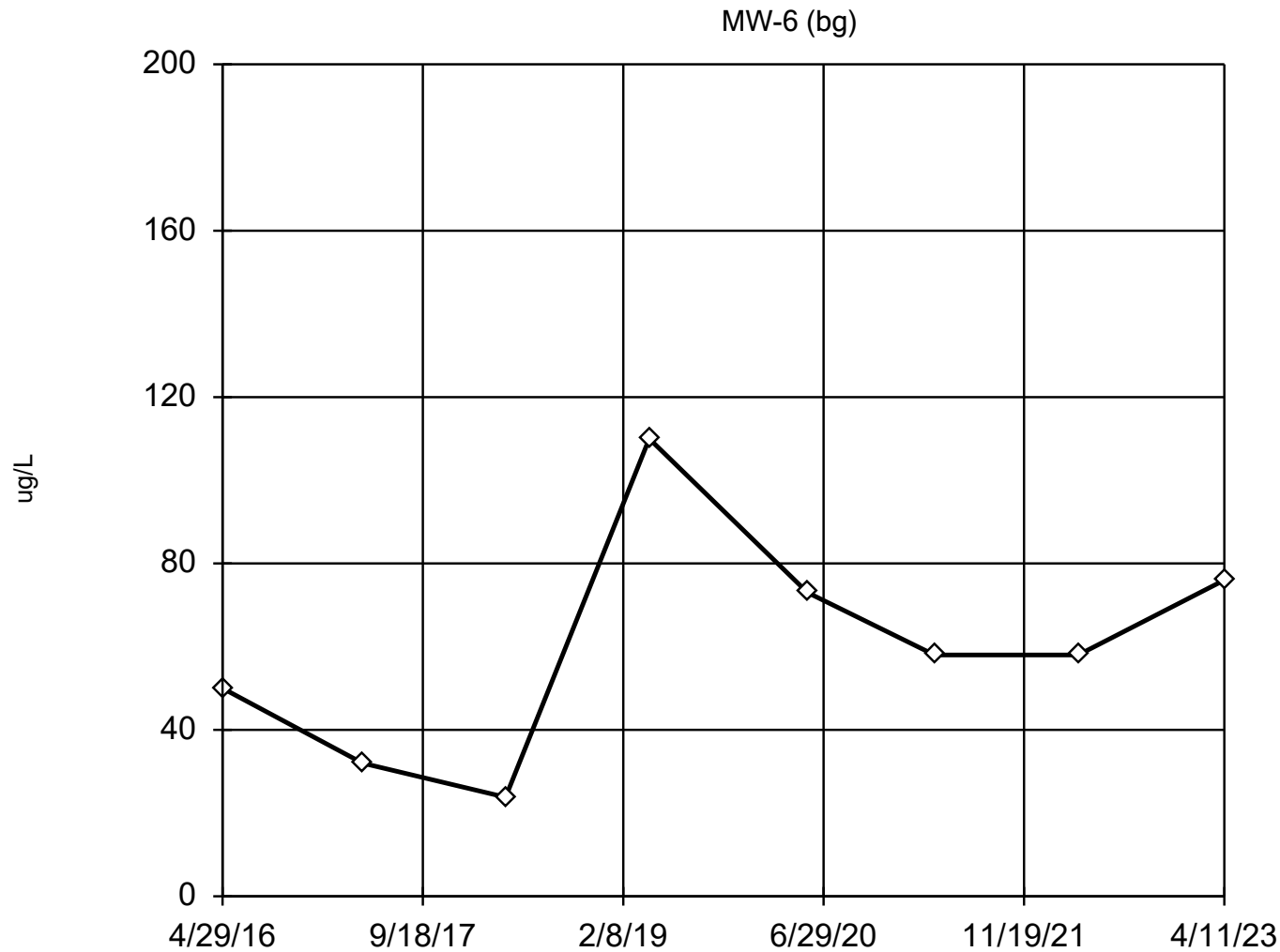
EPA 1989 Outlier Screening

Constituent: Barium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	44.2
4/19/2017	45.7
4/16/2018	44.9
4/15/2019	41 (B)
5/20/2020	47
4/7/2021	48
4/6/2022	47
4/11/2023	49

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 60.1, std. dev. 27.06,
critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9584
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Boron Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

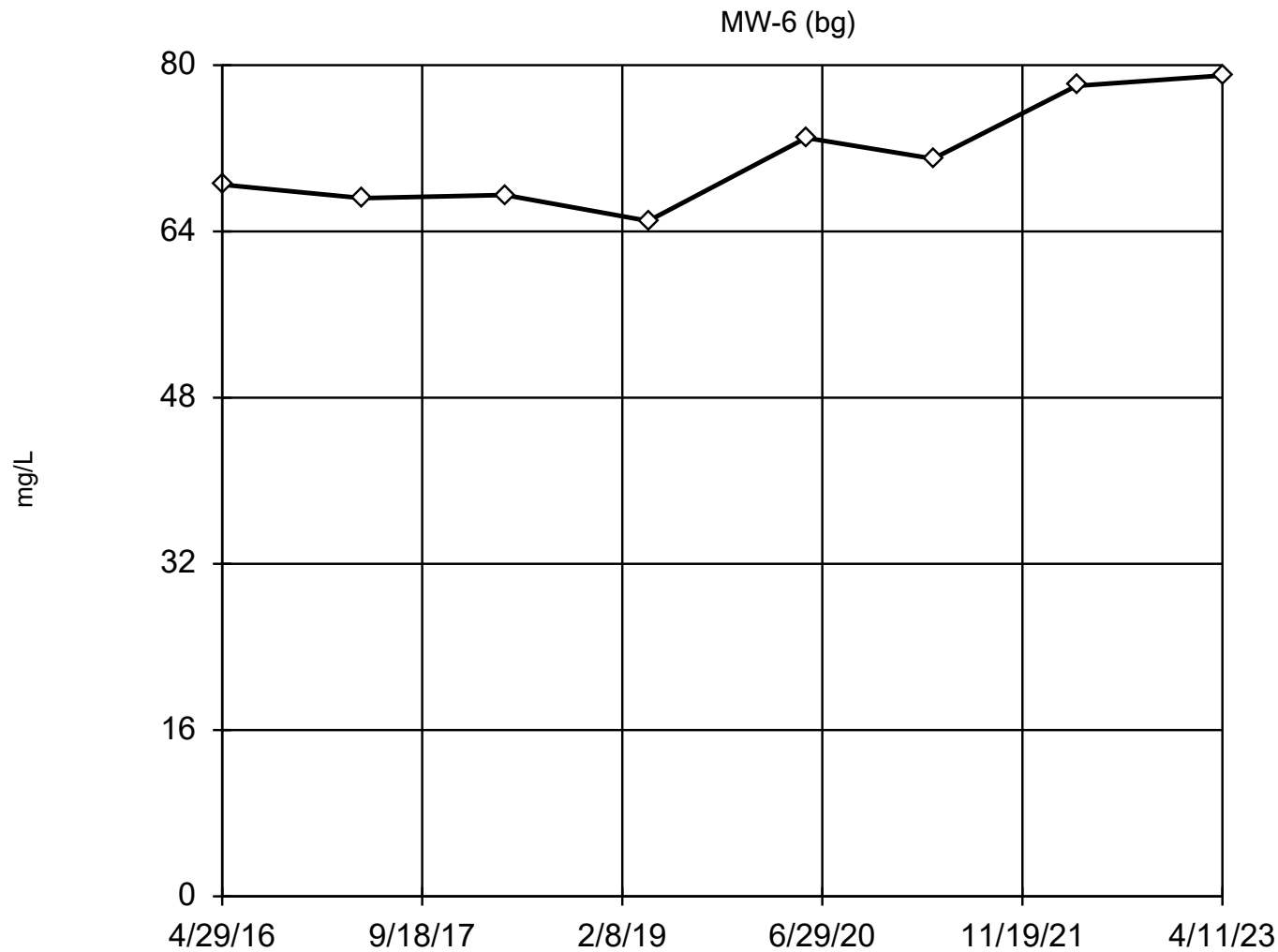
EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	<50
4/19/2017	32 (J,B)
4/16/2018	23.8 (J)
4/15/2019	<110
5/20/2020	<73
4/7/2021	<58
4/6/2022	<58 (U)
4/11/2023	<76 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 71.15, std. dev. 5.151, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9082
Critical = 0.851
The distribution was found to be normally distributed.

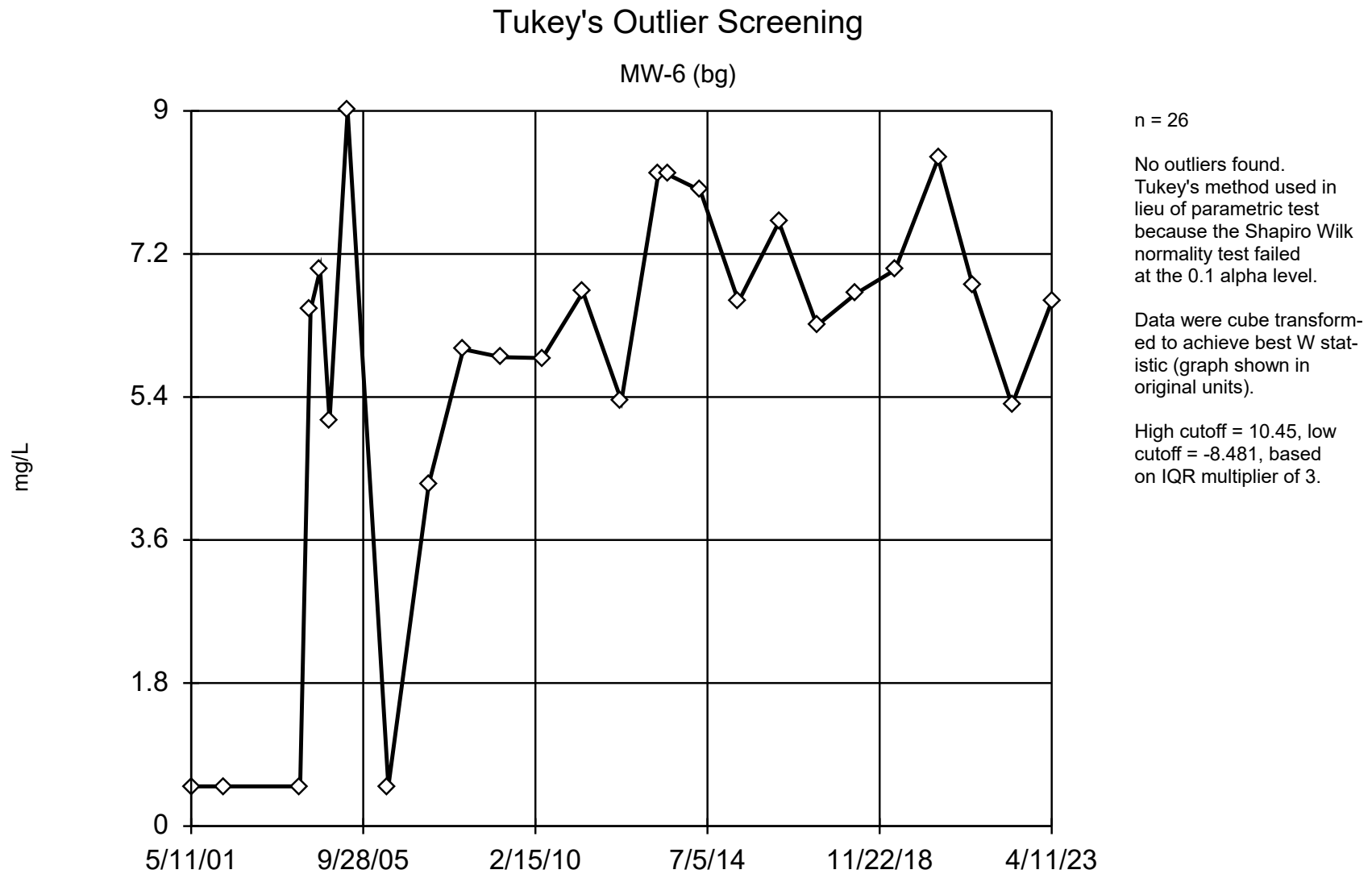
Constituent: Calcium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Calcium (mg/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	68.5
4/19/2017	67.2
4/16/2018	67.5
4/15/2019	65
5/20/2020	73
4/7/2021	71
4/6/2022	78
4/11/2023	79



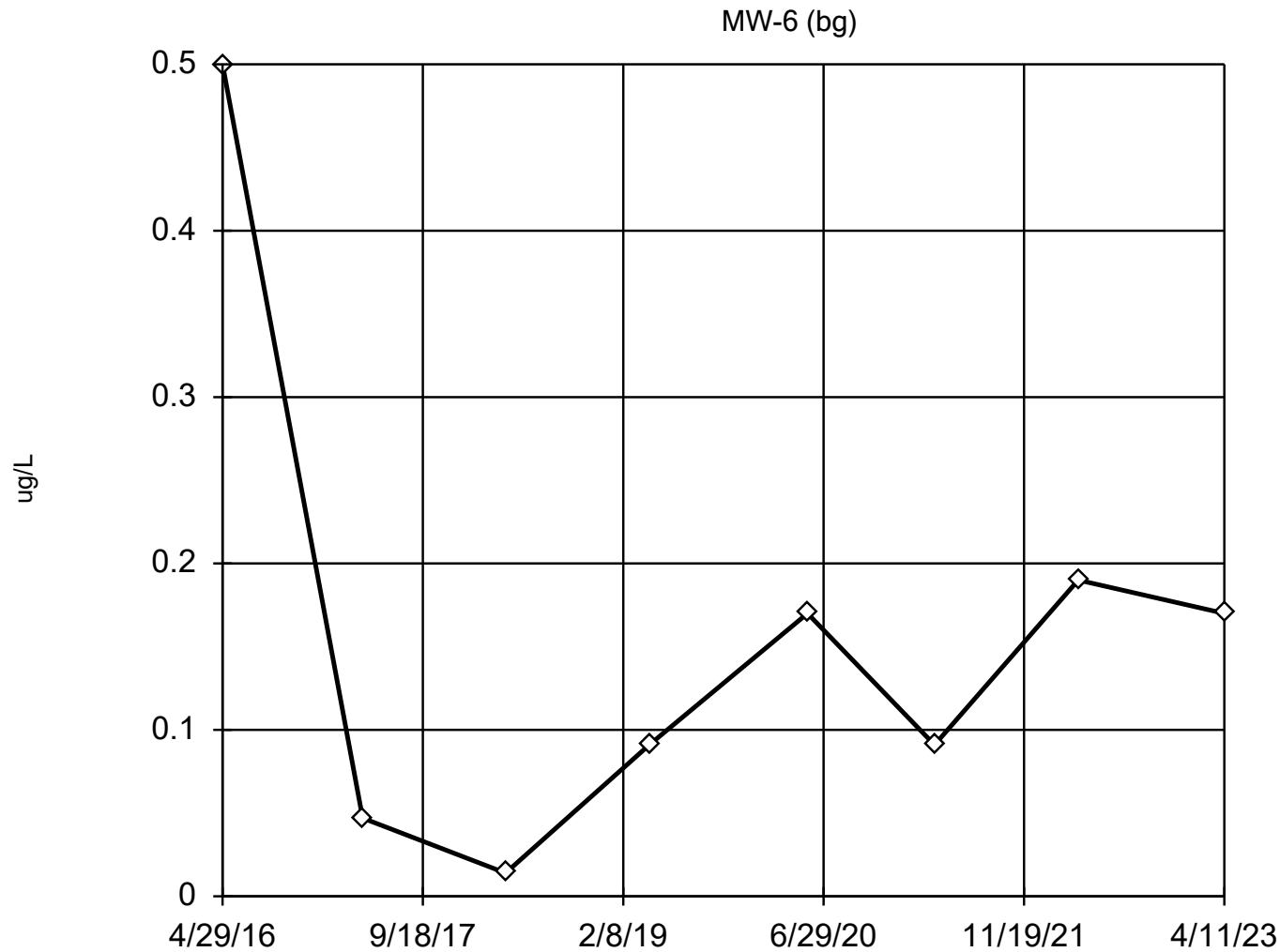
Constituent: Chloride Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Tukey's Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
5/11/2001	<0.5 (X)
3/8/2002	<0.5 (X)
2/19/2004	<0.5 (X)
5/26/2004	6.5
8/23/2004	7
11/18/2004	5.1
5/5/2005	9
5/19/2006	<0.5 (X)
5/30/2007	4.3
4/16/2008	6
4/3/2009	5.9
4/21/2010	5.89
5/4/2011	6.72
4/25/2012	5.35
4/2/2013	8.2
7/2/2013	8.2
4/29/2014	8
4/20/2015	6.6
4/29/2016	7.6
4/19/2017	6.3
4/16/2018	6.7
4/15/2019	7
5/20/2020	8.4
4/7/2021	6.8
4/6/2022	5.3
4/11/2023	6.6

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.1591, std. dev. 0.1513, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9454
Critical = 0.851 (after natural log transformation)
The distribution was found to be log-normal.

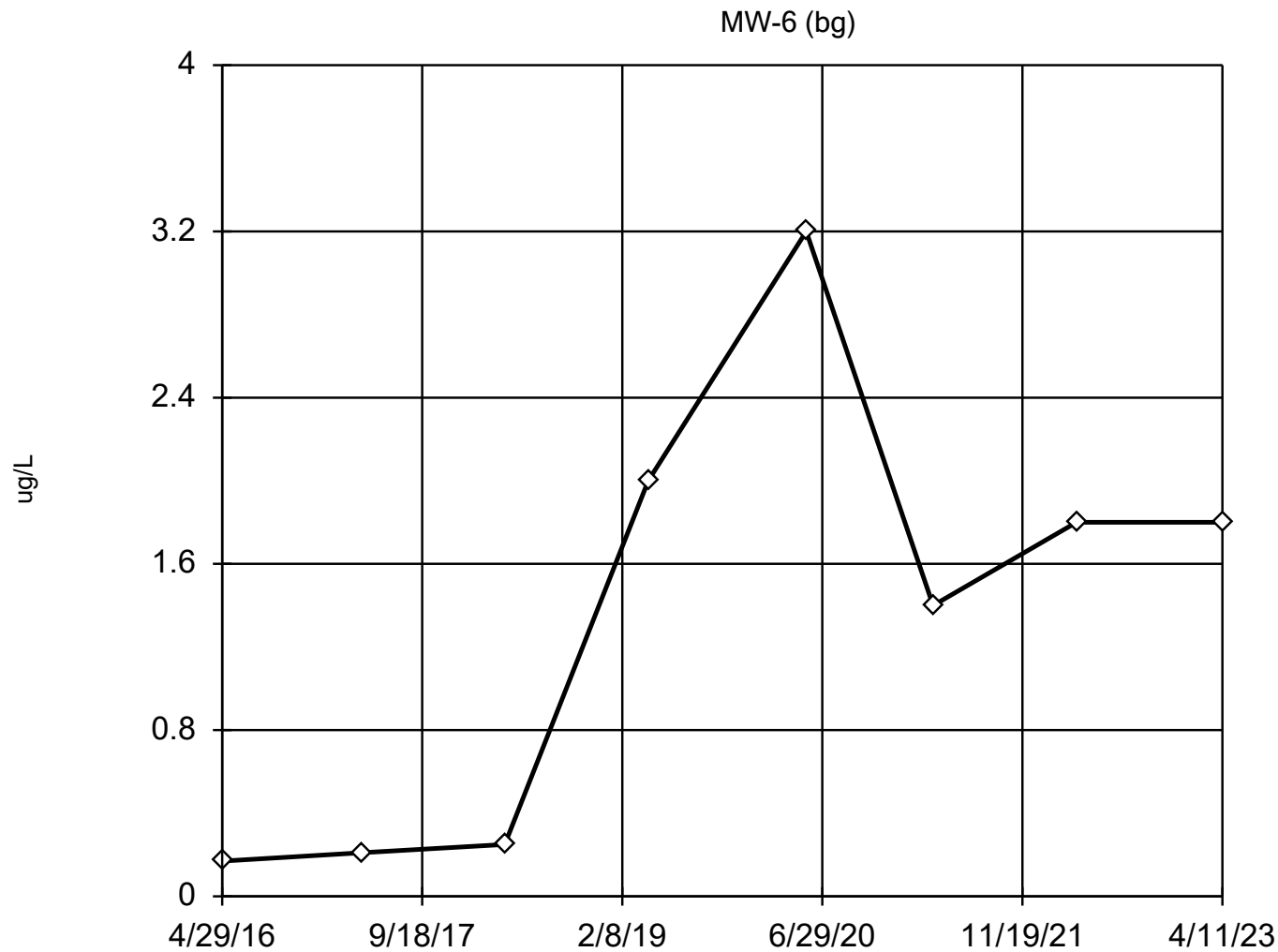
Constituent: Cobalt Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	<0.5
4/19/2017	0.047 (J,B)
4/16/2018	<0.014
4/15/2019	<0.091
5/20/2020	0.17 (J)
4/7/2021	<0.091
4/6/2022	<0.19 (U)
4/11/2023	<0.17 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.354, std. dev. 1.079, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8892
Critical = 0.851
The distribution was found to be normally distributed.

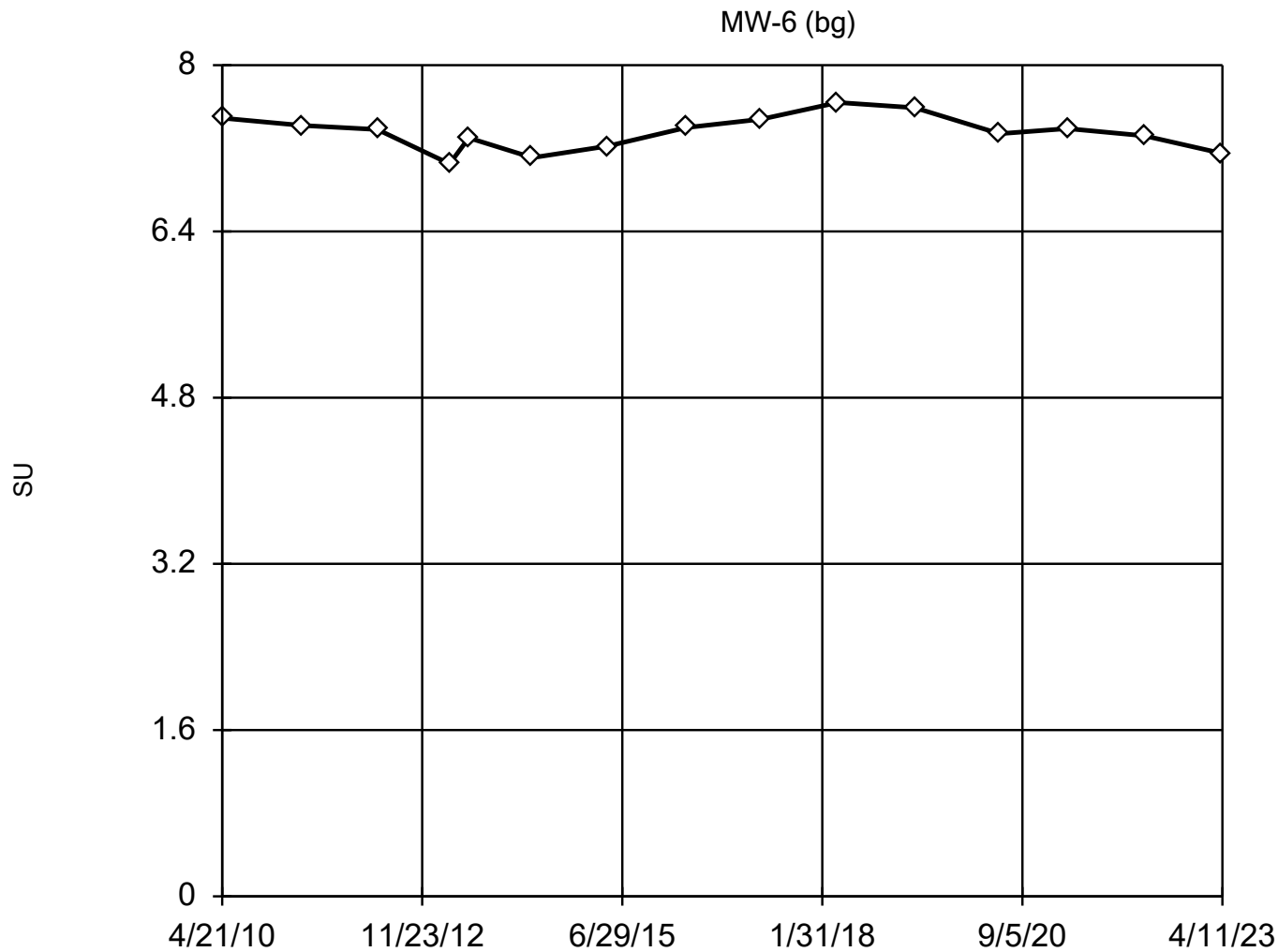
Constituent: Copper Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Copper (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	0.17 (J,Y)
4/19/2017	0.21 (J,B)
4/16/2018	0.25 (J,B)
4/15/2019	<2
5/20/2020	<3.2
4/7/2021	<1.4
4/6/2022	<1.8 (U)
4/11/2023	<1.8 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.352, std. dev. 0.1682, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9757
Critical = 0.901
The distribution was found to be normally distributed.

Constituent: Field pH Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

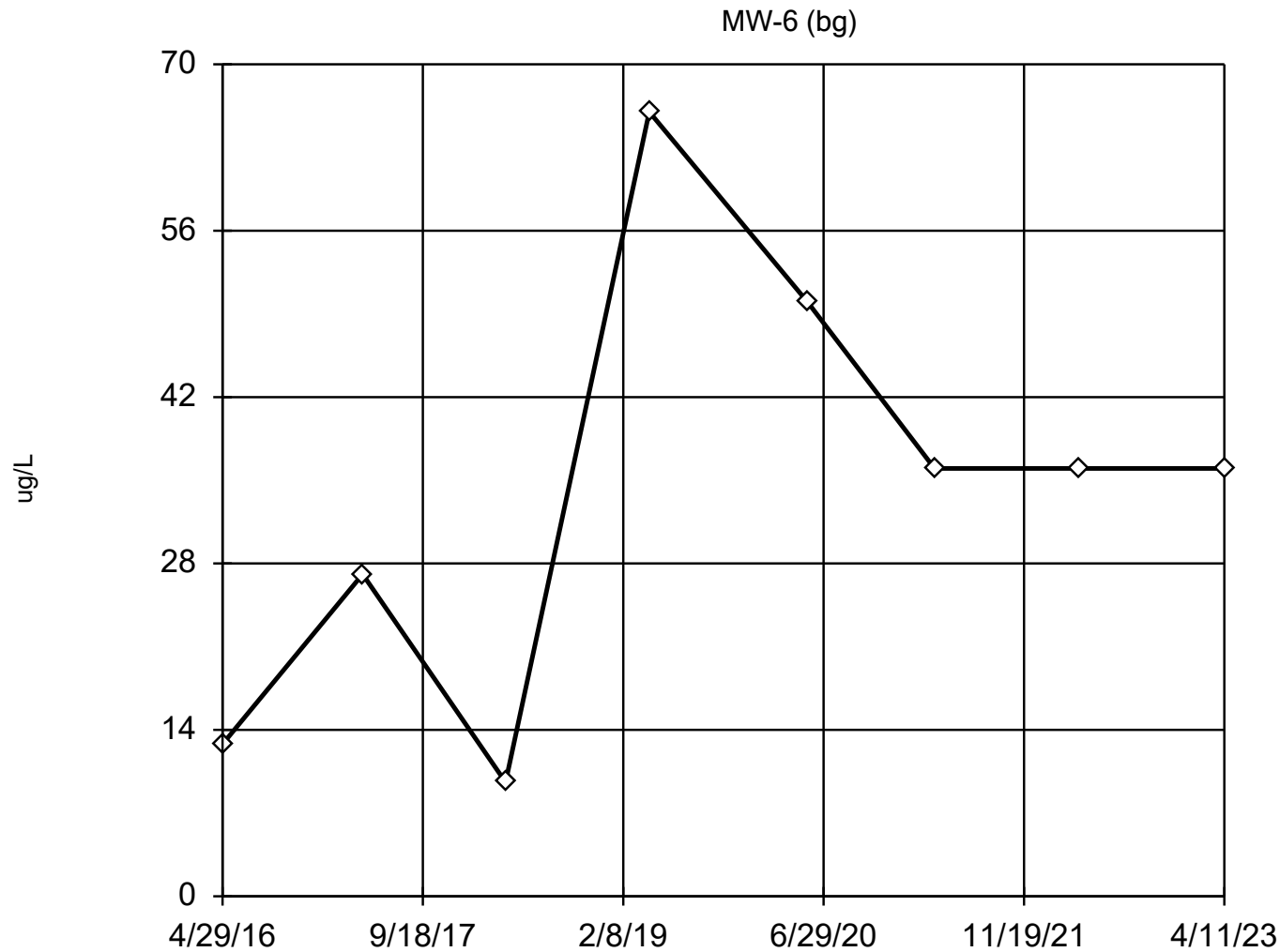
EPA 1989 Outlier Screening

Constituent: Field pH (SU) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/21/2010	7.49
5/4/2011	7.42
4/25/2012	7.38
4/2/2013	7.05
7/2/2013	7.3
4/29/2014	7.11
4/20/2015	7.22
4/29/2016	7.4
4/19/2017	7.48
4/16/2018	7.64
4/15/2019	7.59
5/20/2020	7.34
4/7/2021	7.39
4/6/2022	7.32
4/11/2023	7.15

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 34.19, std. dev. 18.46, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9446
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Iron Analysis Run 10/2/2023 8:47 AM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

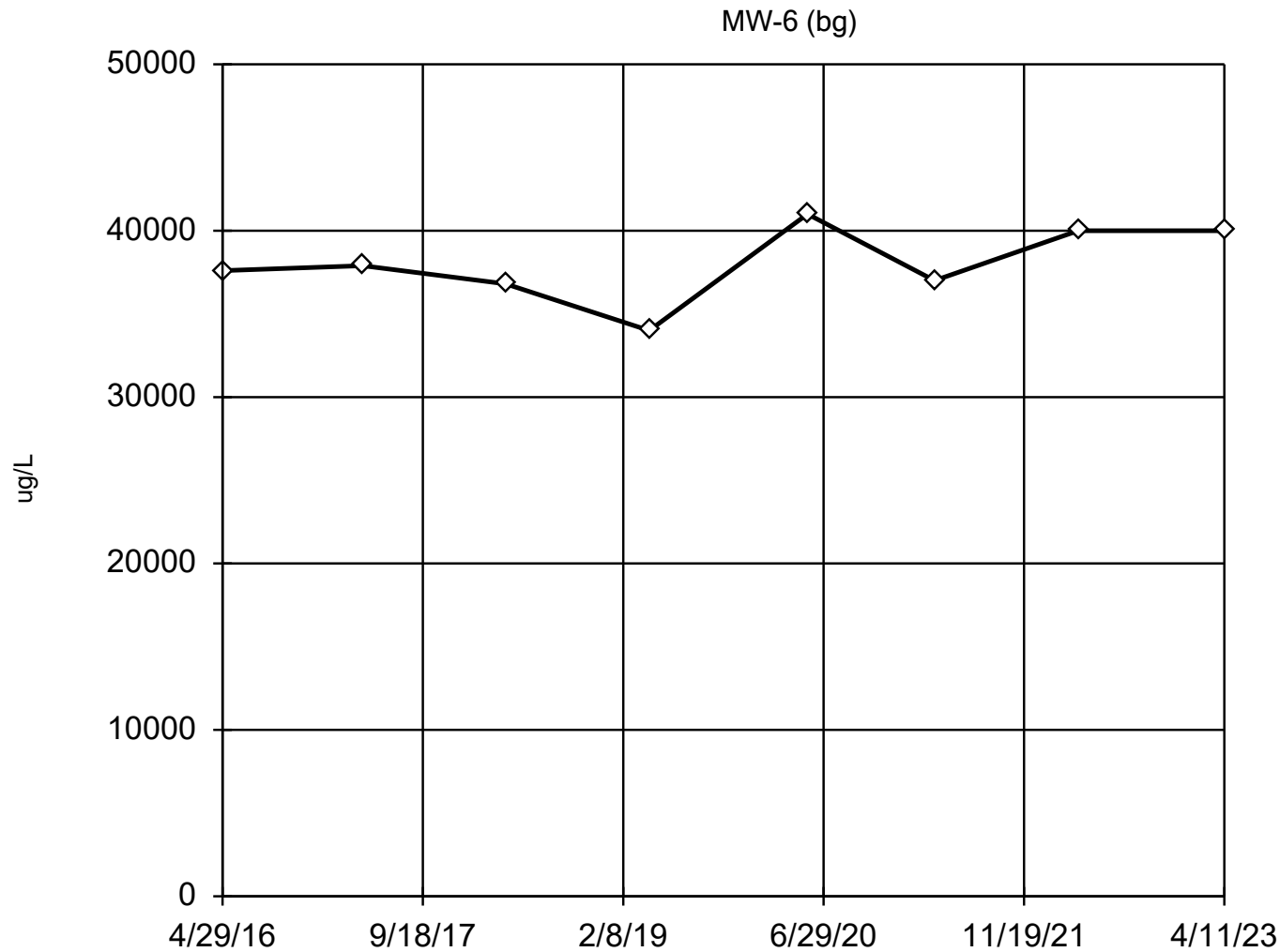
EPA 1989 Outlier Screening

Constituent: Iron (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	<12.8
4/19/2017	27.1 (J,B)
4/16/2018	<9.6
4/15/2019	<66
5/20/2020	<50
4/7/2021	<36
4/6/2022	<36 (U)
4/11/2023	<36 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 38038, std. dev. 2255, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9413
Critical = 0.851
The distribution was found to be normally distributed.

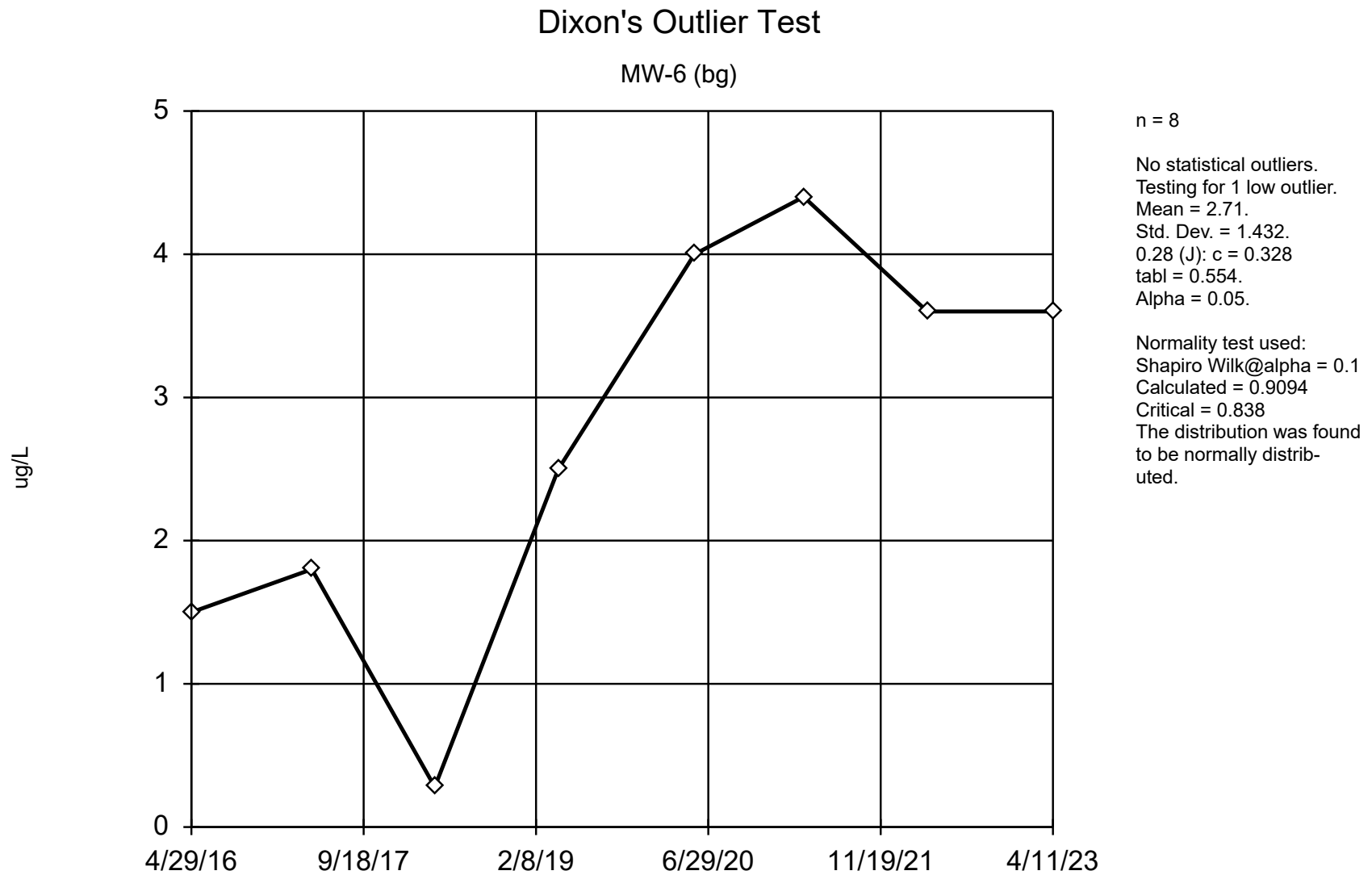
Constituent: Magnesium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Magnesium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	37600
4/19/2017	37900
4/16/2018	36800
4/15/2019	34000
5/20/2020	41000
4/7/2021	37000
4/6/2022	40000
4/11/2023	40000



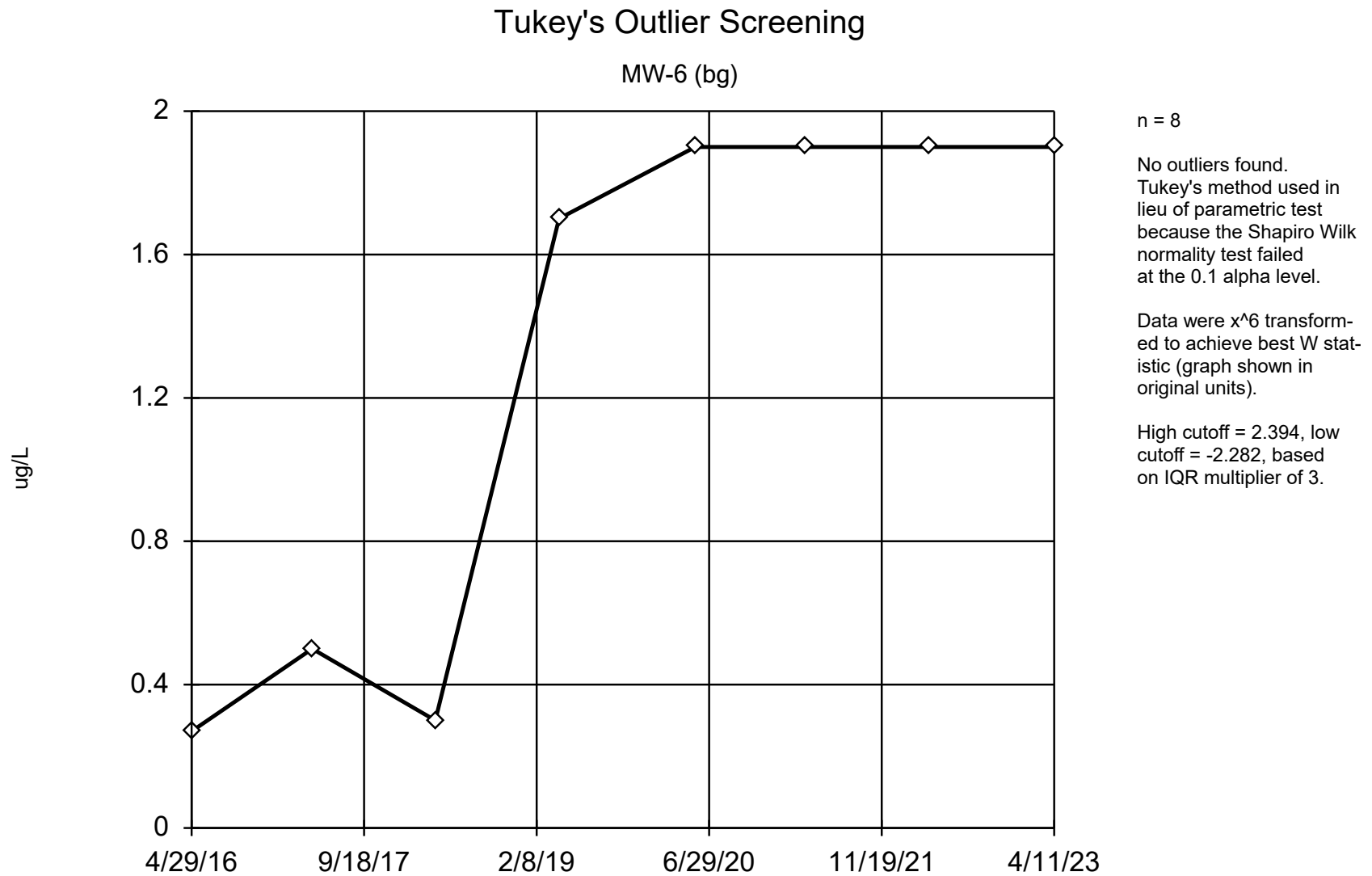
Constituent: Manganese Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Dixon's Outlier Test

Constituent: Manganese (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	1.5 (Y)
4/19/2017	1.8 (B)
4/16/2018	0.28 (J)
4/15/2019	<2.5
5/20/2020	<4
4/7/2021	<4.4
4/6/2022	<3.6 (U)
4/11/2023	<3.6 (U)



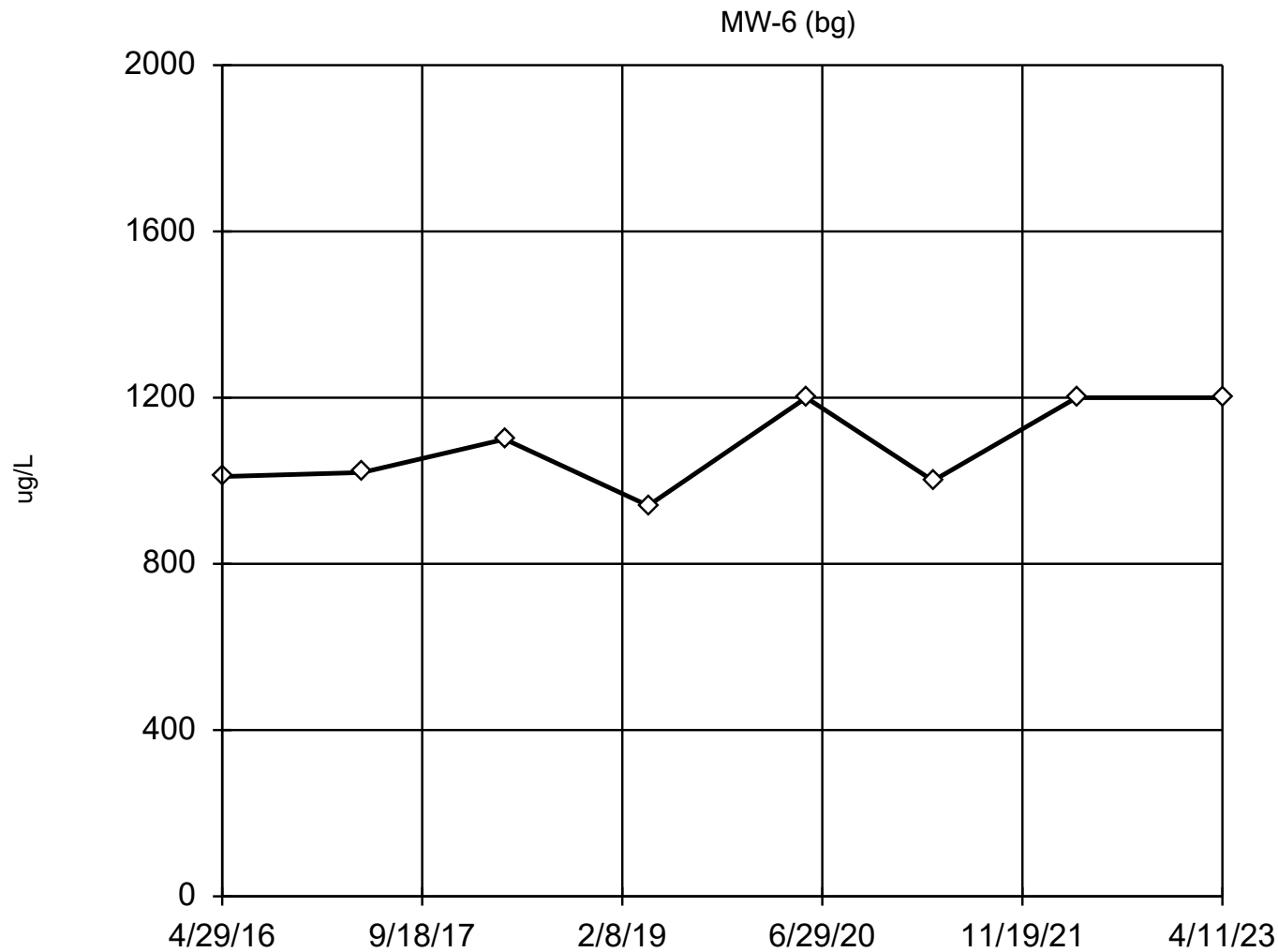
Constituent: Nickel Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Tukey's Outlier Screening

Constituent: Nickel (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	<0.27
4/19/2017	0.5 (J,B)
4/16/2018	0.3 (J)
4/15/2019	<1.7
5/20/2020	<1.9
4/7/2021	<1.9
4/6/2022	<1.9 (U)
4/11/2023	<1.9 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1084, std. dev. 105.6, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8551
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Potassium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

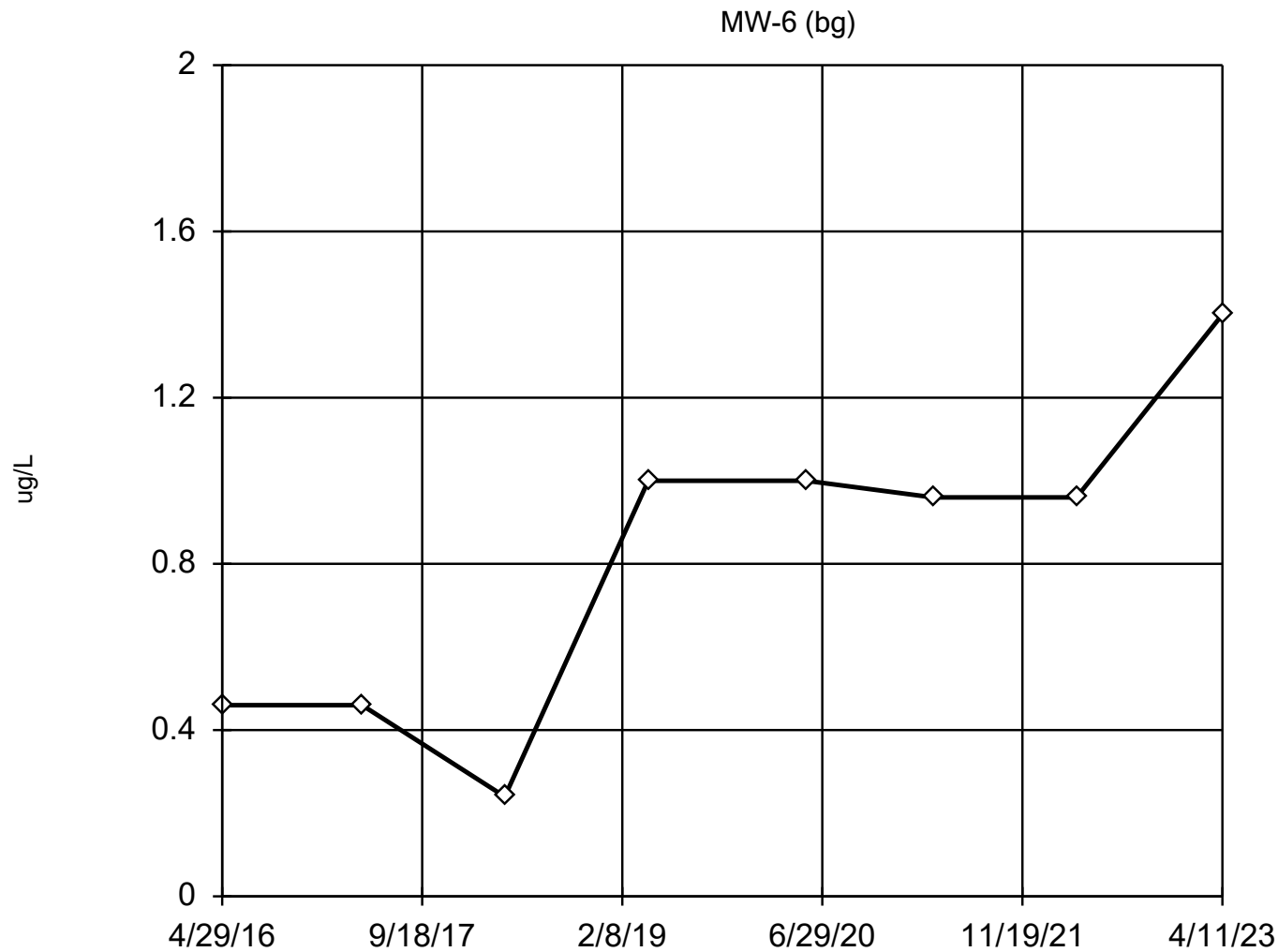
EPA 1989 Outlier Screening

Constituent: Potassium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	1010
4/19/2017	1020
4/16/2018	1100
4/15/2019	940
5/20/2020	1200
4/7/2021	1000
4/6/2022	1200
4/11/2023	1200

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.81, std. dev. 0.3846, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9033
Critical = 0.851
The distribution was found to be normally distributed.

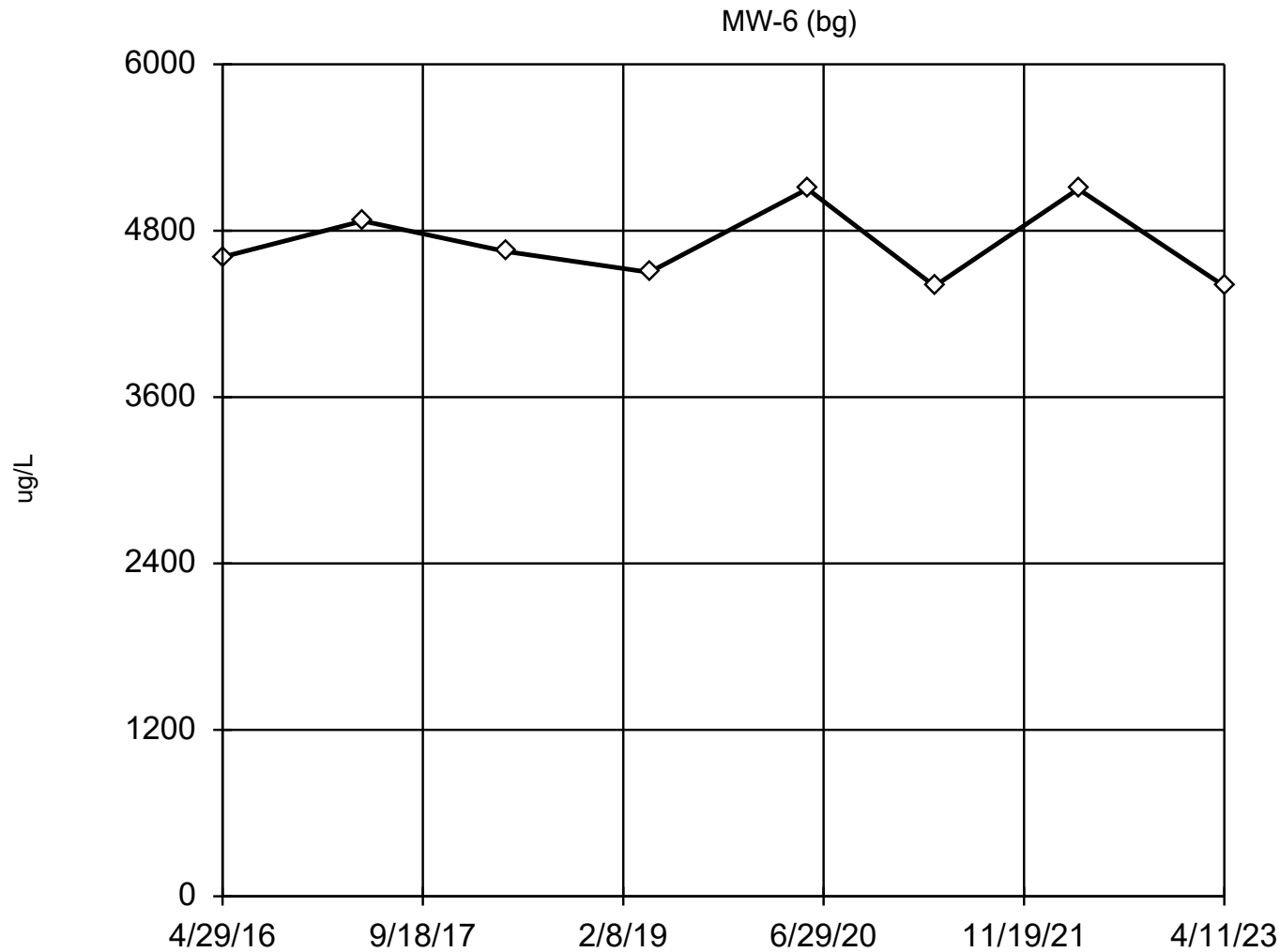
Constituent: Selenium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	0.46 (J)
4/19/2017	0.46 (J)
4/16/2018	0.24 (J)
4/15/2019	<1
5/20/2020	<1
4/7/2021	<0.96
4/6/2022	<0.96 (U)
4/11/2023	<1.4 (U)

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 4704, std. dev. 287.7, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8746
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Sodium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

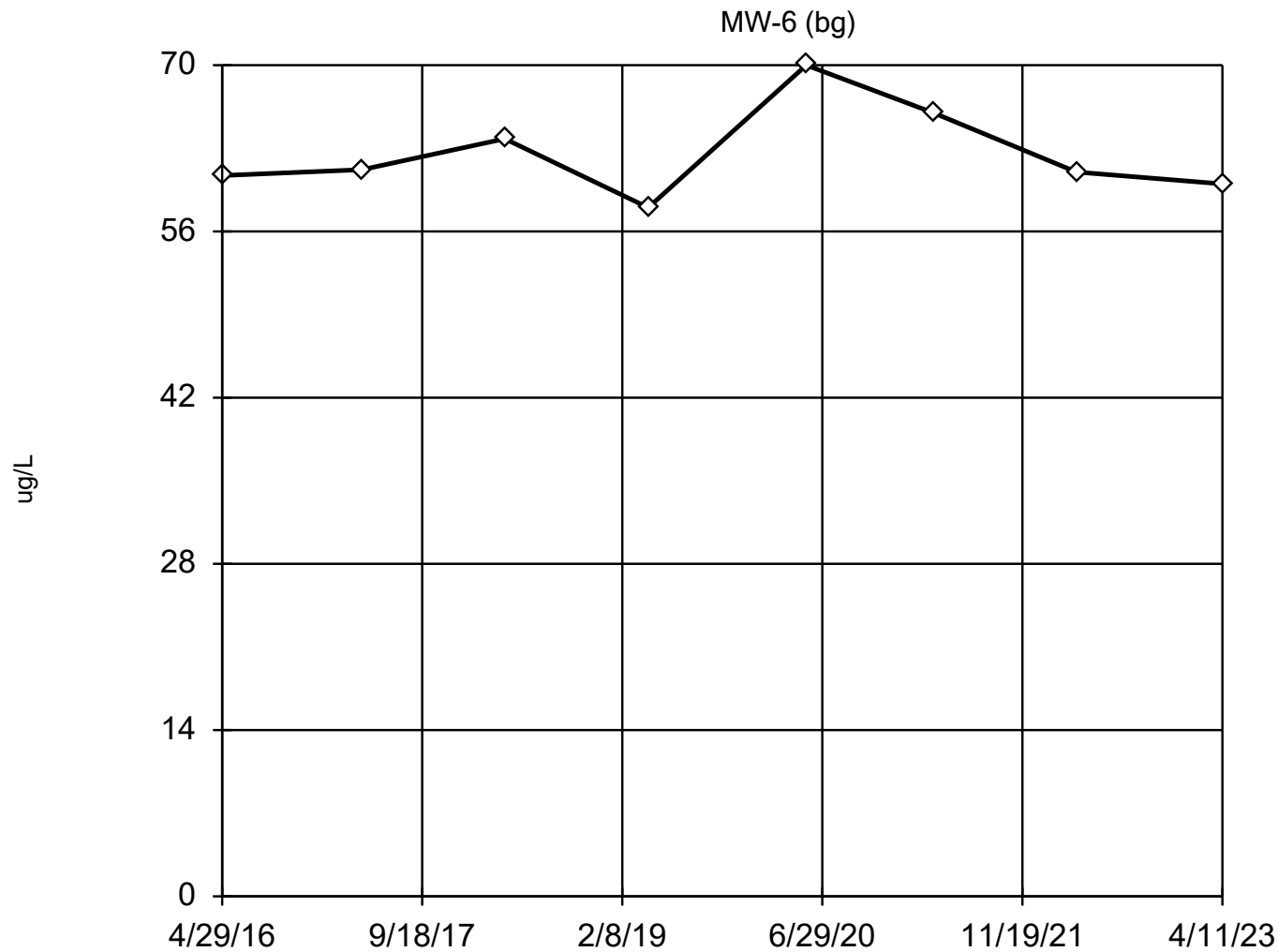
EPA 1989 Outlier Screening

Constituent: Sodium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/29/2016	4610
4/19/2017	4870
4/16/2018	4650
4/15/2019	4500
5/20/2020	5100
4/7/2021	4400
4/6/2022	5100
4/11/2023	4400

EPA Screening (suspected outliers for Dixon's Test)



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 62.59, std. dev. 3.851, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9087
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Strontium Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

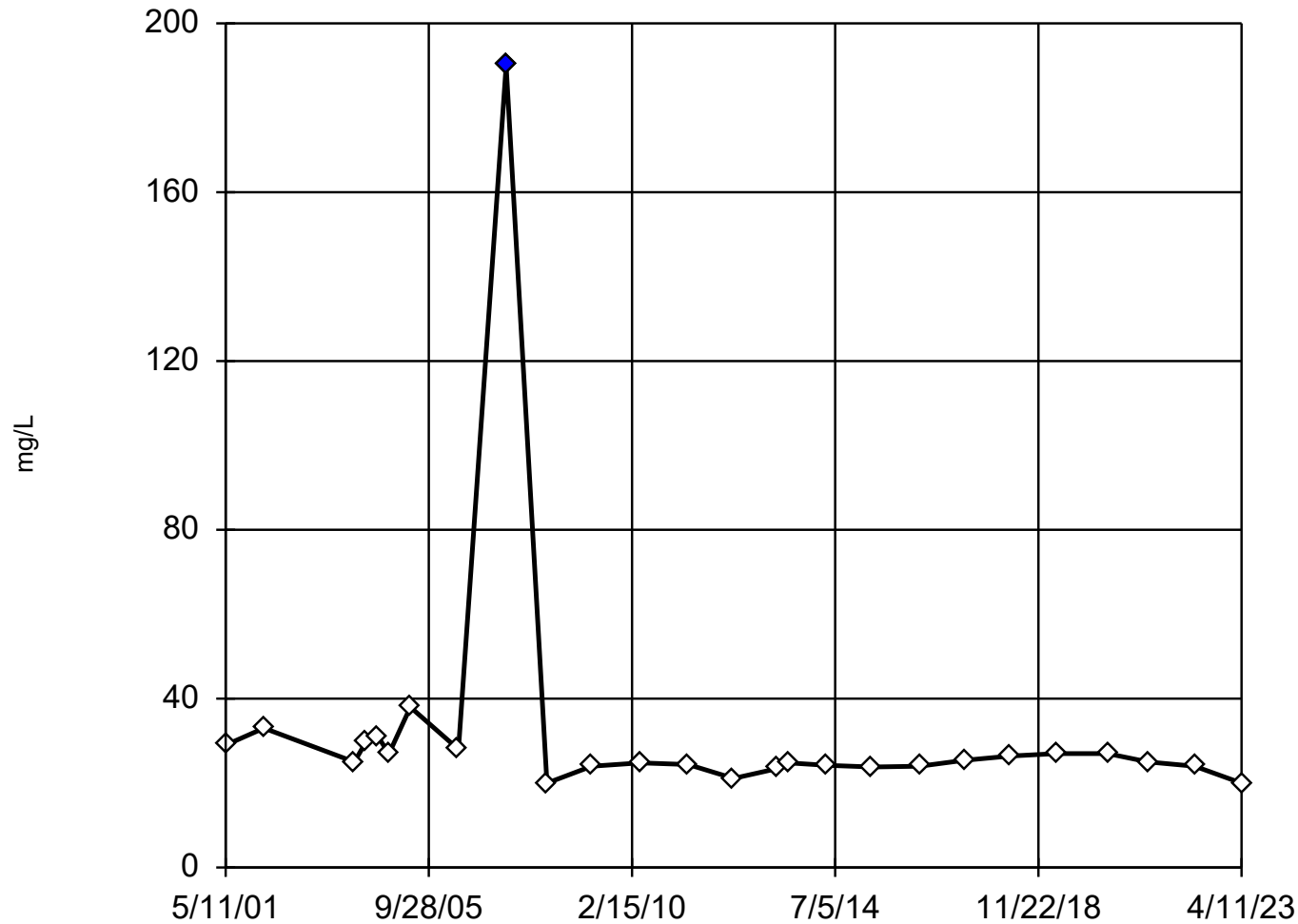
EPA 1989 Outlier Screening

Constituent: Strontium (ug/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	60.7 (Y)
4/19/2017	61.2 (N2)
4/16/2018	63.8 (N2)
4/15/2019	58
5/20/2020	70
4/7/2021	66
4/6/2022	61
4/11/2023	60

Rosner's Outlier Test

MW-6 (bg)



n = 26

Statistical outlier is
drawn as solid.

k = 2
r = 4.608
Tabulated value = 2.856
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9436
Critical = 0.931 (after
natural log transforma-
tion)
The distribution, after
removal of suspect val-
ue, was found to be log-
normal.

Constituent: Sulfate Analysis Run 10/2/2023 8:47 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

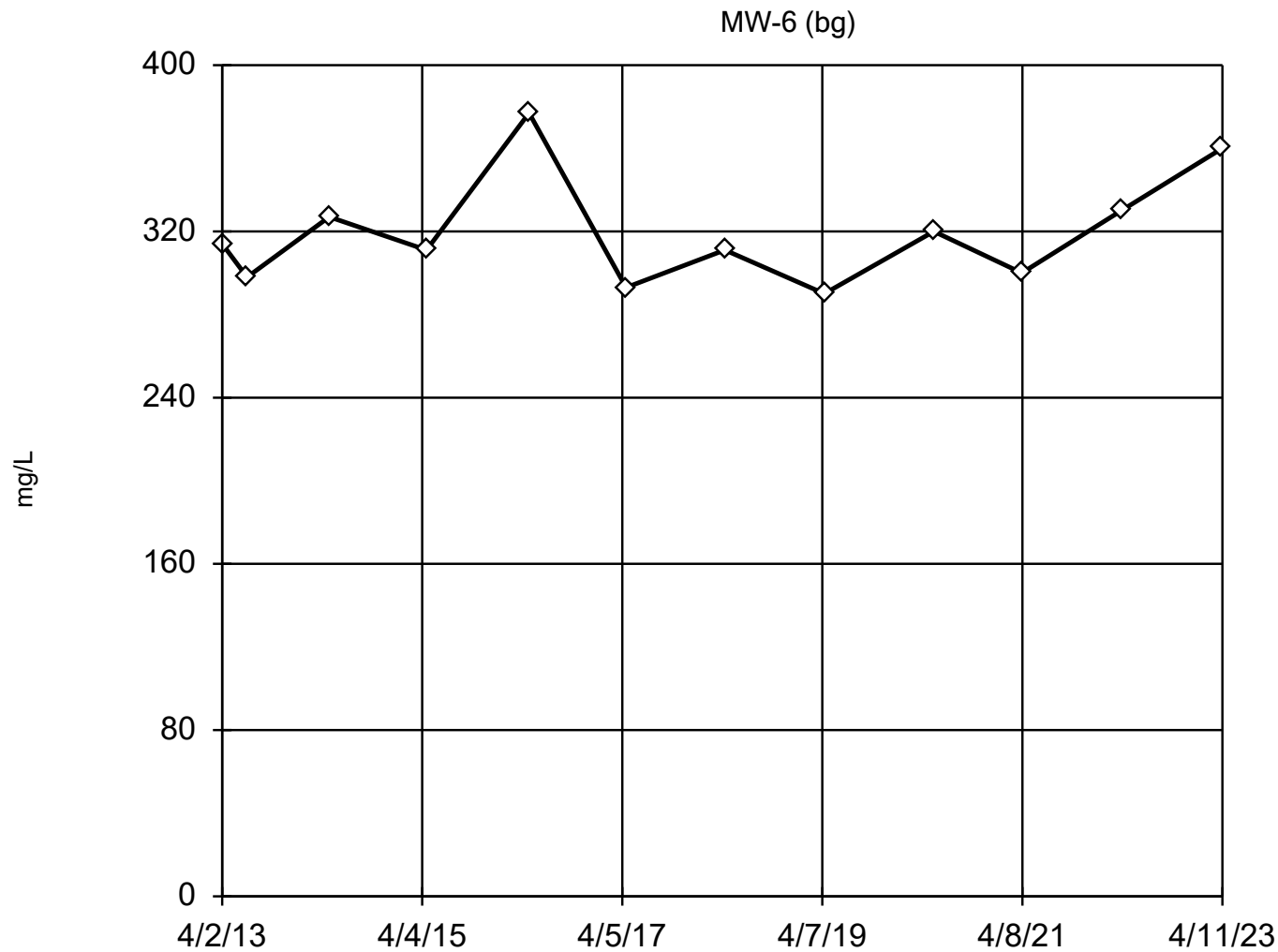
Rosner's Outlier Test

Constituent: Sulfate (mg/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

5/11/2001	29
3/8/2002	33
2/19/2004	25
5/26/2004	30
8/23/2004	31
11/18/2004	27
5/5/2005	38
5/19/2006	28 (J)
5/30/2007	190 (XO)
4/16/2008	20
4/3/2009	24
4/21/2010	24.8
5/4/2011	24.4
4/25/2012	21.1
4/2/2013	23.4
7/2/2013	24.8
4/29/2014	24.2
4/20/2015	23.8
4/29/2016	24
4/19/2017	25.4
4/16/2018	26.4
4/15/2019	27
5/20/2020	27
4/7/2021	25
4/6/2022	24
4/11/2023	20

EPA Screening (suspected outliers for Dixon's Test)



n = 12

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 319.3, std. dev. 26.46, critical Tn 2.285

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8863
Critical = 0.883
The distribution was found to be normally distributed.

Constituent: Total Alkalinity Analysis Run 10/2/2023 8:47 AM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

EPA 1989 Outlier Screening

Constituent: Total Alkalinity (mg/L) Analysis Run 10/2/2023 8:48 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-6 (bg)

4/2/2013	314
7/2/2013	298
4/29/2014	327
4/20/2015	311
4/29/2016	377
4/19/2017	293
4/16/2018	311
4/15/2019	290
5/20/2020	320
4/7/2021	300
4/6/2022	330
4/11/2023	360



Attachment D3

Interwell Prediction Limit Analysis Results

Prediction Limit

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions Printed 7/14/2023, 9:27 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Arsenic (ug/L)	MW-11R	0.880	n/a	4/10/2023	36	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-12	0.880	n/a	4/11/2023	22	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-12P	0.880	n/a	4/11/2023	0.53ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-13	0.880	n/a	4/7/2022	0.75ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-14	0.880	n/a	4/11/2023	0.53ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	MW-15	0.880	n/a	4/7/2022	0.75ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	TW-18	0.880	n/a	4/11/2023	0.94J	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Barium (ug/L)	MW-11R	53.4	n/a	4/10/2023	520	Yes	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	MW-12	53.4	n/a	4/11/2023	210	Yes	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	MW-12P	53.4	n/a	4/11/2023	91	Yes	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	MW-13	53.4	n/a	4/7/2022	49	No	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	MW-14	53.4	n/a	4/11/2023	40	No	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	MW-15	53.4	n/a	4/7/2022	100	Yes	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Barium (ug/L)	TW-18	53.4	n/a	4/11/2023	180	Yes	8	MW-6	45.85	2.517	0	None	No	0.000885	Param Inter 1 of 2
Boron (ug/L)	MW-11R	110	n/a	4/10/2023	280	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-12	110	n/a	4/11/2023	1400	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-12P	110	n/a	4/11/2023	2200	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-13	110	n/a	4/7/2022	990	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-14	110	n/a	4/11/2023	76ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	MW-15	110	n/a	4/7/2022	130	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Boron (ug/L)	TW-18	110	n/a	4/11/2023	190	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-11R	86.6	n/a	4/10/2023	190	Yes	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	MW-12	86.6	n/a	4/11/2023	76	No	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	MW-12P	86.6	n/a	4/11/2023	120	Yes	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	MW-13	86.6	n/a	4/7/2022	90	Yes	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	MW-14	86.6	n/a	4/11/2023	76	No	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	MW-15	86.6	n/a	4/7/2022	64	No	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Calcium (mg/L)	TW-18	86.6	n/a	4/11/2023	100	Yes	8	MW-6	71.15	5.151	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-11R	9.29	n/a	4/10/2023	16	Yes	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-12	9.29	n/a	4/11/2023	6	No	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-12P	9.29	n/a	4/11/2023	17	Yes	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-13	9.29	n/a	4/7/2022	18	Yes	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-14	9.29	n/a	4/11/2023	7	No	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	MW-15	9.29	n/a	4/7/2022	20	Yes	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Chloride (mg/L)	TW-18	9.29	n/a	4/11/2023	54	Yes	22	MW-6	6.703	1.185	0	None	No	0.000885	Param Inter 1 of 2
Cobalt (ug/L)	MW-11R	0.500	n/a	4/10/2023	7.3	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-12	0.500	n/a	4/11/2023	1.2	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-12P	0.500	n/a	4/11/2023	0.17ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-13	0.500	n/a	4/7/2022	0.85	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-14	0.500	n/a	4/11/2023	0.17ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-15	0.500	n/a	4/7/2022	0.19ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	TW-18	0.500	n/a	4/11/2023	2.9	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-11R	3.20	n/a	4/10/2023	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-12	3.20	n/a	4/11/2023	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-12P	3.20	n/a	4/11/2023	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-13	3.20	n/a	4/7/2022	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-14	3.20	n/a	4/11/2023	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	MW-15	3.20	n/a	4/7/2022	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Copper (ug/L)	TW-18	3.20	n/a	4/11/2023	1.8ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	MW-11R	66.0	n/a	4/10/2023	55000	Yes	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2

Prediction Limit

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions Printed 7/14/2023, 9:27 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Iron (ug/L)	MW-12	66.0	n/a	4/11/2023	6800	Yes	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	MW-12P	66.0	n/a	4/11/2023	36ND	No	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	MW-13	66.0	n/a	4/7/2022	280	Yes	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	MW-14	66.0	n/a	4/11/2023	36ND	No	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	MW-15	66.0	n/a	4/7/2022	36ND	No	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Iron (ug/L)	TW-18	66.0	n/a	4/11/2023	3200	Yes	8	MW-6	n/a	n/a	87.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Magnesium (ug/L)	MW-11R	44800	n/a	4/10/2023	120000	Yes	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	MW-12	44800	n/a	4/11/2023	34000	No	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	MW-12P	44800	n/a	4/11/2023	49000	Yes	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	MW-13	44800	n/a	4/7/2022	24000	No	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	MW-14	44800	n/a	4/11/2023	36000	No	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	MW-15	44800	n/a	4/7/2022	22000	No	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Magnesium (ug/L)	TW-18	44800	n/a	4/11/2023	37000	No	8	MW-6	38038	2255	0	None	No	0.000885	Param Inter 1 of 2
Manganese (ug/L)	MW-11R	4.40	n/a	4/10/2023	2800	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	MW-12	4.40	n/a	4/11/2023	1000	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	MW-12P	4.40	n/a	4/11/2023	3.6ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	MW-13	4.40	n/a	4/7/2022	32	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	MW-14	4.40	n/a	4/11/2023	3.6ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	MW-15	4.40	n/a	4/7/2022	3.6ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Manganese (ug/L)	TW-18	4.40	n/a	4/11/2023	2900	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-11R	1.90	n/a	4/10/2023	7.1	Yes	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-12	1.90	n/a	4/11/2023	3.6J	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-12P	1.90	n/a	4/11/2023	1.9ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-13	1.90	n/a	4/7/2022	1.9ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-14	1.90	n/a	4/11/2023	1.9ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	MW-15	1.90	n/a	4/7/2022	1.9ND	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Nickel (ug/L)	TW-18	1.90	n/a	4/11/2023	4.8J	No	8	MW-6	n/a	n/a	75	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Potassium (ug/L)	MW-11R	1400	n/a	4/10/2023	7800	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	MW-12	1400	n/a	4/11/2023	2500	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	MW-12P	1400	n/a	4/11/2023	6000	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	MW-13	1400	n/a	4/7/2022	1500	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	MW-14	1400	n/a	4/11/2023	1000	No	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	MW-15	1400	n/a	4/7/2022	1600	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Potassium (ug/L)	TW-18	1400	n/a	4/11/2023	1500	Yes	8	MW-6	1084	105.6	0	None	No	0.000885	Param Inter 1 of 2
Selenium (ug/L)	MW-11R	1.40	n/a	4/10/2023	1.4J	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-12	1.40	n/a	4/11/2023	1.4ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-12P	1.40	n/a	4/11/2023	2.9J	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-13	1.40	n/a	4/7/2022	8.4	Yes	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-14	1.40	n/a	4/11/2023	1.4ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	MW-15	1.40	n/a	4/7/2022	4J	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Selenium (ug/L)	TW-18	1.40	n/a	4/11/2023	1.4ND	No	8	MW-6	n/a	n/a	62.5	n/a	n/a	0.01836	NP Inter (NDs) 1 of 2
Sodium (ug/L)	MW-11R	5570	n/a	4/10/2023	26000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	MW-12	5570	n/a	4/11/2023	120000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	MW-12P	5570	n/a	4/11/2023	45000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	MW-13	5570	n/a	4/7/2022	16000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	MW-14	5570	n/a	4/11/2023	3300	No	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	MW-15	5570	n/a	4/7/2022	16000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Sodium (ug/L)	TW-18	5570	n/a	4/11/2023	42000	Yes	8	MW-6	4704	287.7	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	MW-11R	74.1	n/a	4/10/2023	520	Yes	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	MW-12	74.1	n/a	4/11/2023	70	No	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2

Prediction Limit

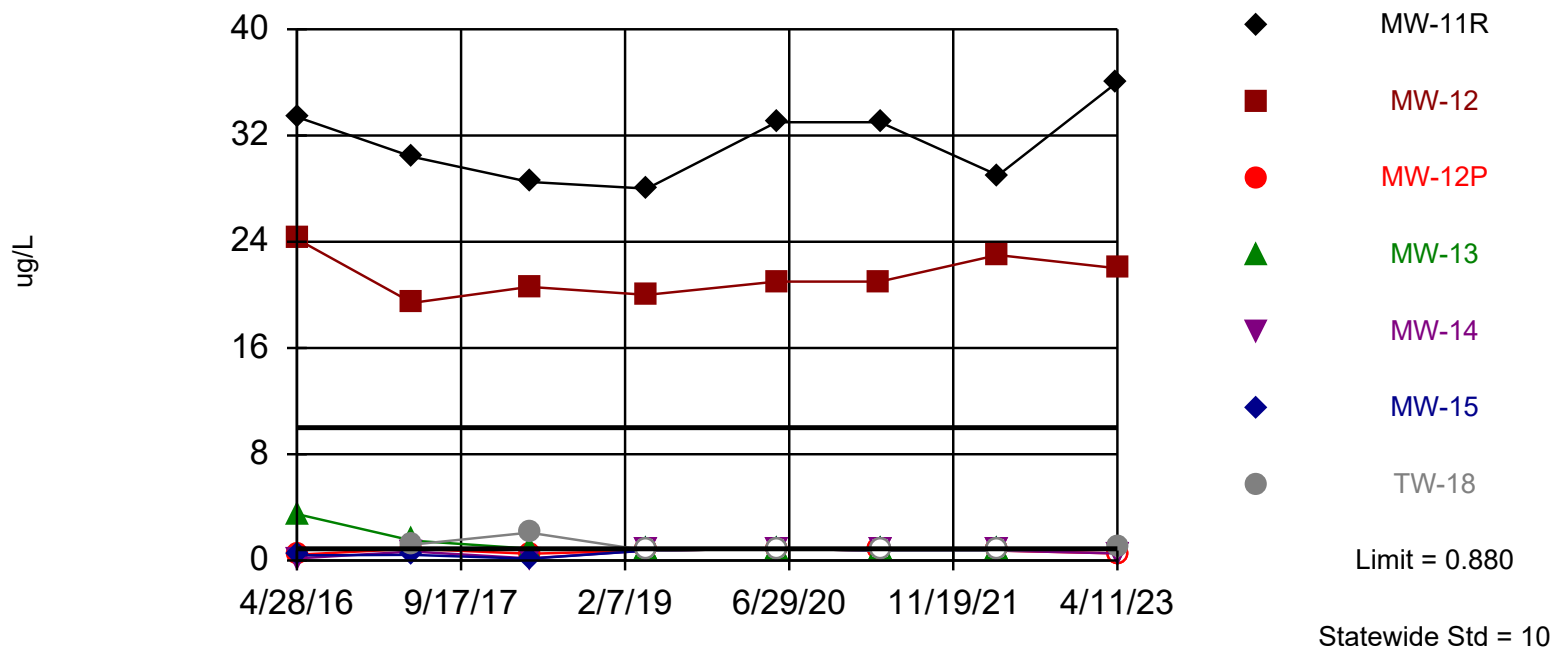
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions Printed 7/14/2023, 9:27 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Wells</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Strontium (ug/L)	MW-12P	74.1	n/a	4/11/2023	140	Yes	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	MW-13	74.1	n/a	4/7/2022	1000	Yes	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	MW-14	74.1	n/a	4/11/2023	58	No	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	MW-15	74.1	n/a	4/7/2022	330	Yes	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Strontium (ug/L)	TW-18	74.1	n/a	4/11/2023	150	Yes	8	MW-6	62.59	3.851	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-11R	34.5	n/a	4/10/2023	1.05ND	No	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-12	34.5	n/a	4/11/2023	210	Yes	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-12P	34.5	n/a	4/11/2023	170	Yes	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-13	34.5	n/a	4/7/2022	150	Yes	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-14	34.5	n/a	4/11/2023	18	No	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	MW-15	34.5	n/a	4/7/2022	45	Yes	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Sulfate (mg/L)	TW-18	34.5	n/a	4/11/2023	6.1	No	25	MW-6	26.01	3.983	0	None	No	0.000885	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-11R	386	253	4/10/2023	1100	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-12	386	253	4/11/2023	400	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-12P	386	253	4/11/2023	420	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-13	386	253	6/2/2022	140	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-14	386	253	4/11/2023	330	No	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	MW-15	386	253	6/2/2022	180	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2
Total Alkalinity (mg/L)	TW-18	386	253	4/11/2023	470	Yes	12	MW-6	319.3	26.46	0	None	No	0.0004425	Param Inter 1 of 2

Exceeds Limit: MW-11R, MW-12

Arsenic

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

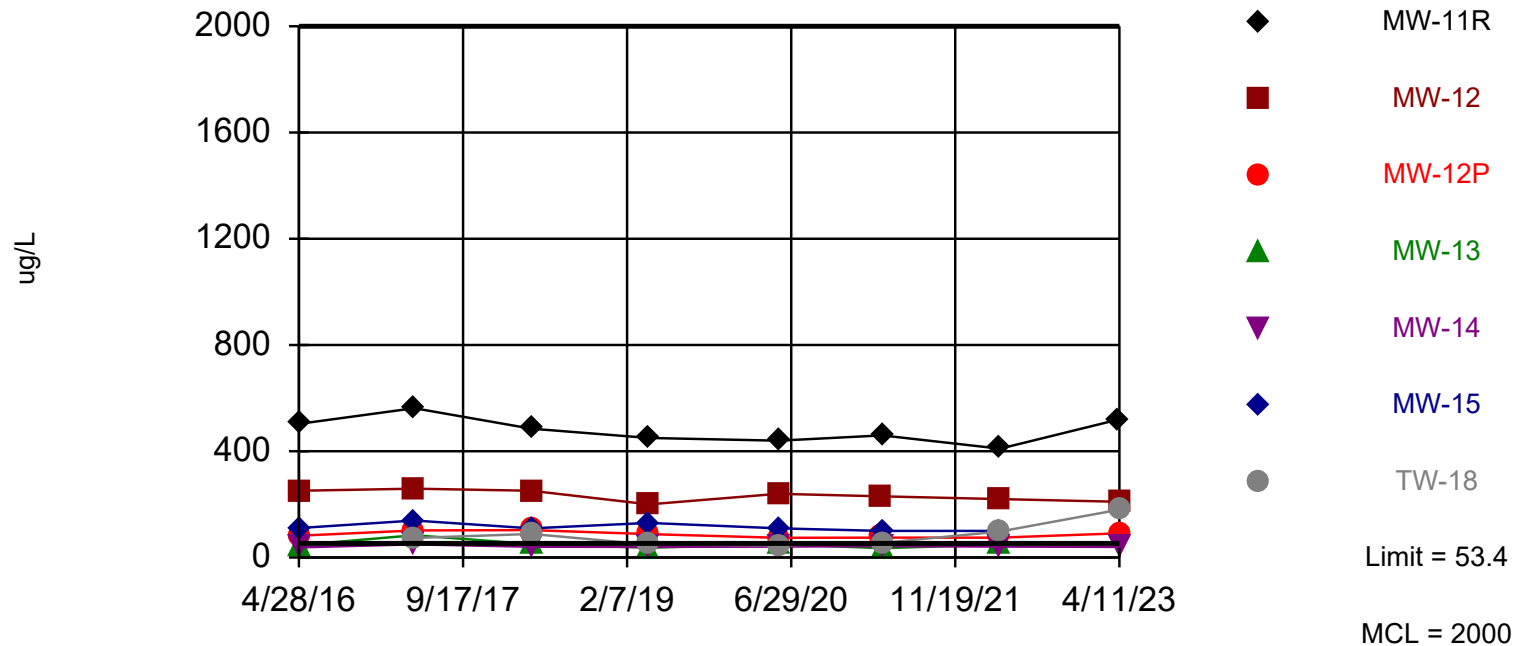
Constituent: Arsenic (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	33.4	24.2	3.5	0.44 (J)				
4/29/2016					0.26 (J)	0.39 (J)	0.16 (J)	
4/19/2017					0.27 (J)			
4/20/2017	30.4	19.4	1.5	0.88 (J)		0.42 (J)	0.68 (J)	1.2
4/16/2018					0.19 (J)			
4/17/2018	28.5	20.6	0.89 (J)	0.51 (J)		0.14 (J)	0.16 (J)	2.1
4/15/2019					<0.75		<0.75	
4/16/2019	28	20	<0.75	<0.75		<0.75		<0.75
5/20/2020					<0.88			
5/21/2020	33	21	<0.88	<0.88				
5/22/2020						<0.88	<0.88	<0.88
4/6/2021		21		<0.75				
4/7/2021	33		<0.75		<0.75	<0.75	<0.75	<0.75
4/6/2022		23		<0.75 (U)	<0.75 (U)		<0.75 (U)	<0.75 (U)
4/7/2022	29		<0.75 (U)			<0.75 (U)		
4/10/2023	36							
4/11/2023		22		<0.53 (U)	<0.53 (U)		<0.53 (U)	0.94 (J)

Exceeds Limit: MW-11R, MW-12, MW-12P,
MW-15, TW-18

Barium

Interwell Parametric



Background Data Summary: Mean=45.85, Std. Dev.=2.517, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9474, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit

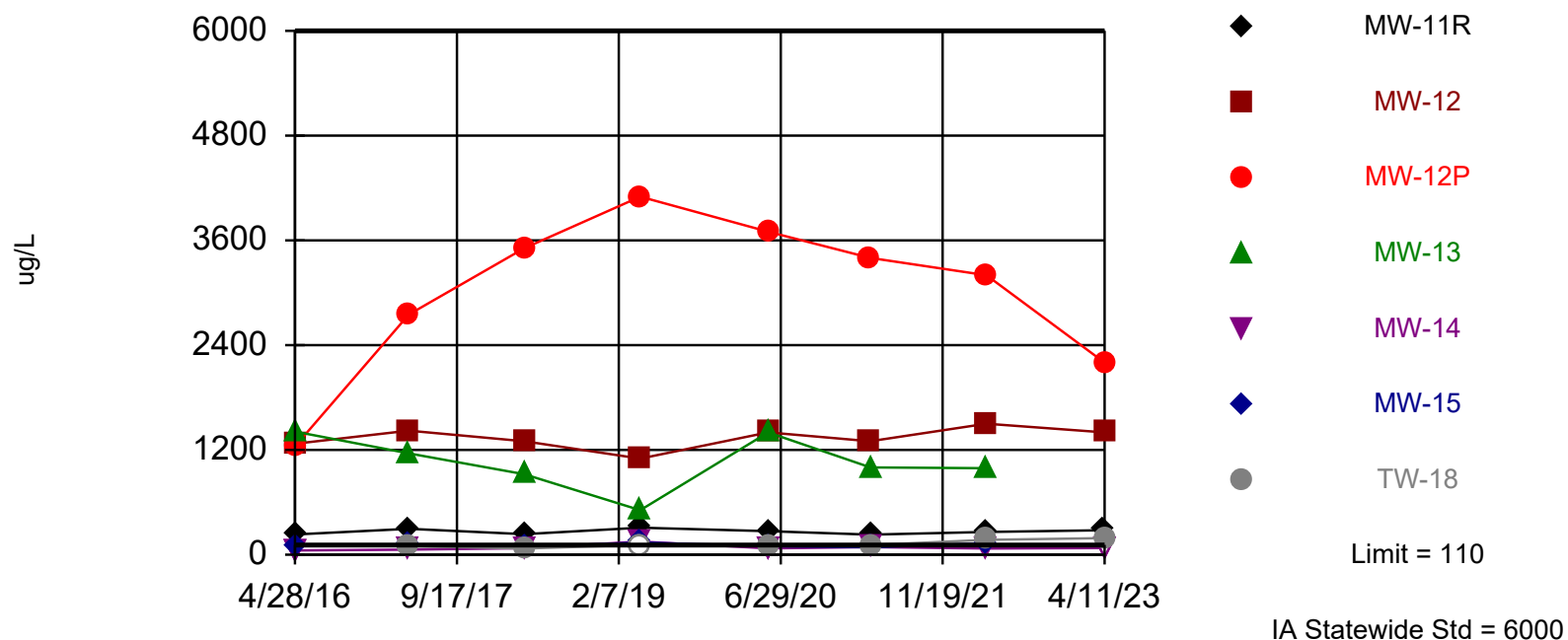
Constituent: Barium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	503	251	46.4	82.2				
4/29/2016					44.2	111	38.2	
4/19/2017					45.7			
4/20/2017	562	259	83.8	102		139	49.8	73.6
4/16/2018					44.9			
4/17/2018	485	251	50.5	103		110	40.6	88.4
4/15/2019					41 (B)		40 (B)	
4/16/2019	450 (B)	200 (B)	37 (B)	88 (B)		130 (B)		49 (B)
5/20/2020					47			
5/21/2020	440	240	50	74				
5/22/2020						110	41	45
4/6/2021		230		75				
4/7/2021	460		35		48	100	43	55
4/6/2022		220		75	47		41	98
4/7/2022	410		49			100		
4/10/2023	520							
4/11/2023		210		91	49		40	180

Exceeds Limit: MW-11R, MW-12, MW-12P,
MW-13, MW-15, TW-18

Boron

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 75% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

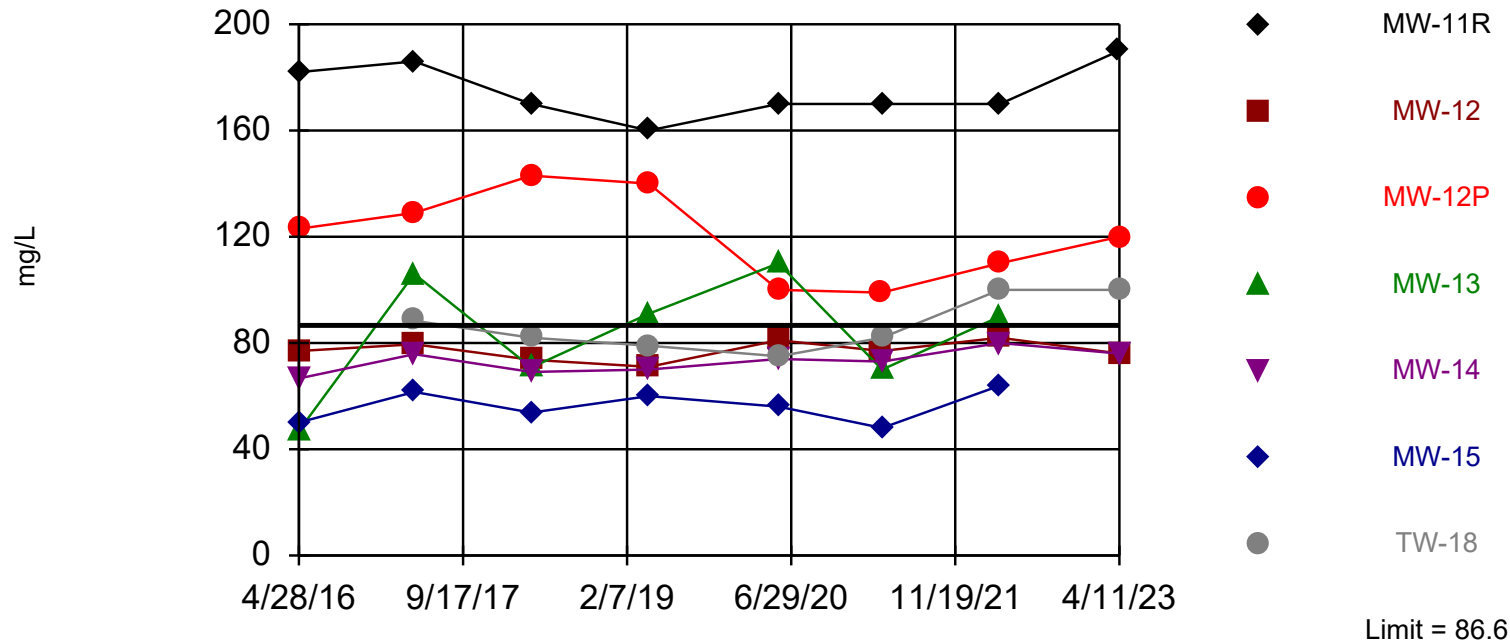
Constituent: Boron (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	231	1270	1410	1240				
4/29/2016					<50	97.1 (J)	<50	
4/19/2017					32 (J,B)			
4/20/2017	296	1420	1160	2750		116	57.3 (J)	97.6 (J)
4/16/2018					23.8 (J)			
4/17/2018	236	1300	922	3510		86.5 (J)	75 (J)	71.2 (J)
4/15/2019					<110		150 (J)	
4/16/2019	310	1100	510	4100		140 (J)		<110
5/20/2020					<73			
5/21/2020	270	1400	1400	3700				
5/22/2020						98 (J)	<73	110
4/6/2021		1300		3400				
4/7/2021	230		1000		<58	86 (J)	87 (J)	110
4/6/2022		1500		3200	<58 (U)		70 (J)	170
4/7/2022	260		990			130		
4/10/2023	280							
4/11/2023		1400		2200	<76 (U)		<76 (U)	190

Exceeds Limit: MW-11R, MW-12P, MW-13,
TW-18

Calcium

Interwell Parametric



Background Data Summary: Mean=71.15, Std. Dev.=5.151, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9082, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data

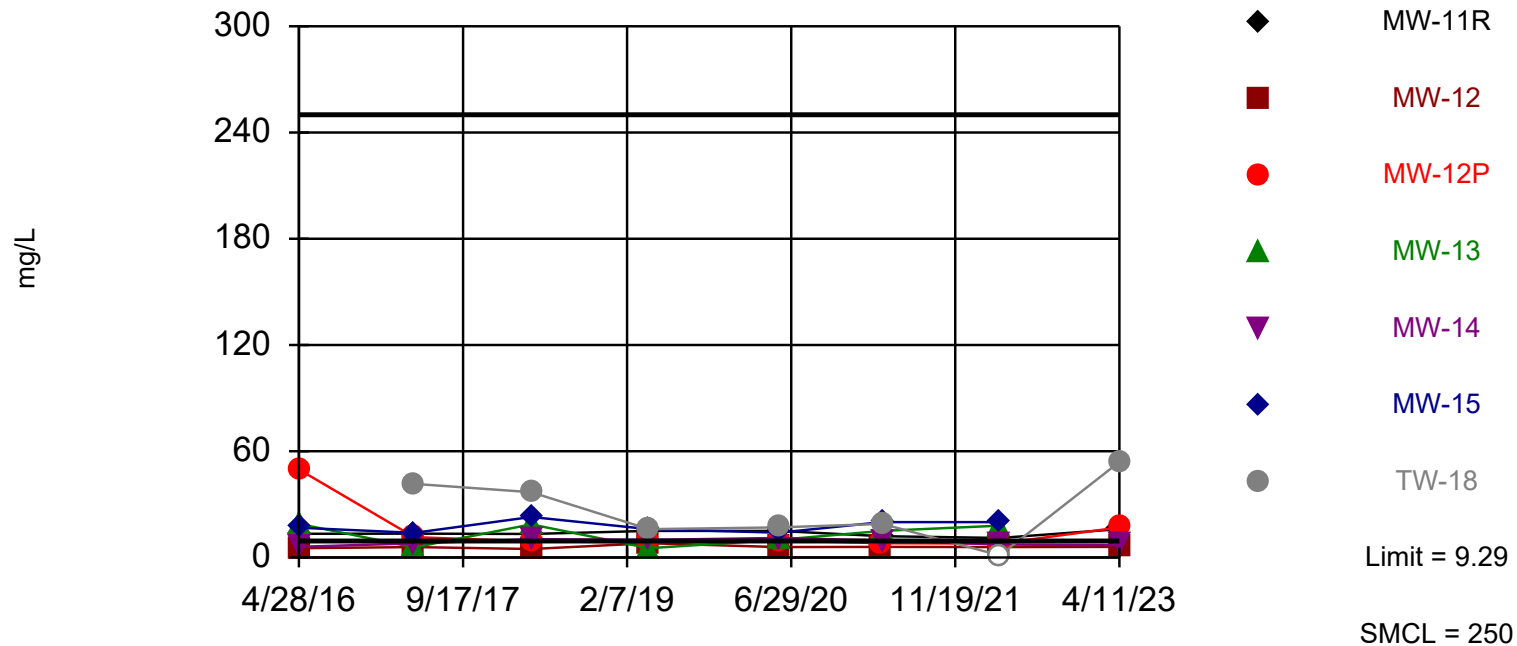
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	182	77	47	123				
4/29/2016					68.5	50.1	66.7	
4/19/2017					67.2			
4/20/2017	186	79.5	106	129		61.6	75.8	88.4
4/16/2018					67.5			
4/17/2018	170 (M1)	73.7	70.8	143		53.8	69.1	82
4/15/2019					65		70	
4/16/2019	160	71	91	140		60		79
5/20/2020					73			
5/21/2020	170	81	110	100				
5/22/2020						56	74	75
4/6/2021		77		99				
4/7/2021	170		70		71	48	73	82
4/6/2022		82		110	78		80	100
4/7/2022	170		90			64		
4/10/2023	190							
4/11/2023		76		120	79		76	100

Exceeds Limit: MW-11R, MW-12P, MW-13,
MW-15, TW-18

Chloride

Interwell Parametric



Background Data Summary: Mean=6.703, Std. Dev.=1.185, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9782, critical = 0.878. Kappa = 2.187 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit

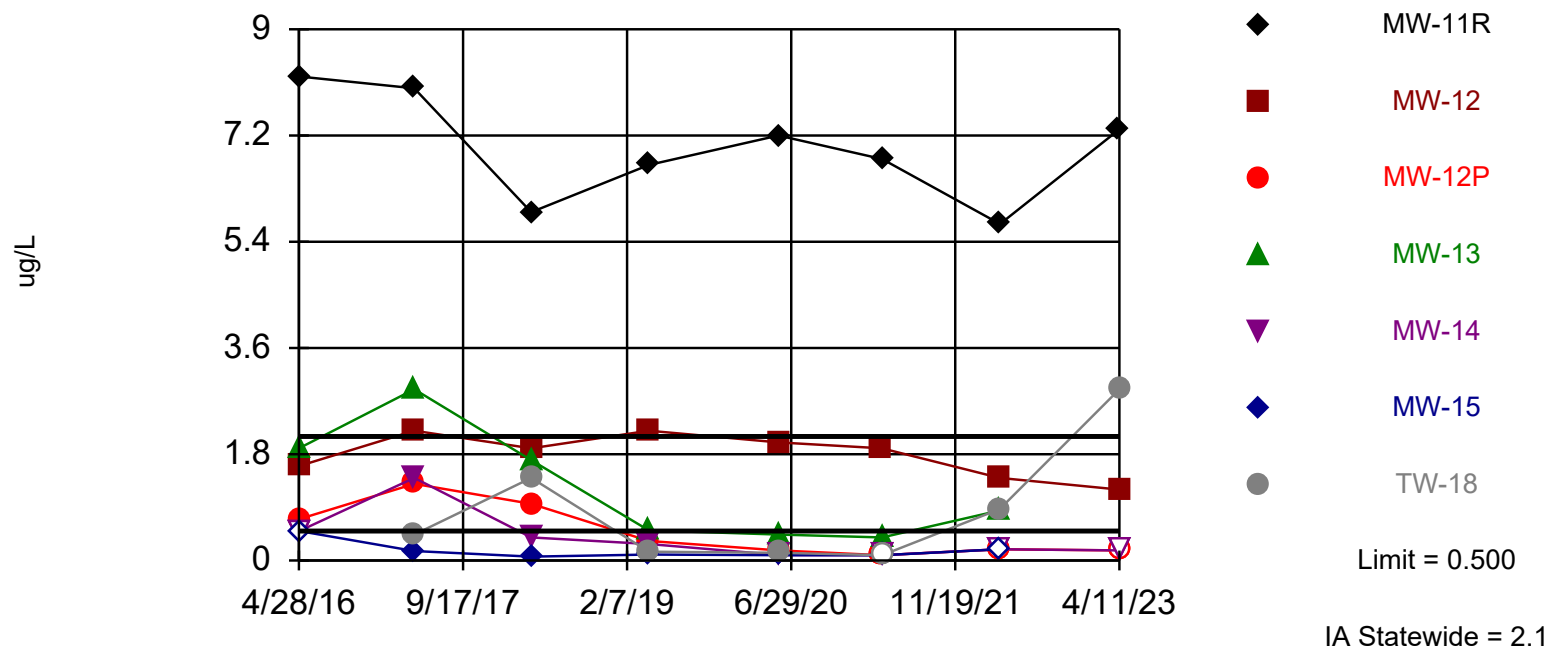
Constituent: Chloride (mg/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)	MW-12P	MW-11R	MW-12	MW-13	MW-15	MW-14	TW-18
5/11/2001	<0.5 (X)							
3/8/2002	<0.5 (X)							
2/19/2004	<0.5 (X)							
5/26/2004	6.5							
8/23/2004	7							
11/18/2004	5.1							
5/5/2005	9							
5/19/2006	<0.5 (X)							
5/30/2007	4.3							
4/16/2008	6							
4/3/2009	5.9							
4/21/2010	5.89							
5/4/2011	6.72							
4/25/2012	5.35							
4/2/2013	8.2							
7/2/2013	8.2							
4/29/2014	8							
4/20/2015	6.6							
4/28/2016		49.7	13.4	5.3	19			
4/29/2016	7.6					16.8	6.1	
4/19/2017	6.3							
4/20/2017		11.5	13.5	5.9	5.7	13.9	8	41.6
4/16/2018	6.7							
4/17/2018		9.1	13.3	4.8	18.7	22.9	10.3	36.9
4/15/2019	7						10	
4/16/2019		8.5	15	8.1	5.3	16		16
5/20/2020	8.4							
5/21/2020		9.6	15	5.9	10			
5/22/2020						14	11	17
4/6/2021		8.1		6				
4/7/2021	6.8		12		15	20	9.6	19
4/6/2022	5.3	7.9		5.9			7.3	<2.3 (U)
4/7/2022			11		18	20		
4/10/2023			16					
4/11/2023	6.6	17		6			7	54

Exceeds Limit: MW-11R, MW-12, MW-13,
TW-18

Cobalt

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 75% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

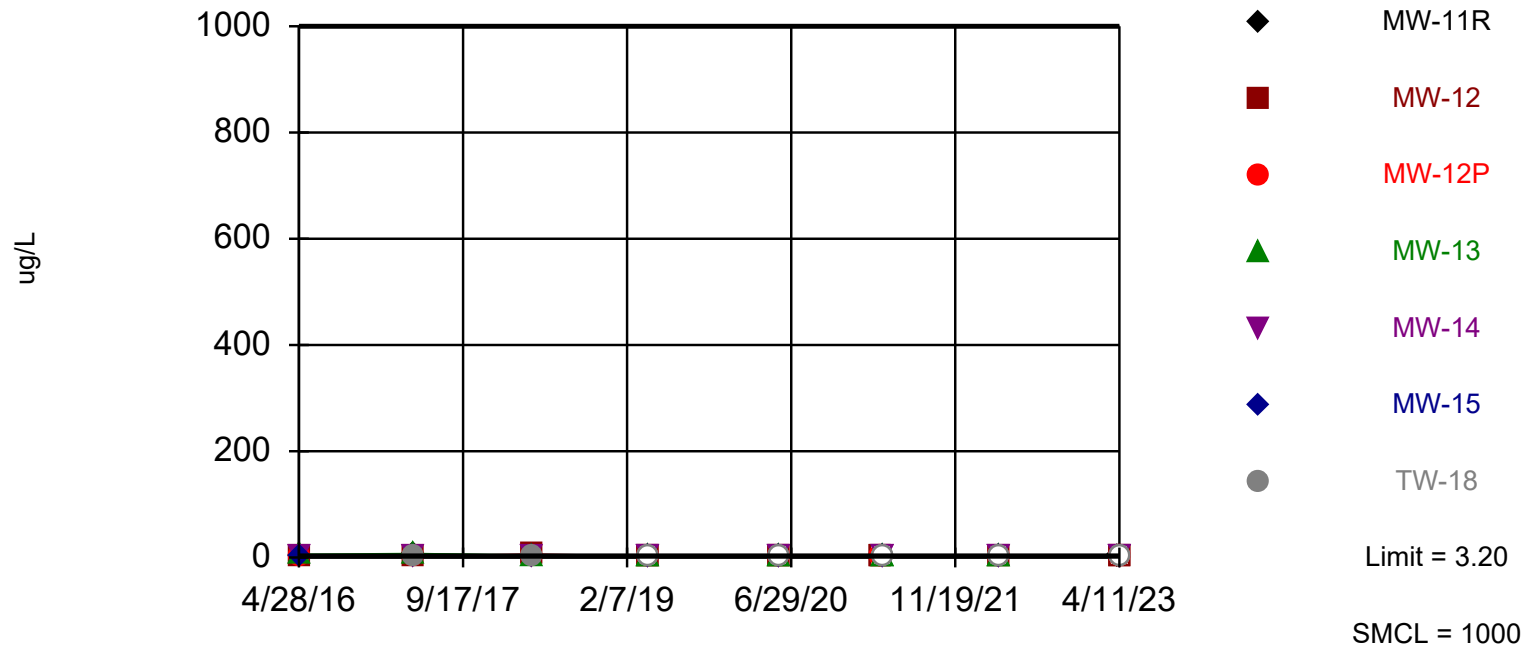
Constituent: Cobalt (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	8.2	1.6	1.9	0.7 (J)				
4/29/2016					<0.5	<0.5	<0.5	
4/19/2017					0.047 (J,B)			
4/20/2017	8	2.2	2.9	1.3		0.16 (J,B)	1.4	0.44 (J)
4/16/2018					<0.014			
4/17/2018	5.9	1.9	1.7	0.96 (J)		0.066 (J)	0.39 (J)	1.4
4/15/2019					<0.091		0.28 (J)	
4/16/2019	6.7	2.2	0.51	0.33 (J)		0.1 (J)		0.15 (J)
5/20/2020					0.17 (J)			
5/21/2020	7.2	2	0.44 (J)	0.17 (J)				
5/22/2020						<0.091	0.092 (J)	0.13 (J)
4/6/2021		1.9		<0.091				
4/7/2021	6.8		0.39 (J)		<0.091	<0.091	<0.091	<0.091
4/6/2022		1.4		<0.19 (U)	<0.19 (U)		<0.19 (U)	0.87
4/7/2022	5.7		0.85			<0.19 (U)		
4/10/2023	7.3							
4/11/2023		1.2		<0.17 (U)	<0.17 (U)		<0.17 (U)	2.9

Within Limit

Copper

Interwell Non-parametric



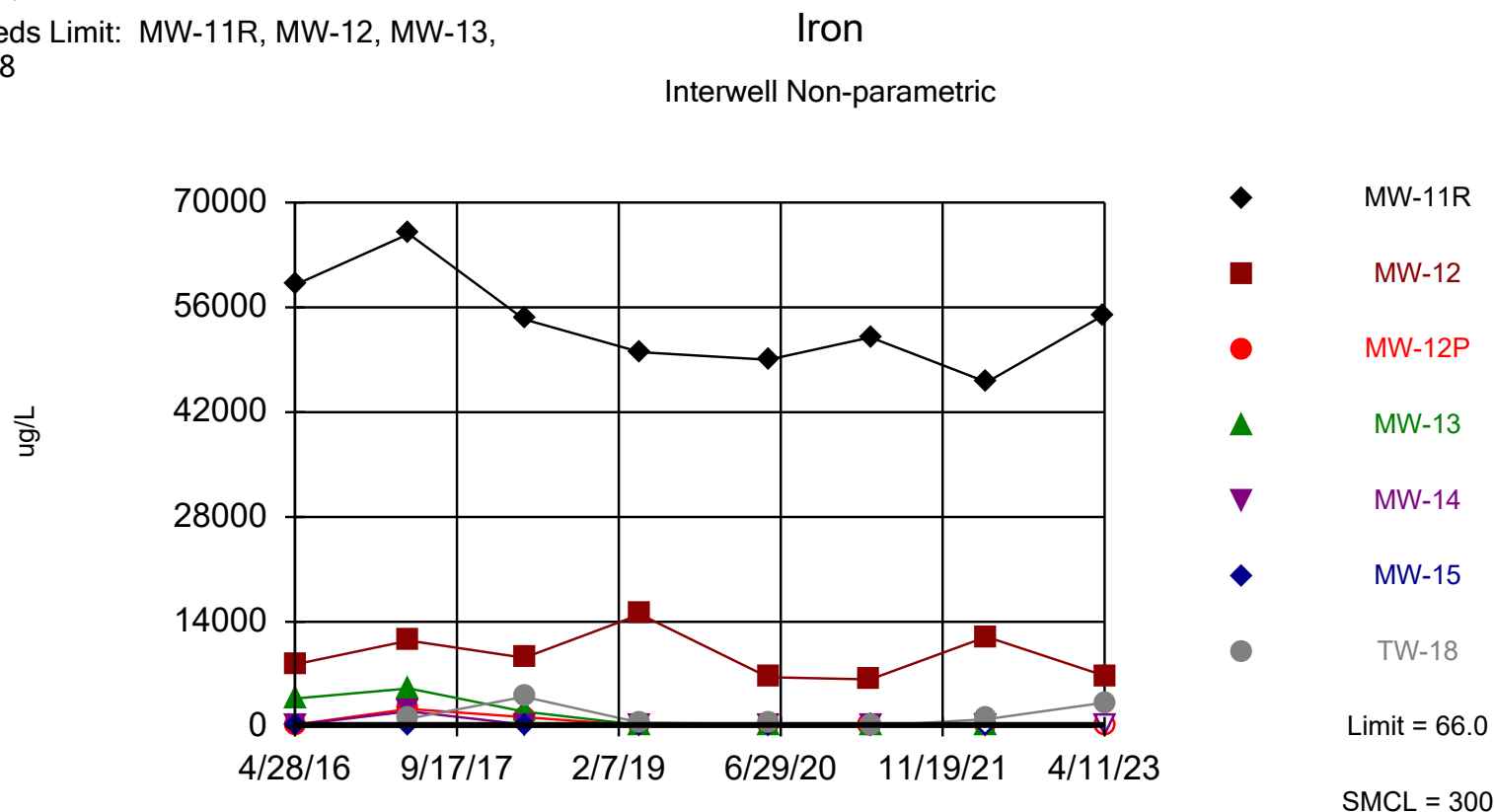
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

Constituent: Copper (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	0.94 (J,Y)	0.97 (J,Y)	5.1	0.58 (J,Y)				
4/29/2016					0.17 (J,Y)	0.96 (J,Y)	0.42 (J,Y)	
4/19/2017					0.21 (J,B)			
4/20/2017	5.8	1.7	6.6	2.3		0.87 (J,B)	2.3	0.84 (J,B)
4/16/2018					0.25 (J,B)			
4/17/2018	3.4	5.7	3.6	1.7		0.7 (J,B)	0.51 (J,B)	2.2
4/15/2019					<2		<2	
4/16/2019	<2	<2	<2	<2		<2		<2
5/20/2020					<3.2			
5/21/2020	<3.2	<3.2	<3.2	<3.2				
5/22/2020						<3.2	<3.2	<3.2
4/6/2021		<1.4		<1.4				
4/7/2021	<1.4		<1.4		<1.4	<1.4	<1.4	<1.4
4/6/2022		1.8 (J)		<1.8 (U)	<1.8 (U)		<1.8 (U)	<1.8 (U)
4/7/2022	<1.8 (U)		<1.8 (U)			<1.8 (U)		
4/10/2023	<1.8 (U)							
4/11/2023		<1.8 (U)		<1.8 (U)	<1.8 (U)		<1.8 (U)	<1.8 (U)

Exceeds Limit: MW-11R, MW-12, MW-13,
TW-18



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 87.5% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

Constituent: Iron (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data

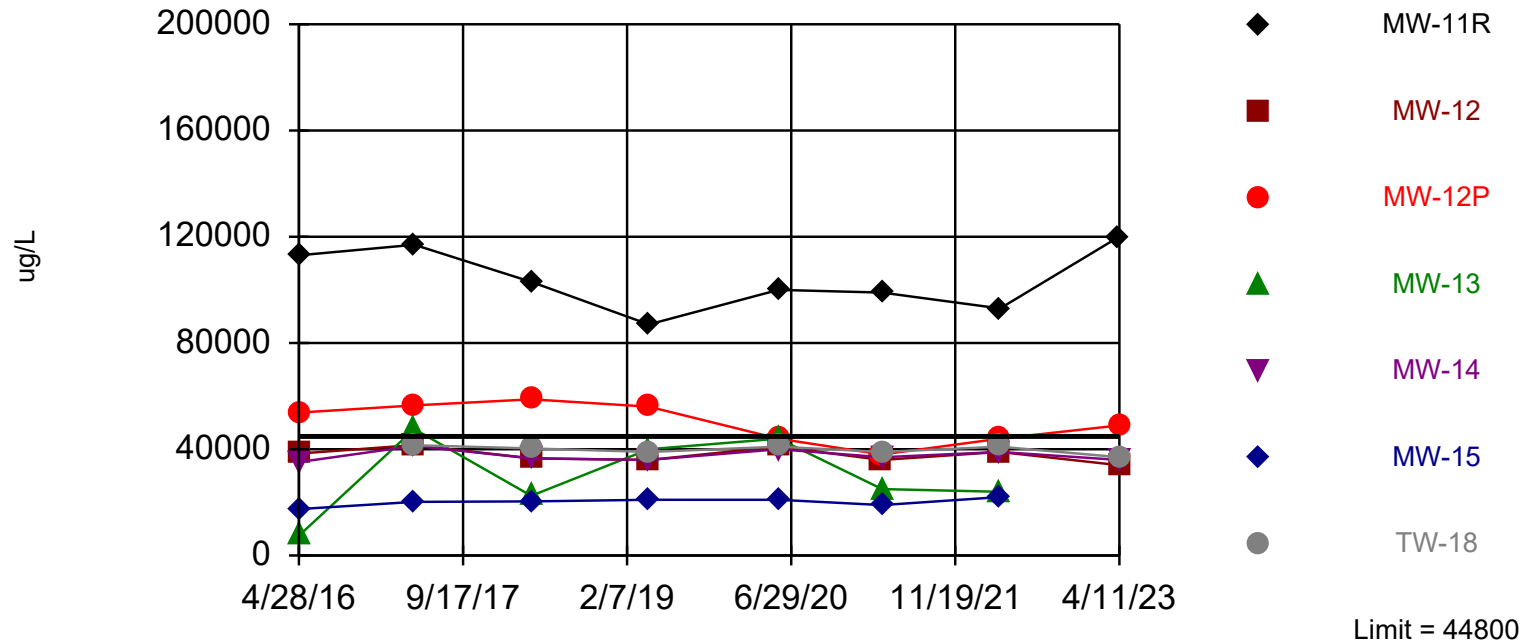
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	59000	8320	3760	250				
4/29/2016					<12.8	64.8	226	
4/19/2017					27.1 (J,B)			
4/20/2017	65800	11500	5100	2370		94.5 (B)	2040	1090
4/16/2018					<9.6			
4/17/2018	54400	9190	2010	1270		13.4 (J)	285	3980
4/15/2019					<66		110 (B)	
4/16/2019	50000 (B)	15000 (B)	220 (B)	130 (B)		<66		530 (B)
5/20/2020					<50			
5/21/2020	49000	6600	240	120				
5/22/2020						<50	57 (J)	340
4/6/2021		6300		<36				
4/7/2021	52000		180		<36	<36	39 (J)	79 (J)
4/6/2022		12000		39 (J)	<36 (U)		<36 (U)	1000
4/7/2022	46000		280			<36 (U)		
4/10/2023	55000							
4/11/2023		6800		<36 (U)	<36 (U)		<36 (U)	3200

Exceeds Limit: MW-11R, MW-12P

Magnesium

Interwell Parametric



Background Data Summary: Mean=38038, Std. Dev.=2255, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9413, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit Analysis Run 7/14/2023 9:25 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Prediction Limit

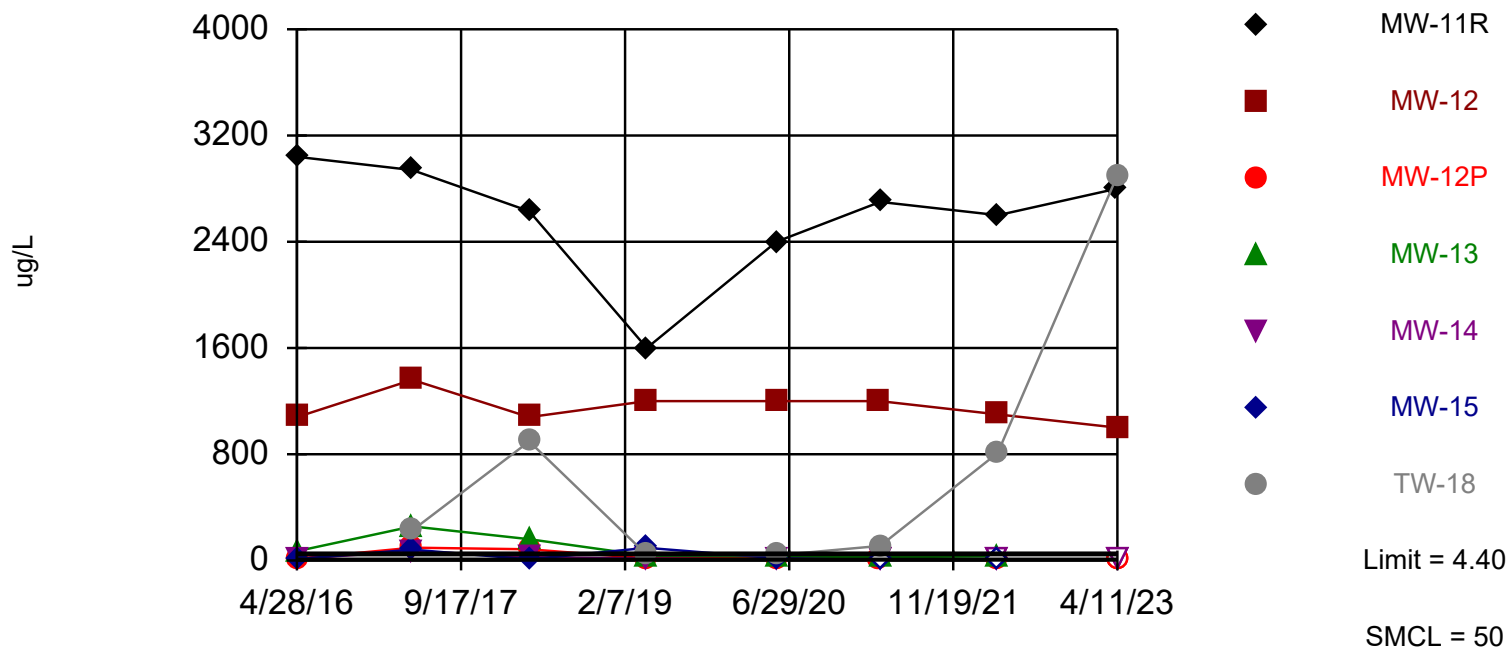
Constituent: Magnesium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	113000	38400	7490	53800				
4/29/2016					37600	17500	35200	
4/19/2017					37900			
4/20/2017	117000	41600	47600	56500		20200	41300	41500
4/16/2018					36800			
4/17/2018	103000 (M1)	36600	22500	58800		20400	36600	40300
4/15/2019					34000		36000	
4/16/2019	87000	36000	40000	56000		21000		39000
5/20/2020					41000			
5/21/2020	100000	41000	44000	44000				
5/22/2020						21000	40000	41000
4/6/2021		36000		38000				
4/7/2021	99000		25000		37000	19000	37000	39000
4/6/2022		39000		44000	40000		39000	41000
4/7/2022	93000		24000			22000		
4/10/2023	120000							
4/11/2023		34000		49000	40000		36000	37000

Exceeds Limit: MW-11R, MW-12, MW-13,
TW-18

Manganese

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

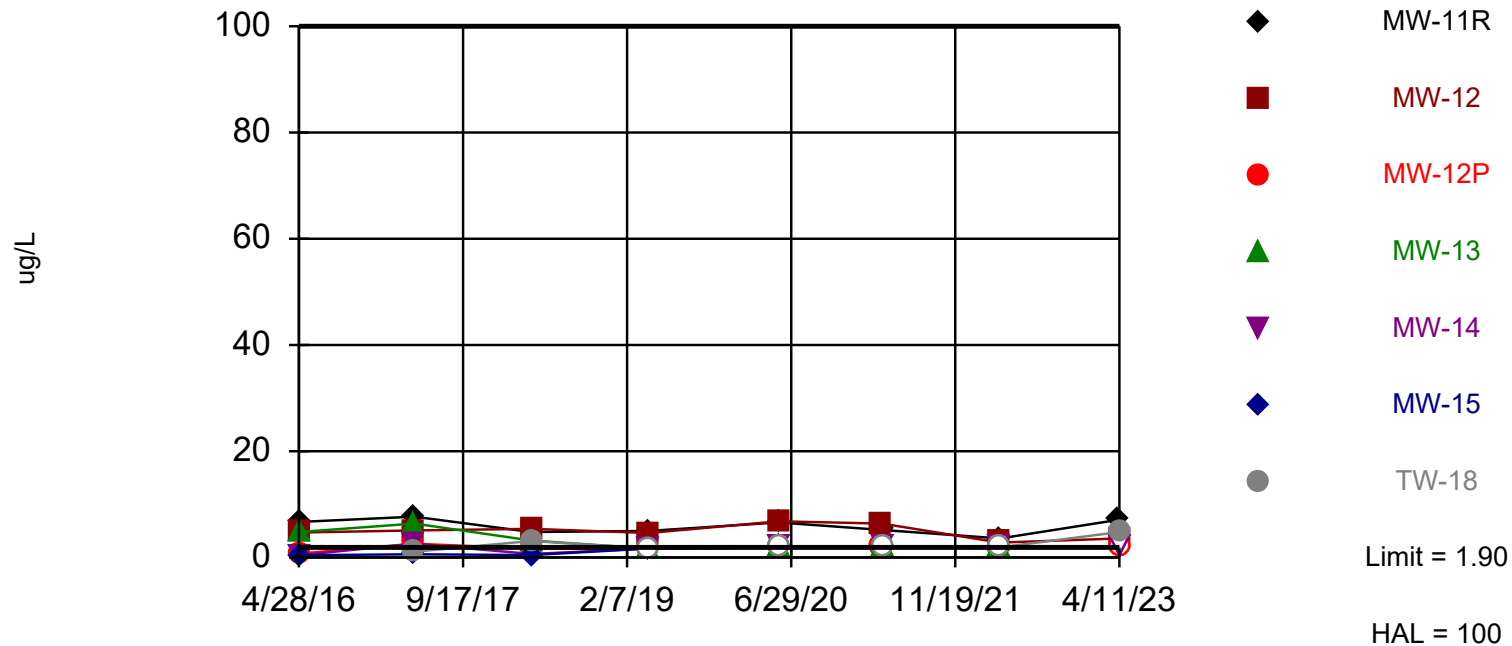
Constituent: Manganese (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	3040	1080	70.4	13.7				
4/29/2016					1.5 (Y)	11.1	12.6	
4/19/2017					1.8 (B)			
4/20/2017	2940	1360	257	96.9		82.1	71.7	227
4/16/2018					0.28 (J)			
4/17/2018	2630	1080	160	84.8		9.1	25.8	897
4/15/2019					<2.5		15	
4/16/2019	1600	1200	36	16		96		43
5/20/2020					<4			
5/21/2020	2400	1200	32	18				
5/22/2020						17	6 (J)	40
4/6/2021		1200		6.7 (J)				
4/7/2021	2700		26		<4.4	<4.4	<4.4	110
4/6/2022		1100		4.9 (J)	<3.6 (U)		<3.6 (U)	810
4/7/2022	2600		32			<3.6 (U)		
4/10/2023	2800							
4/11/2023		1000		<3.6 (U)	<3.6 (U)		<3.6 (U)	2900

Exceeds Limit: MW-11R

Nickel

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 75% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

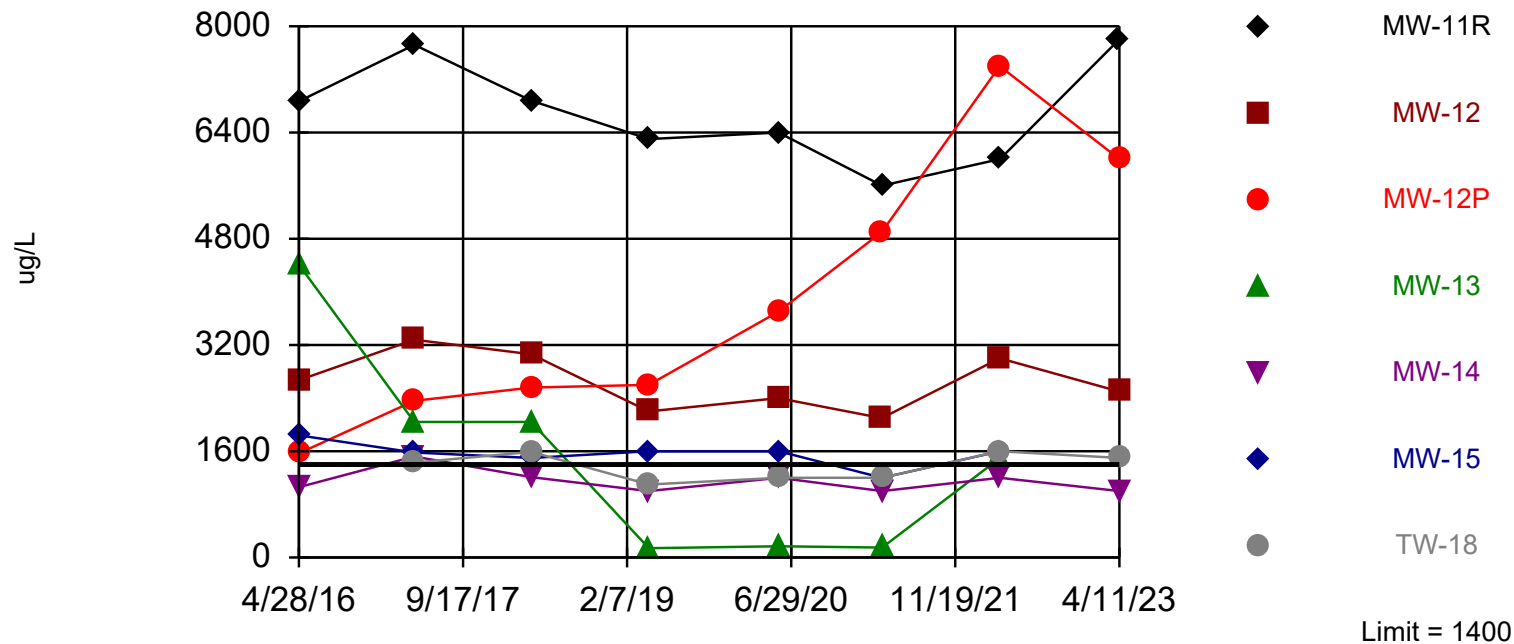
Constituent: Nickel (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	6.7	4.7	4.8	0.74 (J)				
4/29/2016					<0.27	0.44 (J)	0.42 (J)	
4/19/2017					0.5 (J,B)			
4/20/2017	7.7	5.1	6.4	2.6		0.62 (J,B)	2.6	1.1 (B)
4/16/2018					0.3 (J)			
4/17/2018	4.8	5.4	3.2	1.7		0.46 (J)	0.67 (J)	3.1
4/15/2019					<1.7		<1.7	
4/16/2019	5	4.6 (J)	<1.7	<1.7		<1.7		<1.7
5/20/2020					<1.9			
5/21/2020	6.6	6.8	<1.9	<1.9				
5/22/2020						<1.9	<1.9	<1.9
4/6/2021		6.4		<1.9				
4/7/2021	5.2		<1.9		<1.9	<1.9	<1.9	<1.9
4/6/2022		2.8 (J)		<1.9 (U)	<1.9 (U)		<1.9 (U)	<1.9 (U)
4/7/2022	3.6 (J)		<1.9 (U)			<1.9 (U)		
4/10/2023	7.1							
4/11/2023		3.6 (J)		<1.9 (U)	<1.9 (U)		<1.9 (U)	4.8 (J)

Exceeds Limit: MW-11R, MW-12, MW-12P,
MW-13, MW-15, TW-18

Potassium

Interwell Parametric



Background Data Summary: Mean=1084, Std. Dev.=105.6, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8551, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit

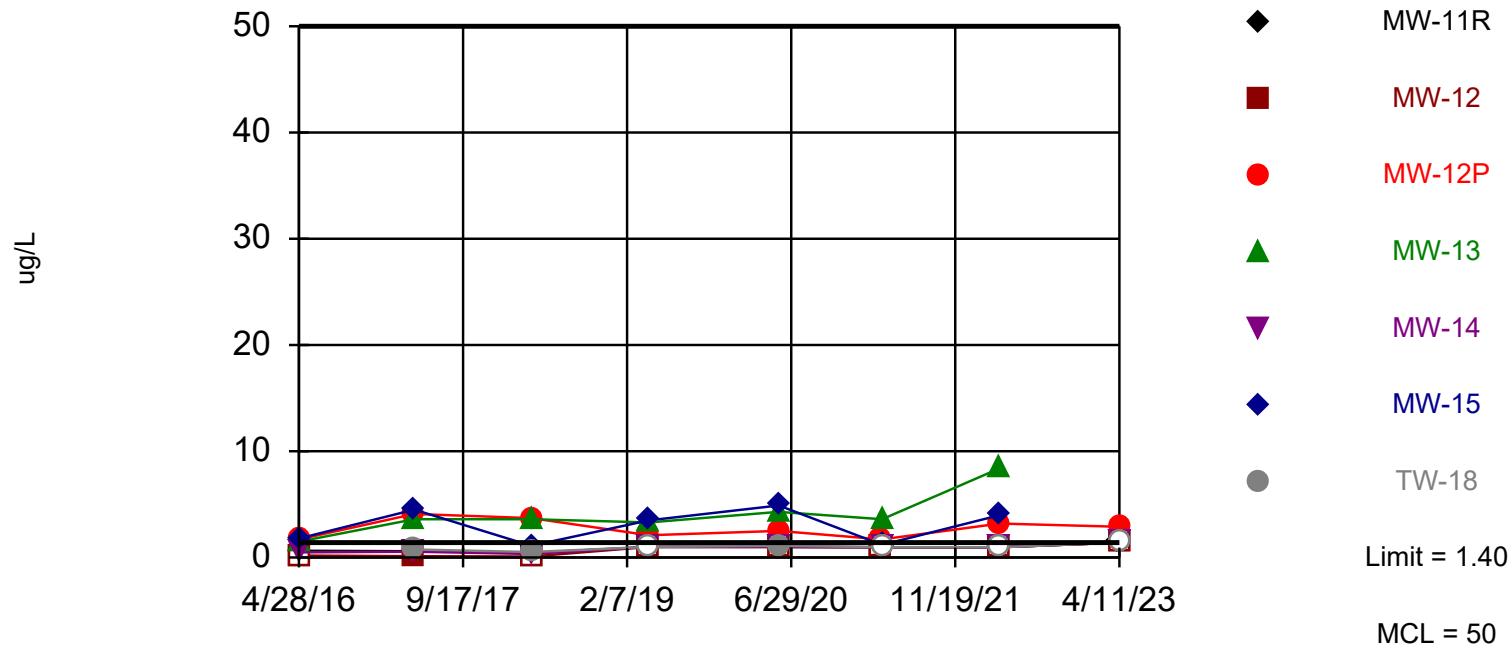
Constituent: Potassium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	6870	2670	4410	1570				
4/29/2016					1010	1840	1060	
4/19/2017					1020			
4/20/2017	7720	3280	2040	2360		1580	1520	1430
4/16/2018					1100			
4/17/2018	6880	3060	2040	2560		1500	1210	1590
4/15/2019					940		1000	
4/16/2019	6300	2200	140 (J)	2600		1600		1100
5/20/2020					1200			
5/21/2020	6400	2400	170 (J)	3700				
5/22/2020						1600	1200	1200
4/6/2021		2100		4900				
4/7/2021	5600		150 (J)		1000	1200	1000	1200
4/6/2022		3000		7400	1200		1200	1600
4/7/2022	6000		1500			1600		
4/10/2023	7800							
4/11/2023		2500		6000	1200		1000	1500

Exceeds Limit: MW-13

Selenium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Annual per-constituent alpha = 0.1216. Individual comparison alpha = 0.01836 (1 of 2). Comparing 7 points to limit.

Prediction Limit

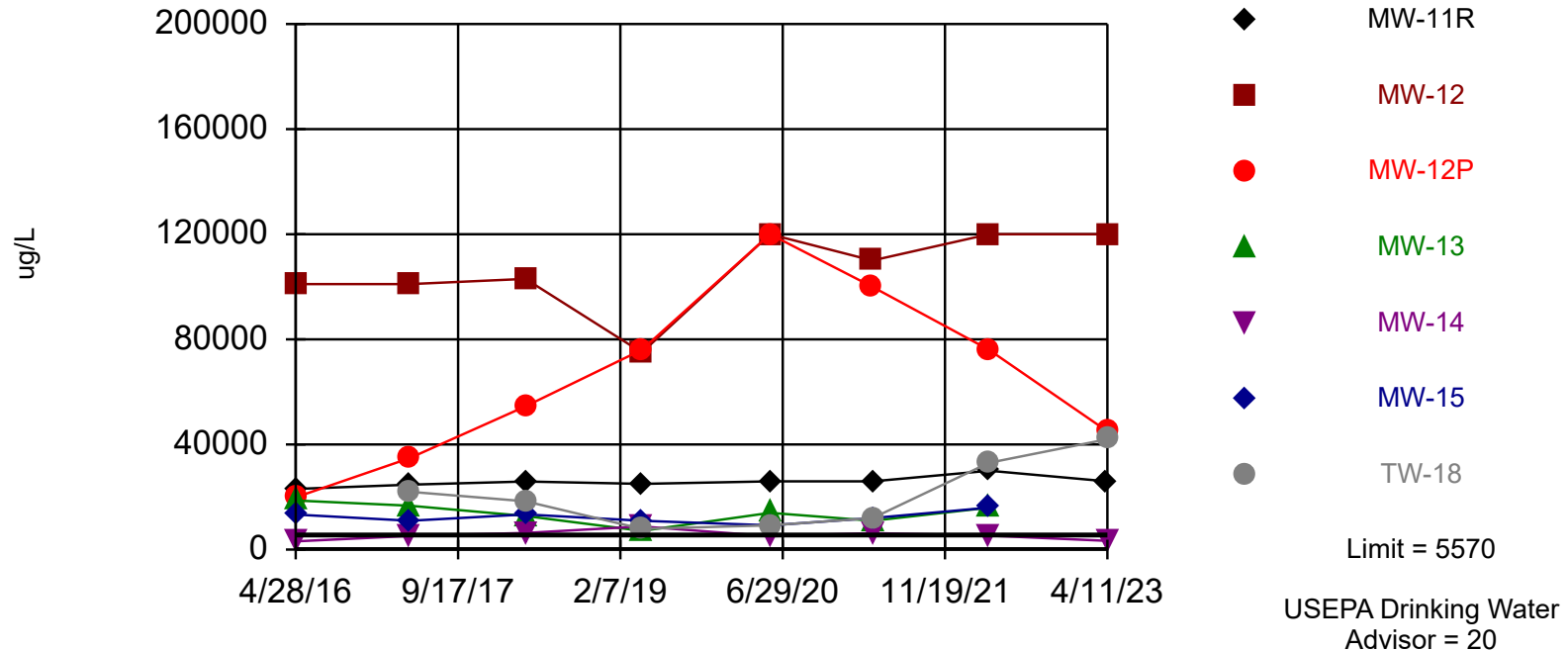
Constituent: Selenium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	0.63 (J)	<0.18	1.5	1.7				
4/29/2016					0.46 (J)	1.8	0.48 (J)	
4/19/2017					0.46 (J)			
4/20/2017	0.59 (J)	0.13 (J)	3.6	4.1		4.5	0.54 (J)	0.76 (J)
4/16/2018					0.24 (J)			
4/17/2018	0.44 (J)	<0.086	3.6	3.7		1.1	0.34 (J)	0.51 (J)
4/15/2019					<1		<1	
4/16/2019	<1	<1	3.3 (J)	2.1 (J)		3.5 (J)		<1
5/20/2020					<1			
5/21/2020	<1	<1	4.3 (J)	2.5 (J)				
5/22/2020						4.9 (J)	<1	1.1 (J)
4/6/2021		<0.96		1.7 (J)				
4/7/2021	<0.96		3.6 (J,B)		<0.96	1.2 (J,B)	<0.96	<0.96
4/6/2022		<0.96 (U)		3.2 (J)	<0.96 (U)		<0.96 (U)	<0.96 (U)
4/7/2022	<0.96 (U)		8.4			4 (J)		
4/10/2023	1.4 (J)							
4/11/2023		<1.4 (U)		2.9 (J)	<1.4 (U)		<1.4 (U)	<1.4 (U)

Exceeds Limit: MW-11R, MW-12, MW-12P,
MW-13, MW-15, TW-18

Sodium

Interwell Parametric



Background Data Summary: Mean=4704, Std. Dev.=287.7, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8746, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit Analysis Run 7/14/2023 9:25 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Prediction Limit

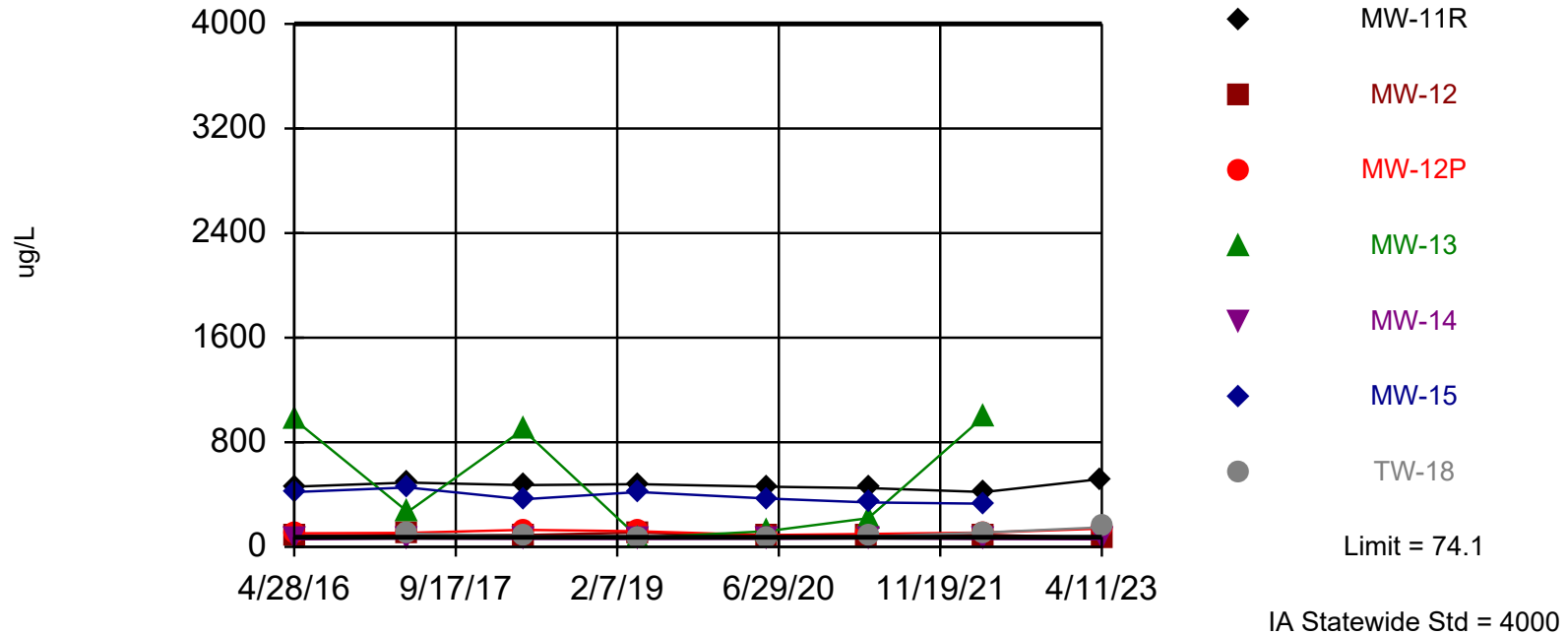
Constituent: Sodium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	23100	101000	18700	19900				
4/29/2016					4610	13300	3140	
4/19/2017					4870			
4/20/2017	24700	101000	16700	34800		11000	5220	22000
4/16/2018					4650			
4/17/2018	25900	103000	12800	54500		13400	6340	18400
4/15/2019					4500		8800	
4/16/2019	25000	75000	7100	76000		11000		7900
5/20/2020					5100			
5/21/2020	26000	120000	14000	120000				
5/22/2020						9200	5100	9200
4/6/2021		110000		100000				
4/7/2021	26000		11000		4400	12000	6300	12000
4/6/2022		120000		76000	5100		5300	33000
4/7/2022	30000		16000			16000		
4/10/2023	26000							
4/11/2023		120000		45000	4400		3300	42000

Exceeds Limit: MW-11R, MW-12P, MW-13,
MW-15, TW-18

Strontium

Interwell Parametric



Background Data Summary: Mean=62.59, Std. Dev.=3.851, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9087, critical = 0.749. Kappa = 2.995 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit Analysis Run 7/14/2023 9:25 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Prediction Limit

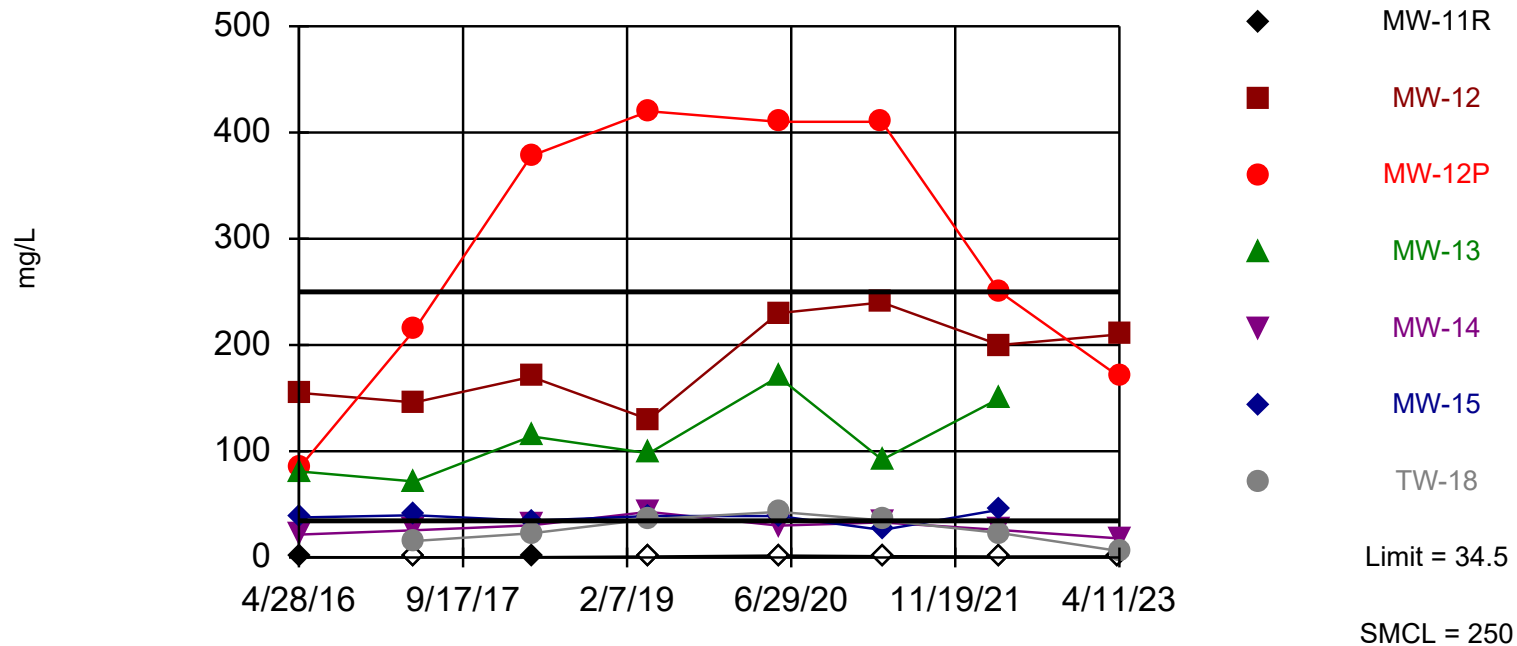
Constituent: Strontium (ug/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-11R	MW-12	MW-13	MW-12P	MW-6 (bg)	MW-15	MW-14	TW-18
4/28/2016	460 (Y)	83.9	975 (Y)	104 (Y)				
4/29/2016					60.7 (Y)	419 (Y)	58.3 (Y)	
4/19/2017					61.2 (N2)			
4/20/2017	492 (N2)	94.2 (N2)	268 (N2)	107 (N2)		454 (N2)	63.8 (N2)	101 (N2)
4/16/2018					63.8 (N2)			
4/17/2018	473 (N2)	90.6 (N2)	897 (N2)	130 (N2)		364 (N2)	61.6 (N2)	85.6 (N2)
4/15/2019					58		60	
4/16/2019	480	110	70	120		420		67
5/20/2020					70			
5/21/2020	460	81	120	91				
5/22/2020						370	62	63
4/6/2021		79		99				
4/7/2021	450		220		66	340	65	80
4/6/2022		93		110	61		61	110
4/7/2022	420		1000			330		
4/10/2023	520							
4/11/2023		70		140	60		58	150

Exceeds Limit: MW-12, MW-12P, MW-13,
MW-15

Sulfate

Interwell Parametric



Background Data Summary: Mean=26.01, Std. Dev.=3.983, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9063, critical = 0.888. Kappa = 2.141 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.000885. Comparing 7 points to limit.

Prediction Limit

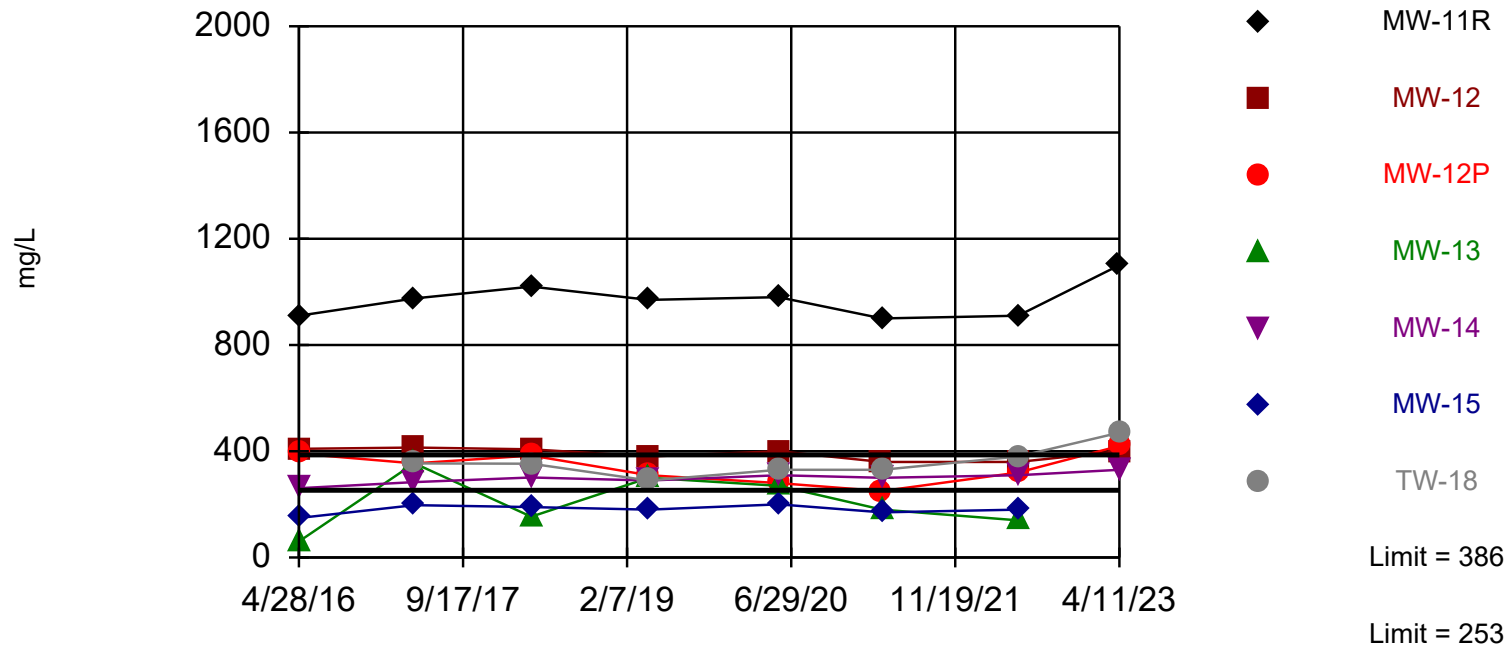
Constituent: Sulfate (mg/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data
 Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)	MW-13	MW-11R	MW-12P	MW-12	MW-15	MW-14	TW-18
5/11/2001	29							
3/8/2002	33							
2/19/2004	25							
5/26/2004	30							
8/23/2004	31							
11/18/2004	27							
5/5/2005	38							
5/19/2006	28 (J)							
5/30/2007	190 (X)							
4/16/2008	20							
4/3/2009	24							
4/21/2010	24.8							
5/4/2011	24.4							
4/25/2012	21.1							
4/2/2013	23.4							
7/2/2013	24.8							
4/29/2014	24.2							
4/20/2015	23.8							
4/28/2016		81.1	0.38 (J,Y)	84.1	155			
4/29/2016	24					37.7	21.5	
4/19/2017	25.4							
4/20/2017		71.5	<0.5	214	146	39.8	25.7	15.5
4/16/2018	26.4							
4/17/2018		114	0.39 (J)	378	170	34.6	30.3	22.7
4/15/2019	27						43	
4/16/2019		98	<1.8	420	130	39		36
5/20/2020	27							
5/21/2020		170	<3.6	410	230			
5/22/2020						39	30	43
4/6/2021				410	240			
4/7/2021	25	92	<2.5			26	33	35
4/6/2022	24			250	200		26	23
4/7/2022		150	<2 (U)			45		
4/10/2023			<2.1 (U)					
4/11/2023	20			170	210		18	6.1

Exceeds Limits: MW-11R, MW-12, MW-12P, MW-13, MW-15, TW-18

Total Alkalinity

Interwell Parametric



Background Data Summary: Mean=319.3, Std. Dev.=26.46, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8863, critical = 0.805. Kappa = 2.521 (c=17, w=7, 1 of 2, event alpha = 0.1). Report alpha = 0.006179. Individual comparison alpha = 0.0004425. Comparing 7 points to limit.

Prediction Limit Analysis Run 7/14/2023 9:25 AM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Prediction Limit

Constituent: Total Alkalinity (mg/L) Analysis Run 7/14/2023 9:27 AM View: Lansing State Data

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)	MW-11R	MW-12	MW-13	MW-12P	MW-15	MW-14	TW-18
4/2/2013	314							
7/2/2013	298							
4/29/2014	327							
4/20/2015	311							
4/28/2016		910	409	60.2	391			
4/29/2016	377					149	261	
4/19/2017	293							
4/20/2017		975	414	355	354	197	284	354
4/16/2018	311							
4/17/2018		1020	407	154	384	190	301	353
4/15/2019	290						290	
4/16/2019		970	380	300	310	180		290
5/20/2020	320							
5/21/2020		980	400	270	280			
5/22/2020						200	310	330
4/6/2021			360		250			
4/7/2021	300	900		180		170	300	330
4/6/2022	330							
6/2/2022		910	360	140	320	180	310	380
4/10/2023		1100						
4/11/2023	360		400		420		330	470



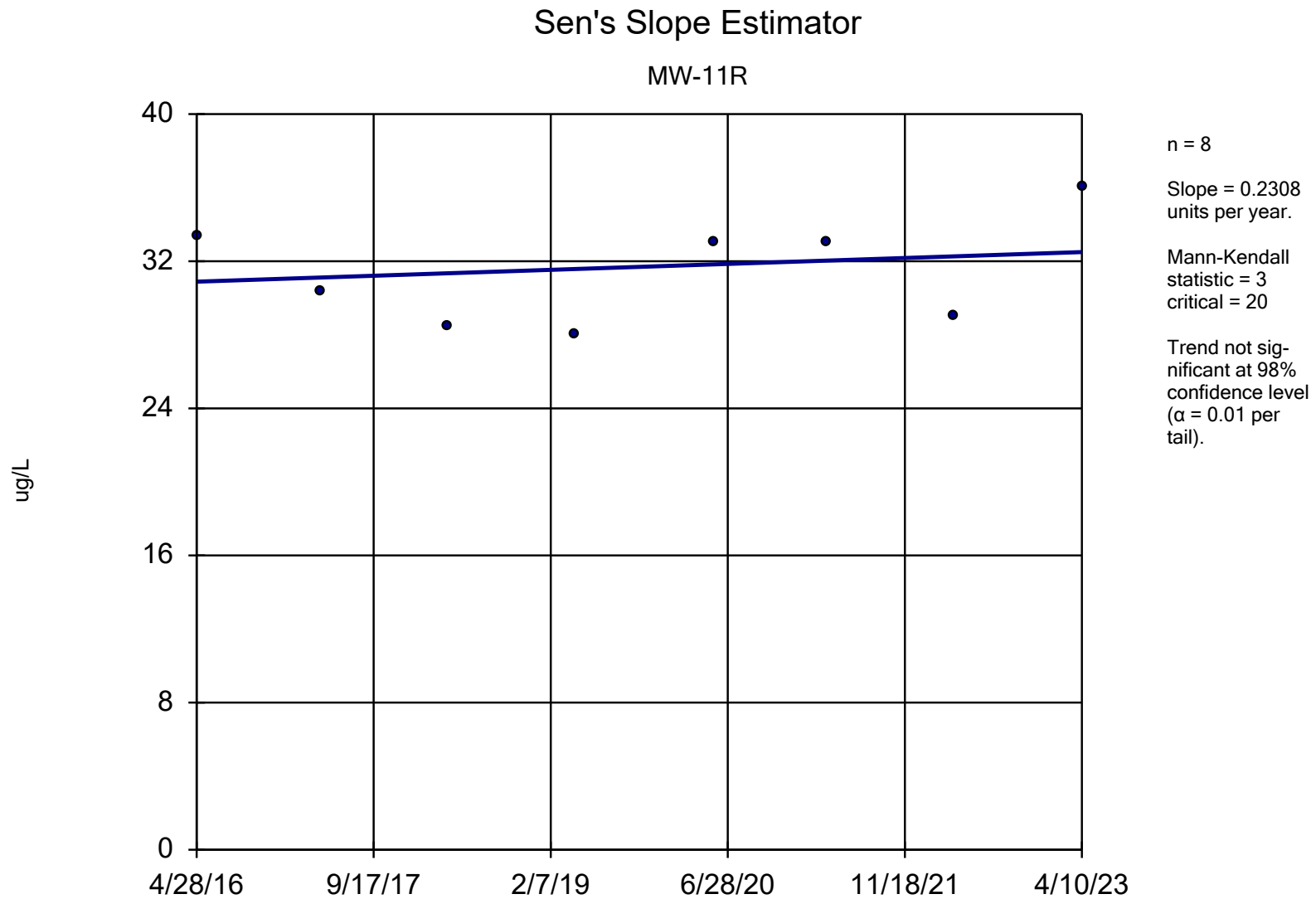
Appendix E

Trend Analysis

Trend Test

Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions Printed 11/27/2023, 4:57 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic (ug/L)	MW-11R	0.2308	3	20	No	8	0	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-12	0.3238	9	20	No	8	0	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-12P	0	2	20	No	8	62.5	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-13	-0.151	-16	-17	No	7	57.14	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-14	0.02644	8	20	No	8	62.5	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-15	0.07284	10	17	No	7	57.14	n/a	n/a	0.02	NP
Arsenic (ug/L)	MW-6 (bg)	0.05581	9	20	No	8	62.5	n/a	n/a	0.02	NP
Arsenic (ug/L)	TW-18	-0.06937	-6	-17	No	7	57.14	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-11R	-0.2252	-8	-20	No	8	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-12	-0.12	-12	-20	No	8	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-12P	-0.124	-17	-20	No	8	37.5	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-13	-0.3053	-13	-17	No	7	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-14	-0.0651	-18	-20	No	8	50	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-15	-0.00...	-4	-17	No	7	57.14	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-6 (bg)	0.01544	6	20	No	8	75	n/a	n/a	0.02	NP
Cobalt (ug/L)	TW-18	0.08662	1	17	No	7	14.29	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-11R	-47.51	-6	-20	No	8	0	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-12	-13.77	-6	-20	No	8	0	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-12P	-5.156	-18	-20	No	8	12.5	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-13	-9.445	-14	-17	No	7	0	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-14	-3.342	-21	-20	Yes	8	37.5	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-15	-1.384	-9	-17	No	7	28.57	n/a	n/a	0.02	NP
Manganese (ug/L)	MW-6 (bg)	0.358	15	20	No	8	62.5	n/a	n/a	0.02	NP
Manganese (ug/L)	TW-18	117.4	5	17	No	7	0	n/a	n/a	0.02	NP



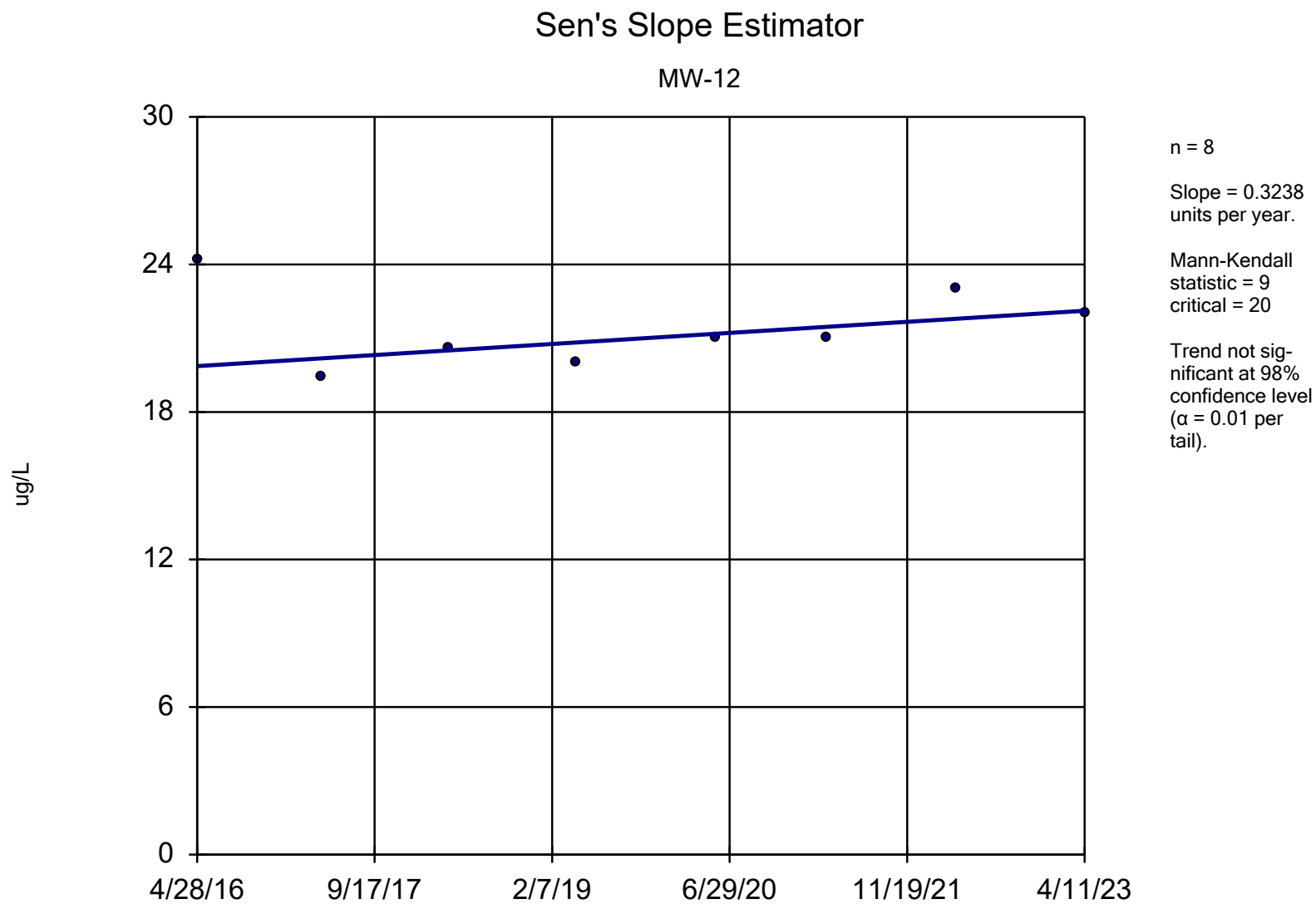
Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-11R

4/28/2016	33.4
4/20/2017	30.4
4/17/2018	28.5
4/16/2019	28
5/21/2020	33
4/7/2021	33
4/7/2022	29
4/10/2023	36



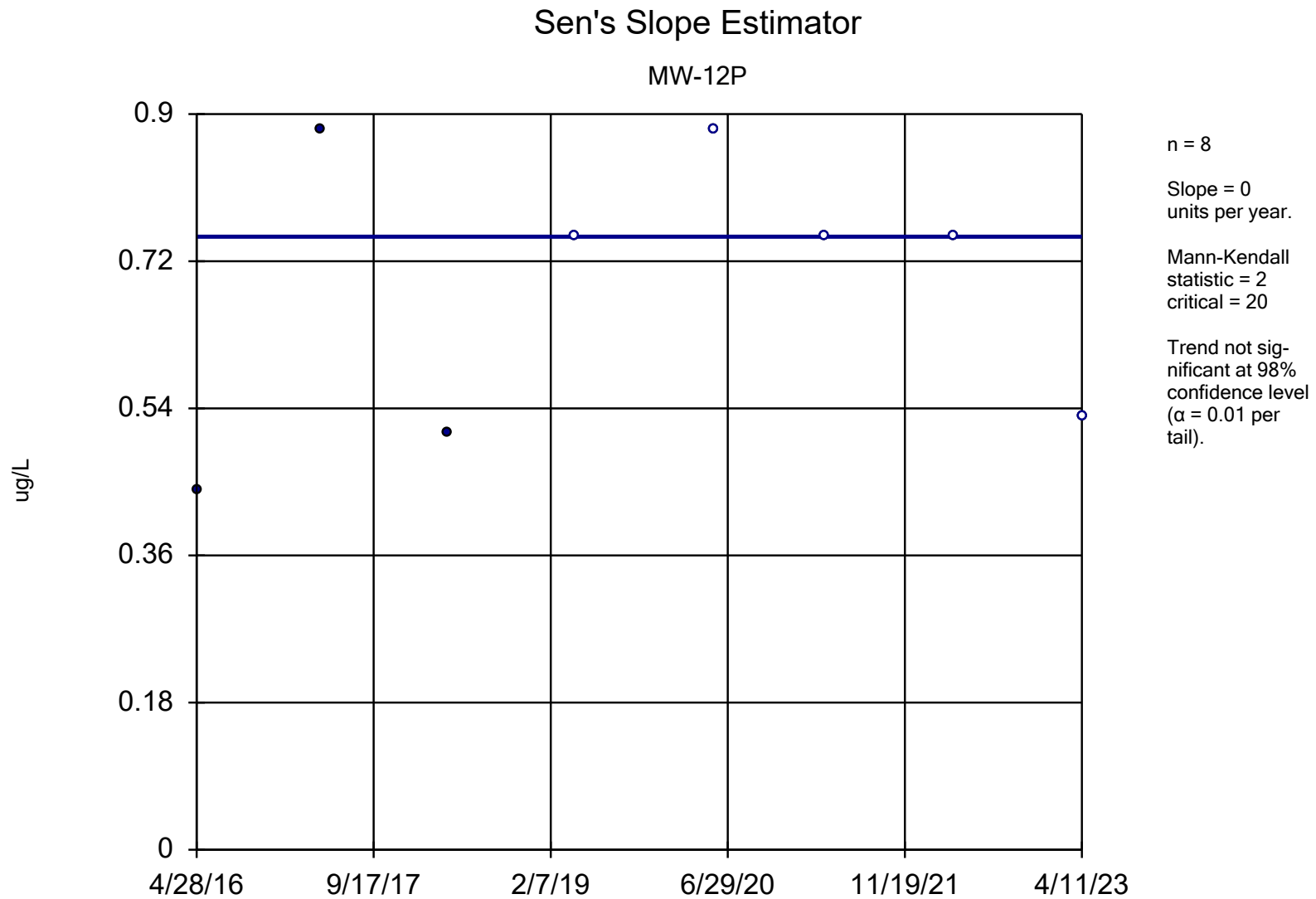
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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-12

4/28/2016	24.2
4/20/2017	19.4
4/17/2018	20.6
4/16/2019	20
5/21/2020	21
4/6/2021	21
4/6/2022	23
4/11/2023	22



Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

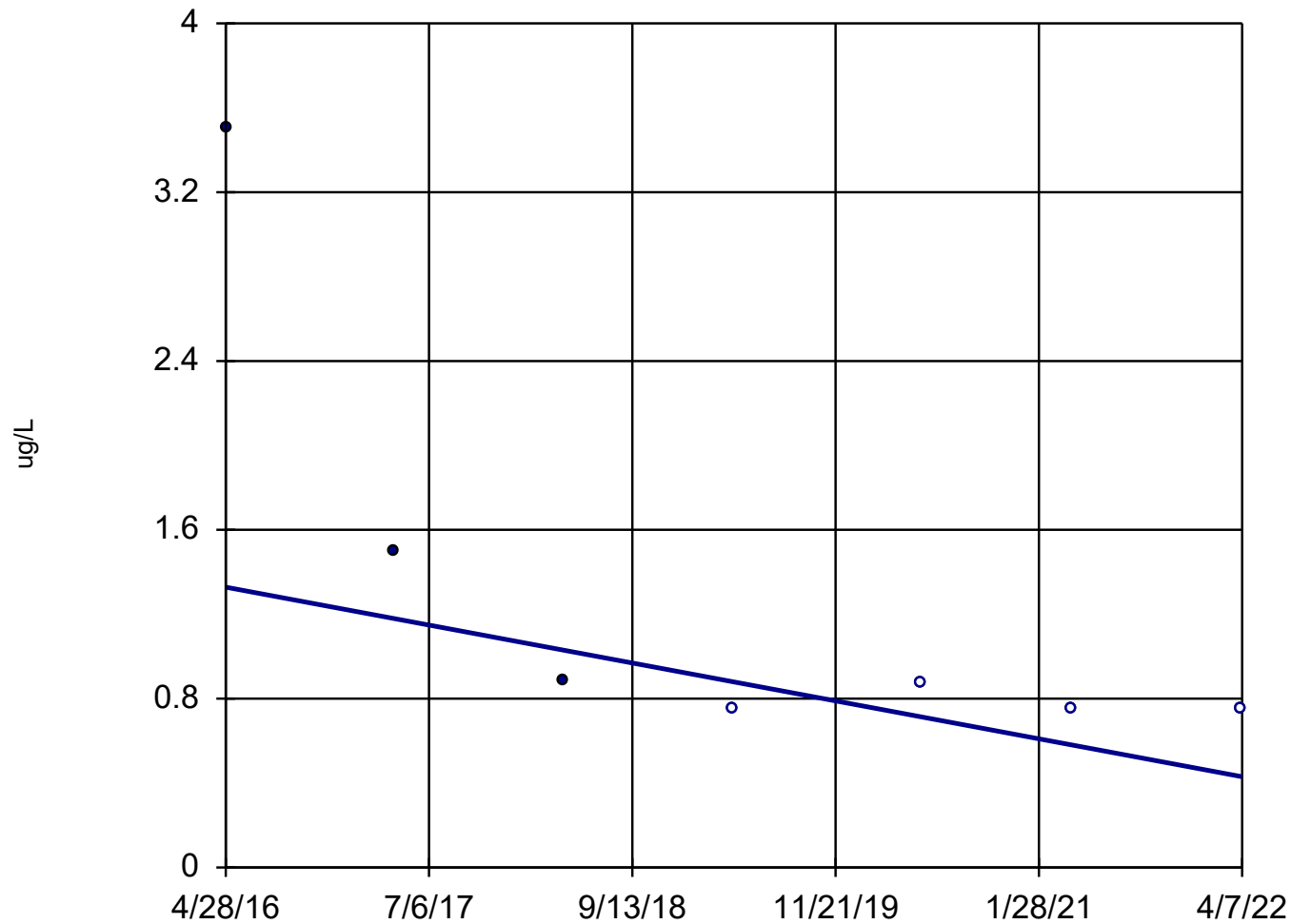
Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-12P
4/28/2016	0.44 (J)
4/20/2017	0.88 (J)
4/17/2018	0.51 (J)
4/16/2019	<0.75
5/21/2020	<0.88
4/6/2021	<0.75
4/6/2022	<0.75 (U)
4/11/2023	<0.53 (U)

Sen's Slope Estimator

MW-13



n = 7

Slope = -0.151
units per year.

Mann-Kendall
statistic = -16
critical = -17

Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

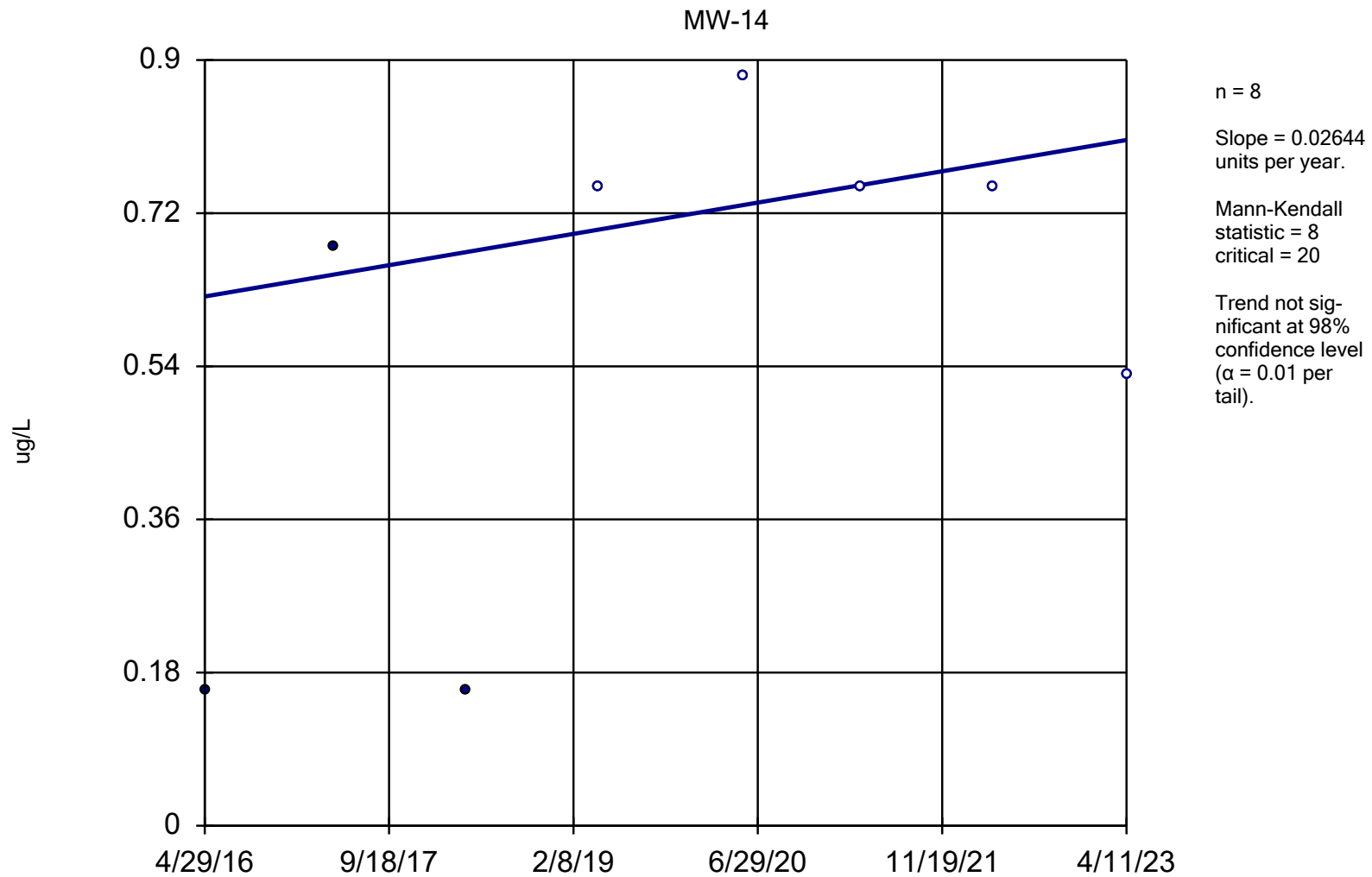
Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-13
4/28/2016	3.5
4/20/2017	1.5
4/17/2018	0.89 (J)
4/16/2019	<0.75
5/21/2020	<0.88
4/7/2021	<0.75
4/7/2022	<0.75 (U)

Sen's Slope Estimator



Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

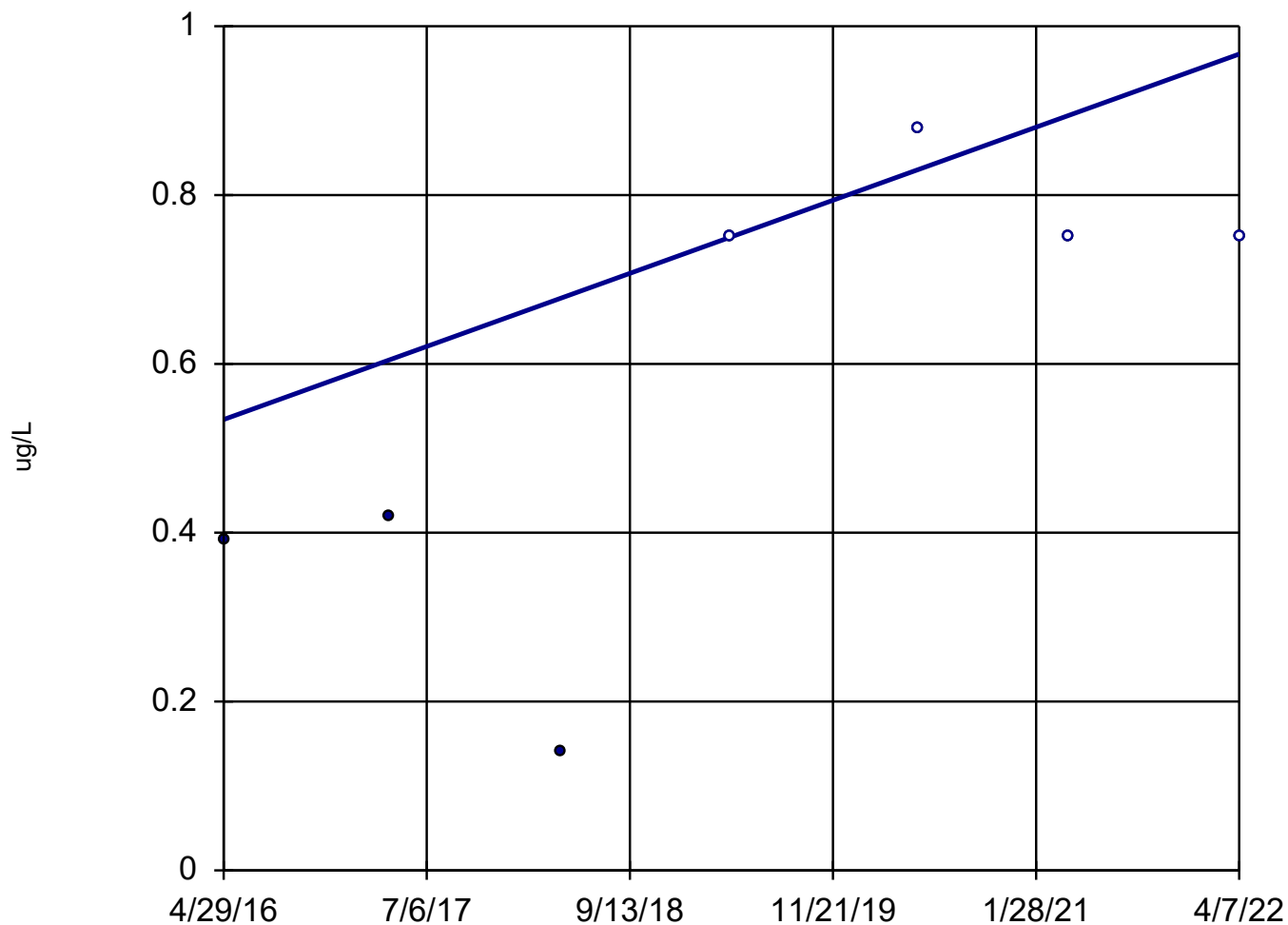
Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-14
4/29/2016	0.16 (J)
4/20/2017	0.68 (J)
4/17/2018	0.16 (J)
4/15/2019	<0.75
5/22/2020	<0.88
4/7/2021	<0.75
4/6/2022	<0.75 (U)
4/11/2023	<0.53 (U)

Sen's Slope Estimator

MW-15



n = 7

Slope = 0.07284
units per year.

Mann-Kendall
statistic = 10
critical = 17

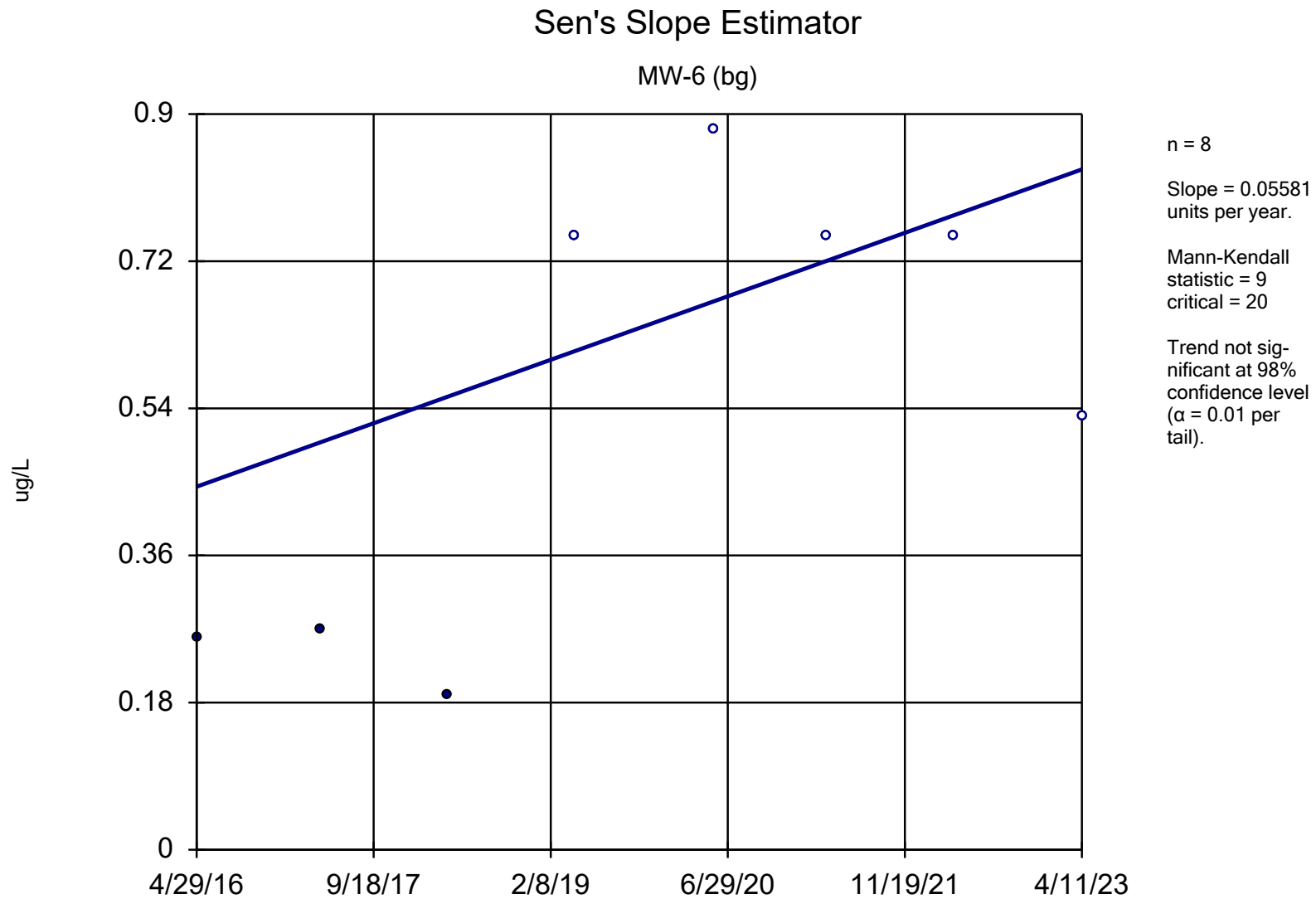
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-15
4/29/2016	0.39 (J)
4/20/2017	0.42 (J)
4/17/2018	0.14 (J)
4/16/2019	<0.75
5/22/2020	<0.88
4/7/2021	<0.75
4/7/2022	<0.75 (U)



Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

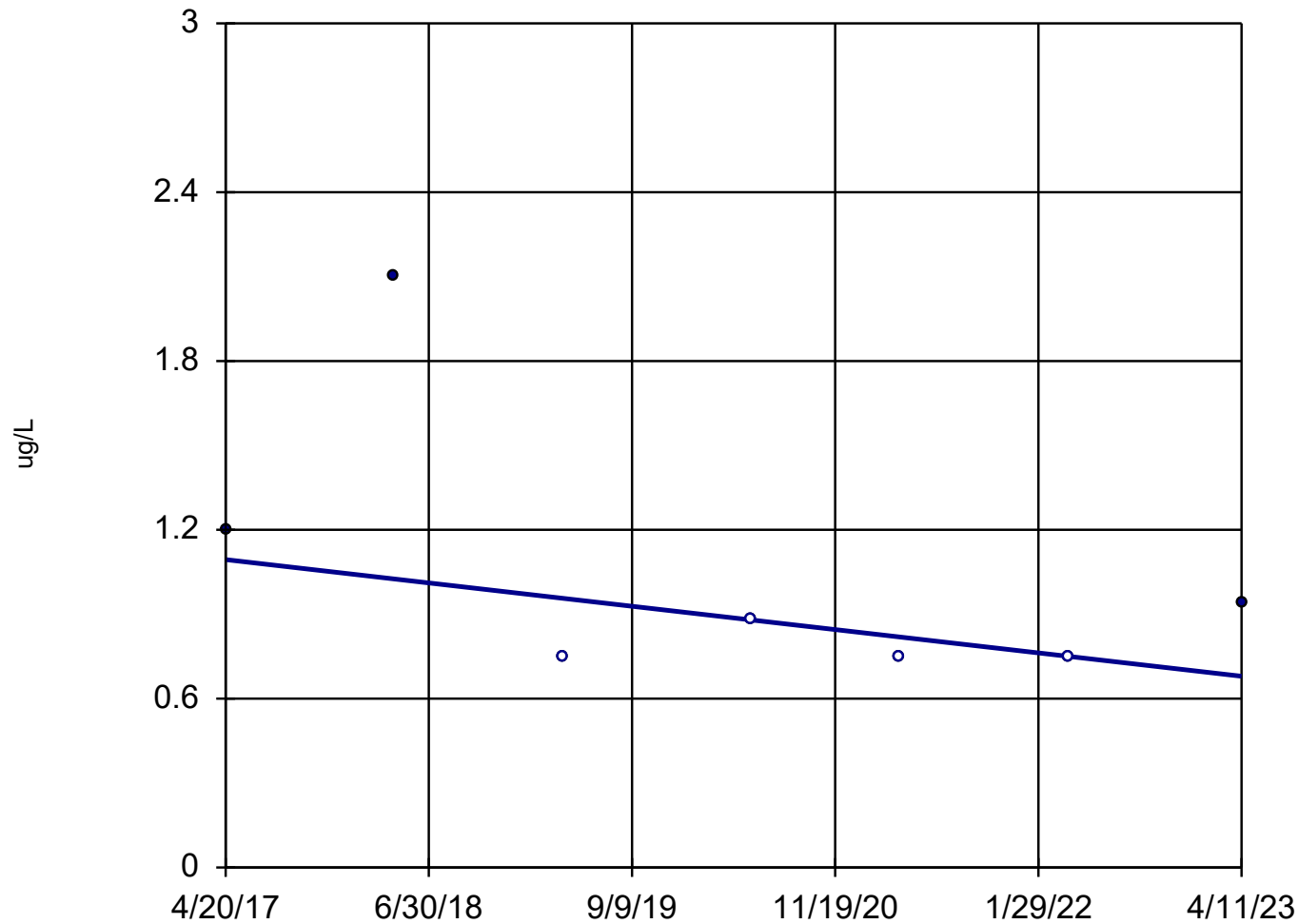
Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	0.26 (J)
4/19/2017	0.27 (J)
4/16/2018	0.19 (J)
4/15/2019	<0.75
5/20/2020	<0.88
4/7/2021	<0.75
4/6/2022	<0.75 (U)
4/11/2023	<0.53 (U)

Sen's Slope Estimator

TW-18



n = 7

Slope = -0.06937
units per year.

Mann-Kendall
statistic = -6
critical = -17

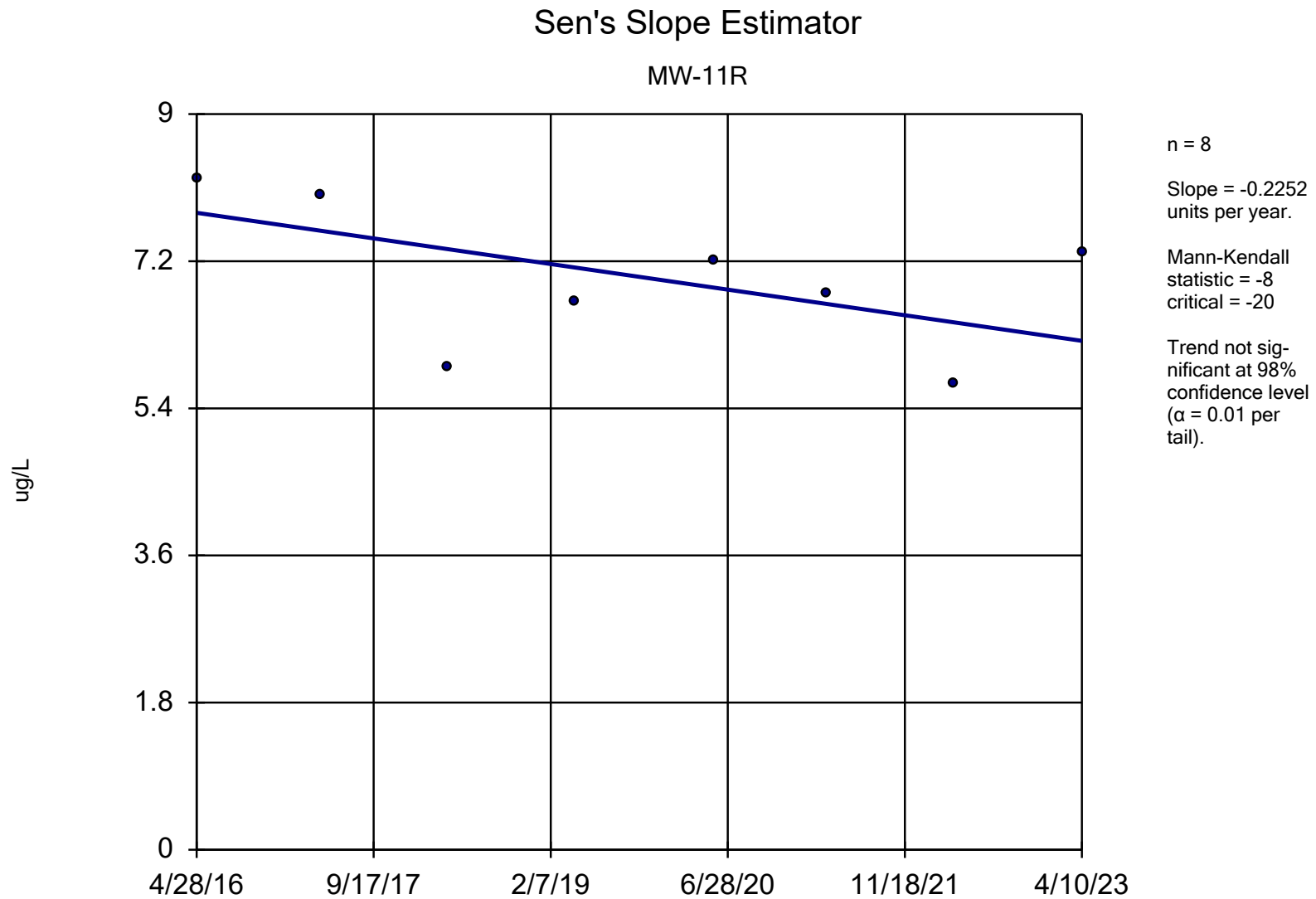
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	TW-18
4/20/2017	1.2
4/17/2018	2.1
4/16/2019	<0.75
5/22/2020	<0.88
4/7/2021	<0.75
4/6/2022	<0.75 (U)
4/11/2023	0.94 (J)



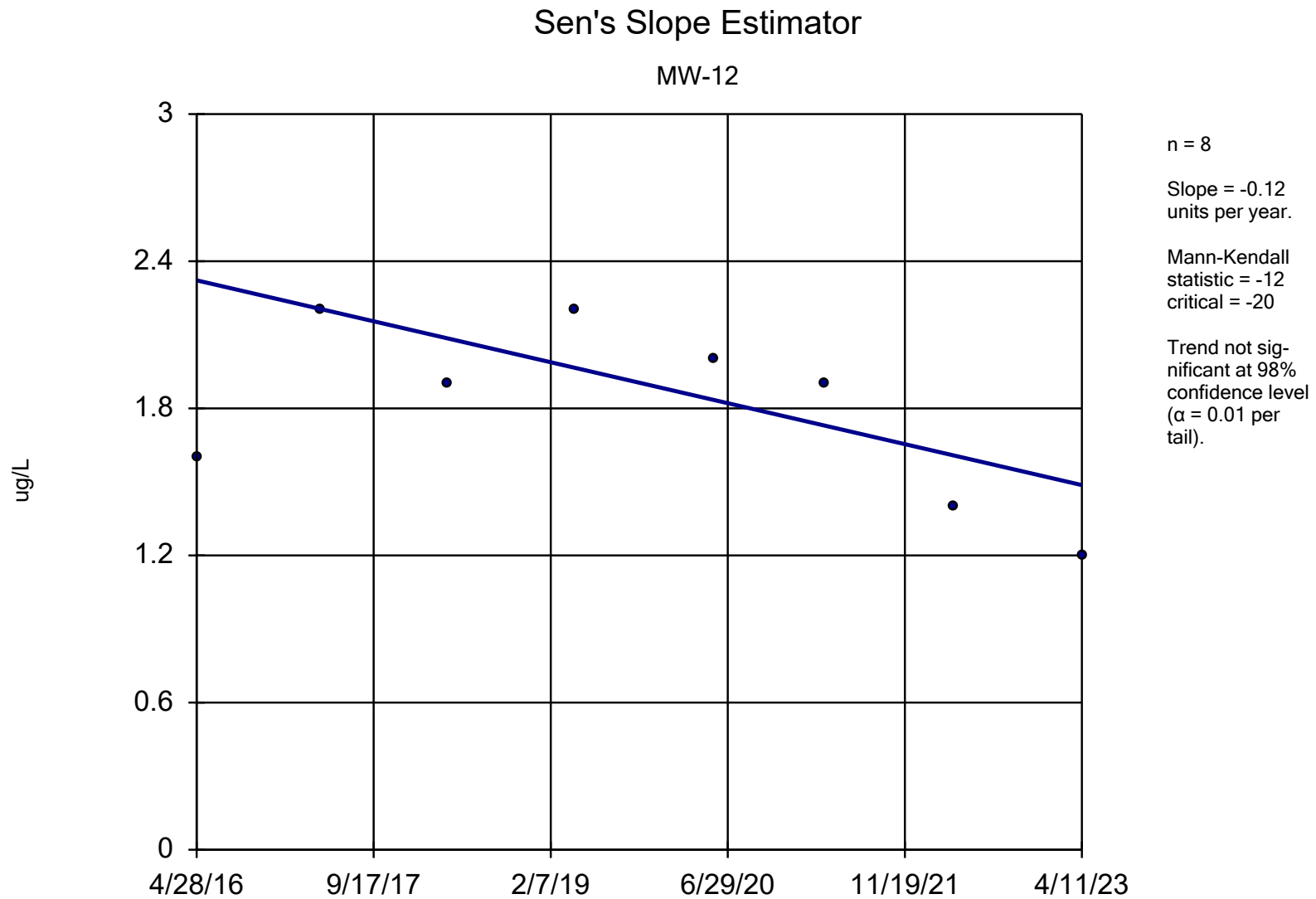
Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-11R

4/28/2016	8.2
4/20/2017	8
4/17/2018	5.9
4/16/2019	6.7
5/21/2020	7.2
4/7/2021	6.8
4/7/2022	5.7
4/10/2023	7.3



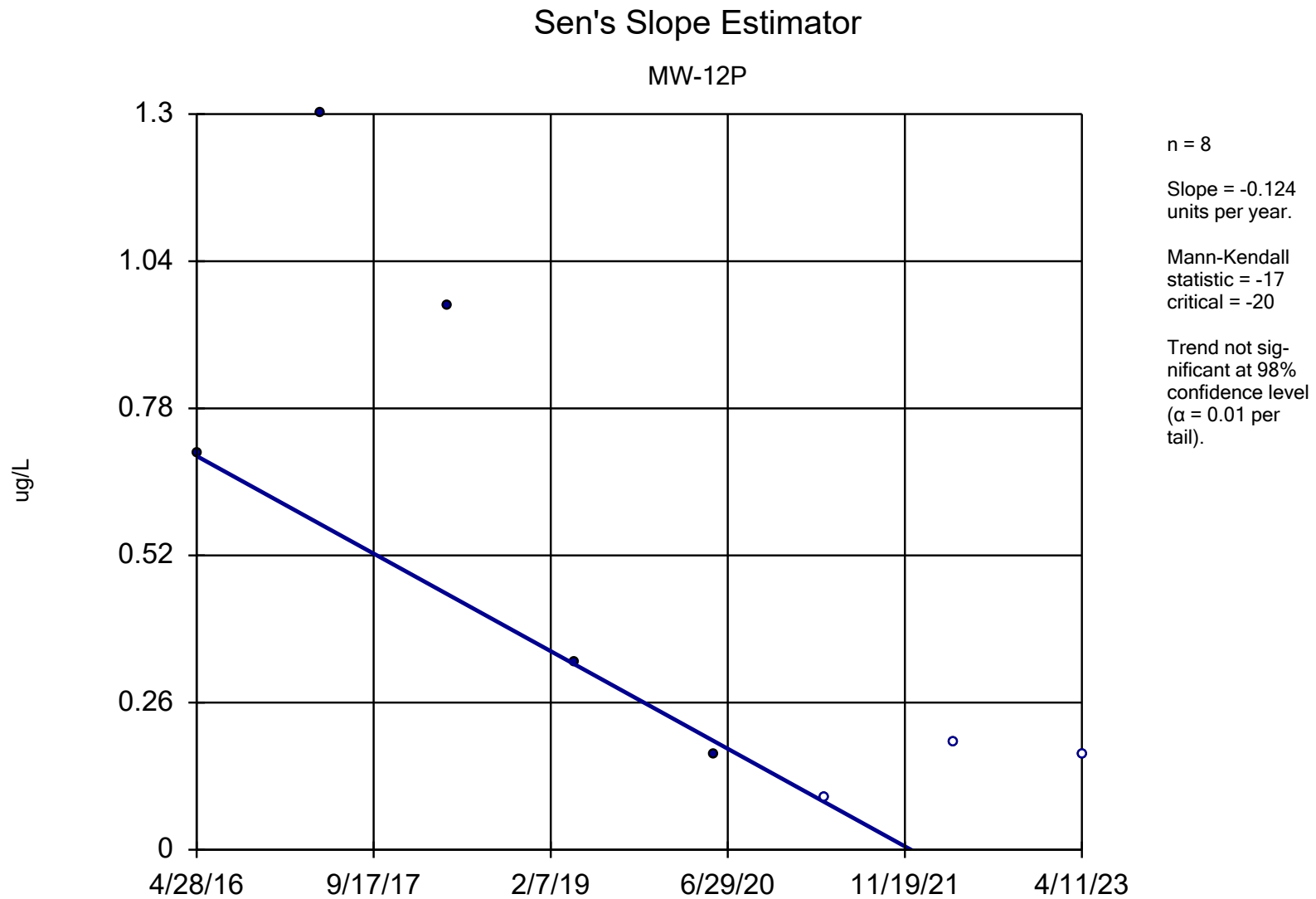
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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-12

4/28/2016	1.6
4/20/2017	2.2
4/17/2018	1.9
4/16/2019	2.2
5/21/2020	2
4/6/2021	1.9
4/6/2022	1.4
4/11/2023	1.2

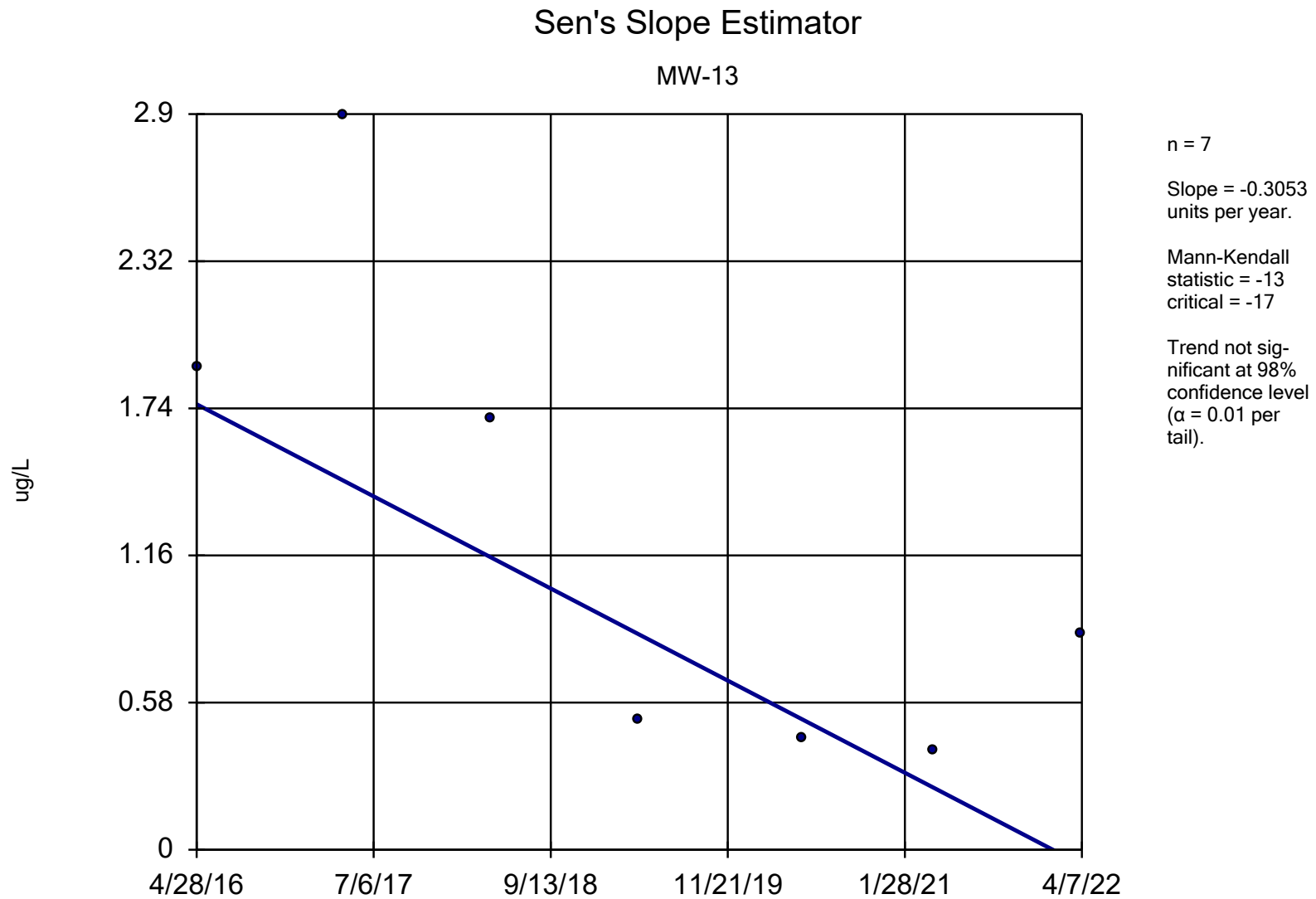


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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-12P
4/28/2016	0.7 (J)
4/20/2017	1.3
4/17/2018	0.96 (J)
4/16/2019	0.33 (J)
5/21/2020	0.17 (J)
4/6/2021	<0.091
4/6/2022	<0.19 (U)
4/11/2023	<0.17 (U)



Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

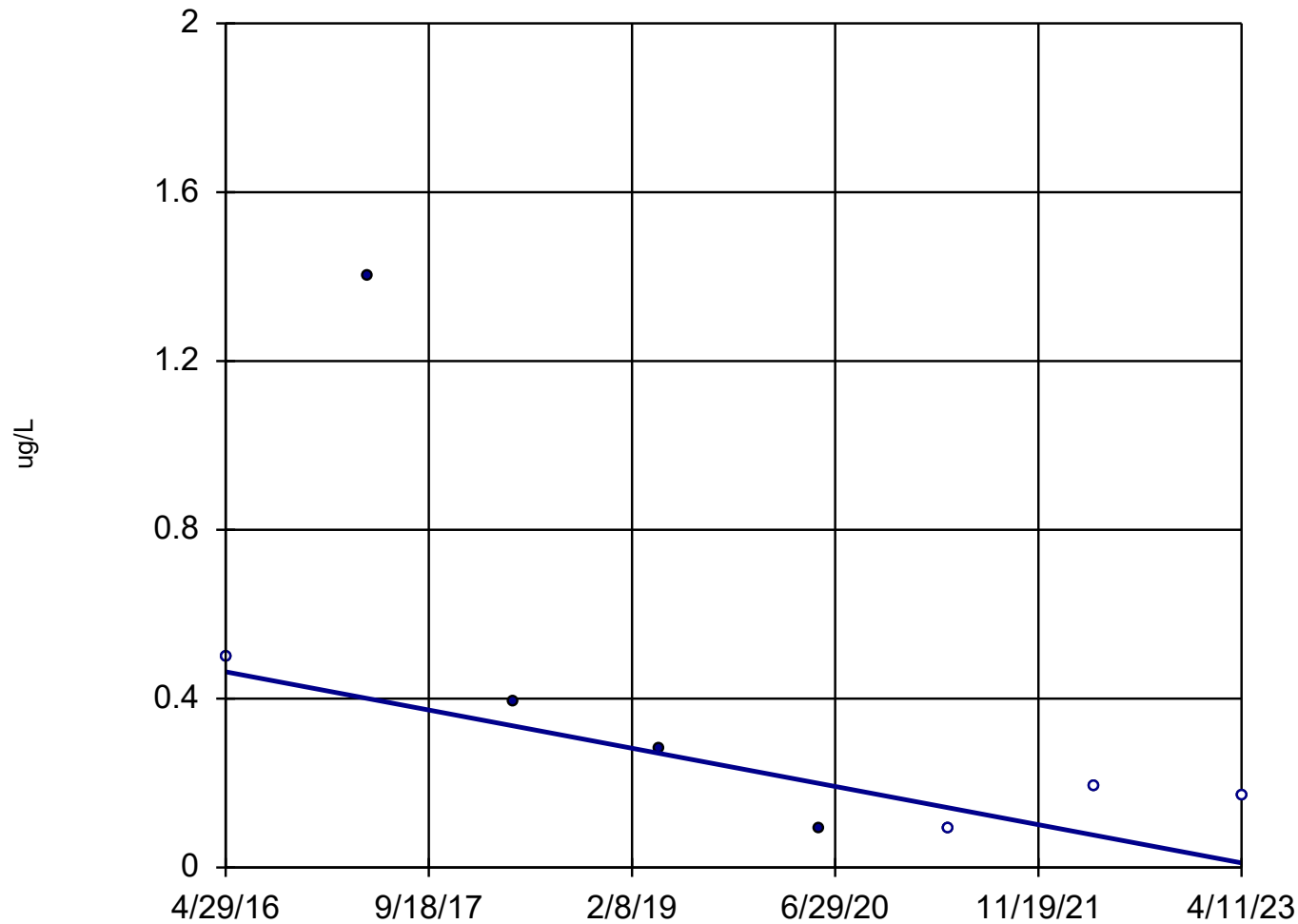
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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-13

4/28/2016	1.9
4/20/2017	2.9
4/17/2018	1.7
4/16/2019	0.51
5/21/2020	0.44 (J)
4/7/2021	0.39 (J)
4/7/2022	0.85

Sen's Slope Estimator

MW-14



n = 8

Slope = -0.0651
units per year.

Mann-Kendall
statistic = -18
critical = -20

Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

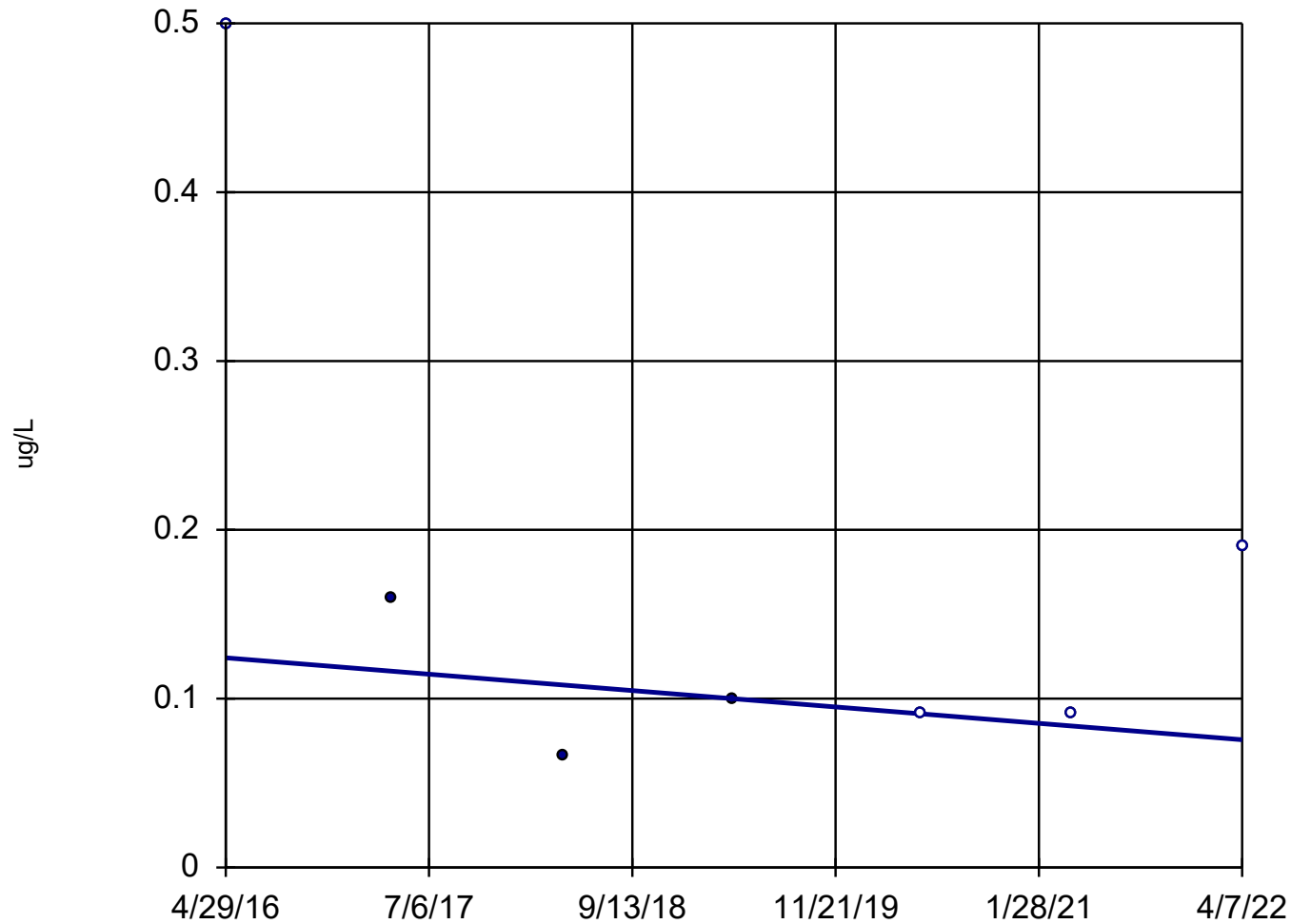
Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-14
4/29/2016	<0.5
4/20/2017	1.4
4/17/2018	0.39 (J)
4/15/2019	0.28 (J)
5/22/2020	0.092 (J)
4/7/2021	<0.091
4/6/2022	<0.19 (U)
4/11/2023	<0.17 (U)

Sen's Slope Estimator

MW-15



n = 7

Slope = -0.008172
units per year.

Mann-Kendall
statistic = -4
critical = -17

Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

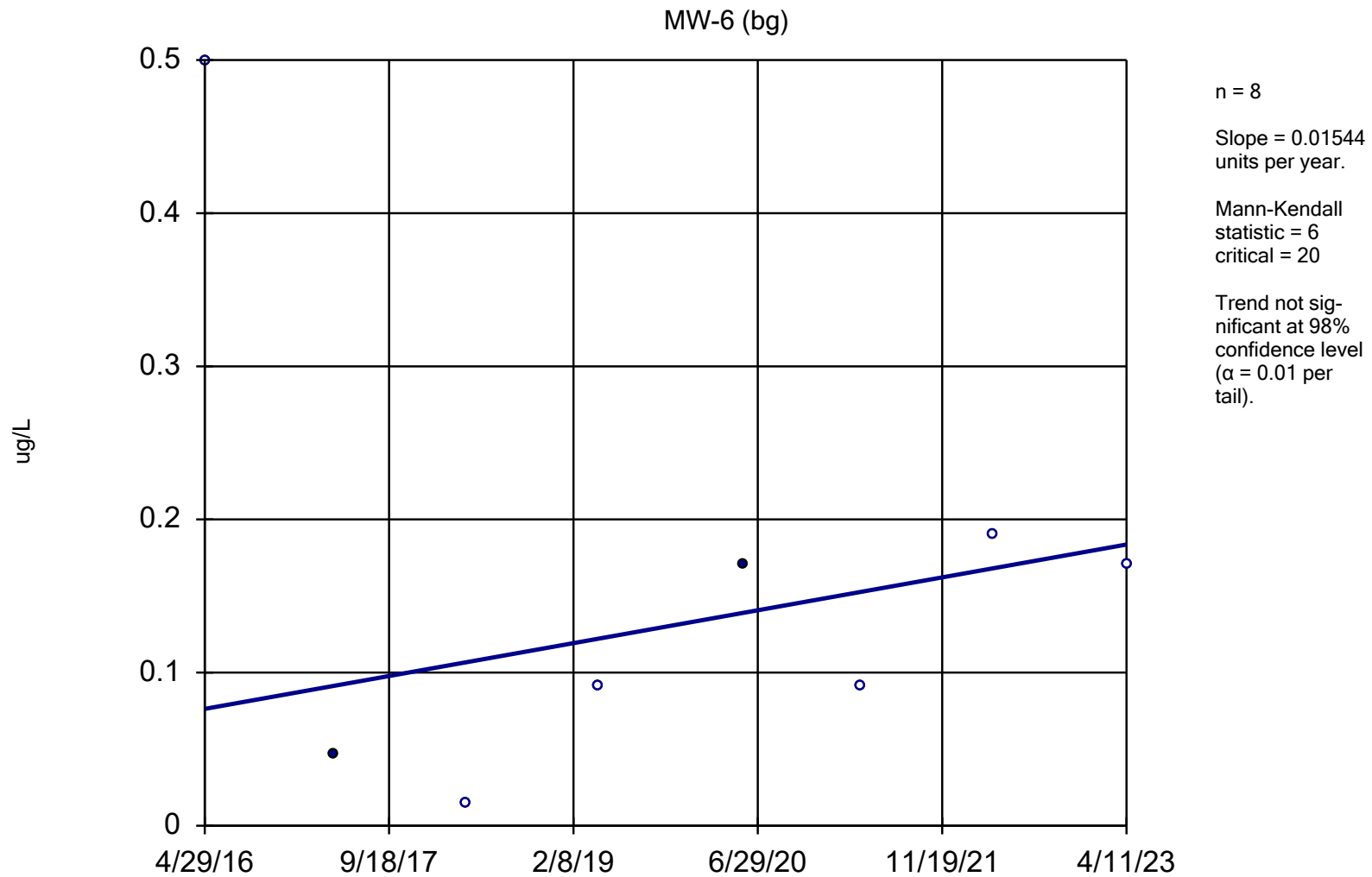
Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-15

4/29/2016	<0.5
4/20/2017	0.16 (J,B)
4/17/2018	0.066 (J)
4/16/2019	0.1 (J)
5/22/2020	<0.091
4/7/2021	<0.091
4/7/2022	<0.19 (U)

Sen's Slope Estimator



Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

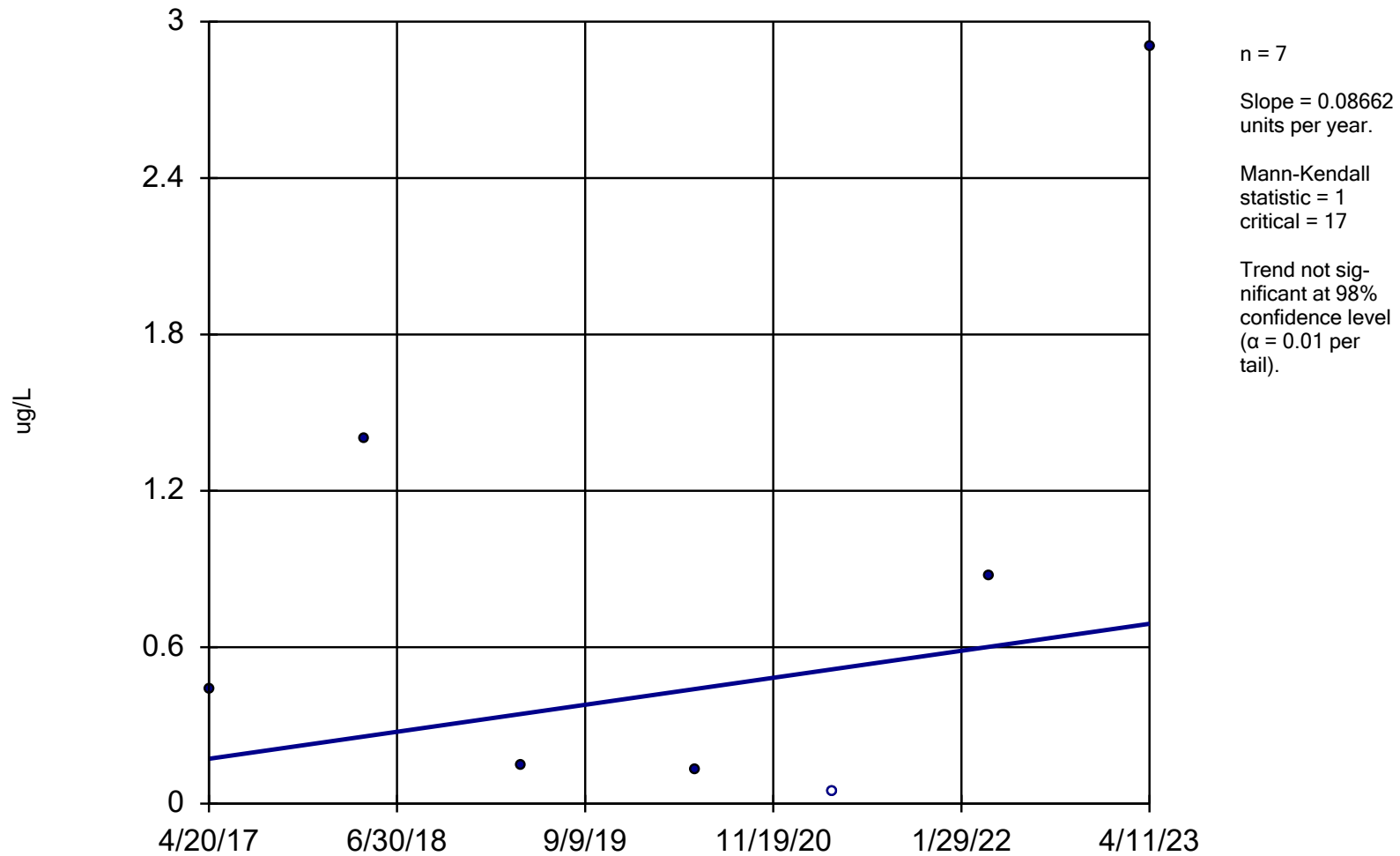
Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	<0.5
4/19/2017	0.047 (J,B)
4/16/2018	<0.014
4/15/2019	<0.091
5/20/2020	0.17 (J)
4/7/2021	<0.091
4/6/2022	<0.19 (U)
4/11/2023	<0.17 (U)

Sen's Slope Estimator

TW-18

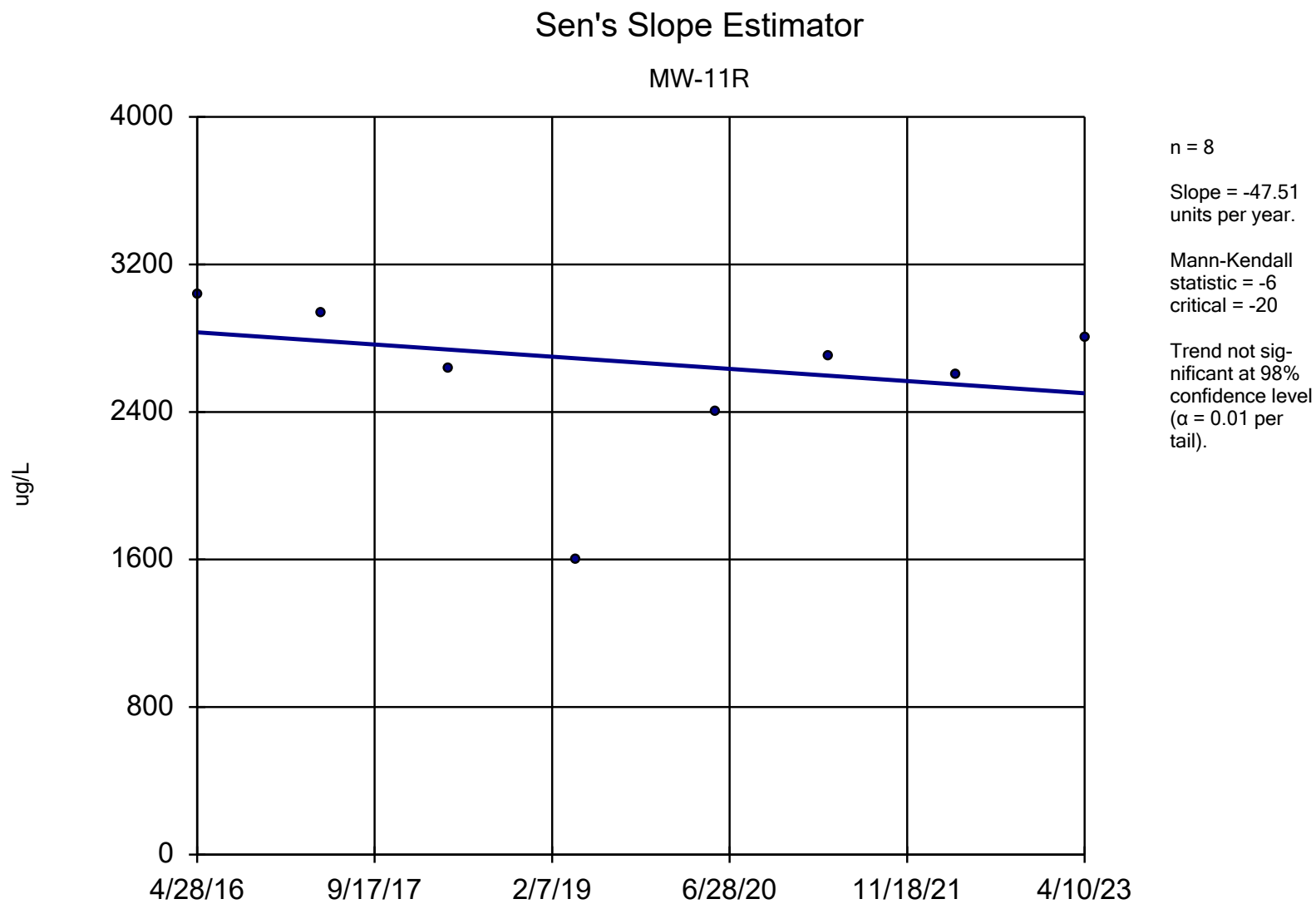


Constituent: Cobalt Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	TW-18
4/20/2017	0.44 (J)
4/17/2018	1.4
4/16/2019	0.15 (J)
5/22/2020	0.13 (J)
4/7/2021	<0.091
4/6/2022	0.87
4/11/2023	2.9



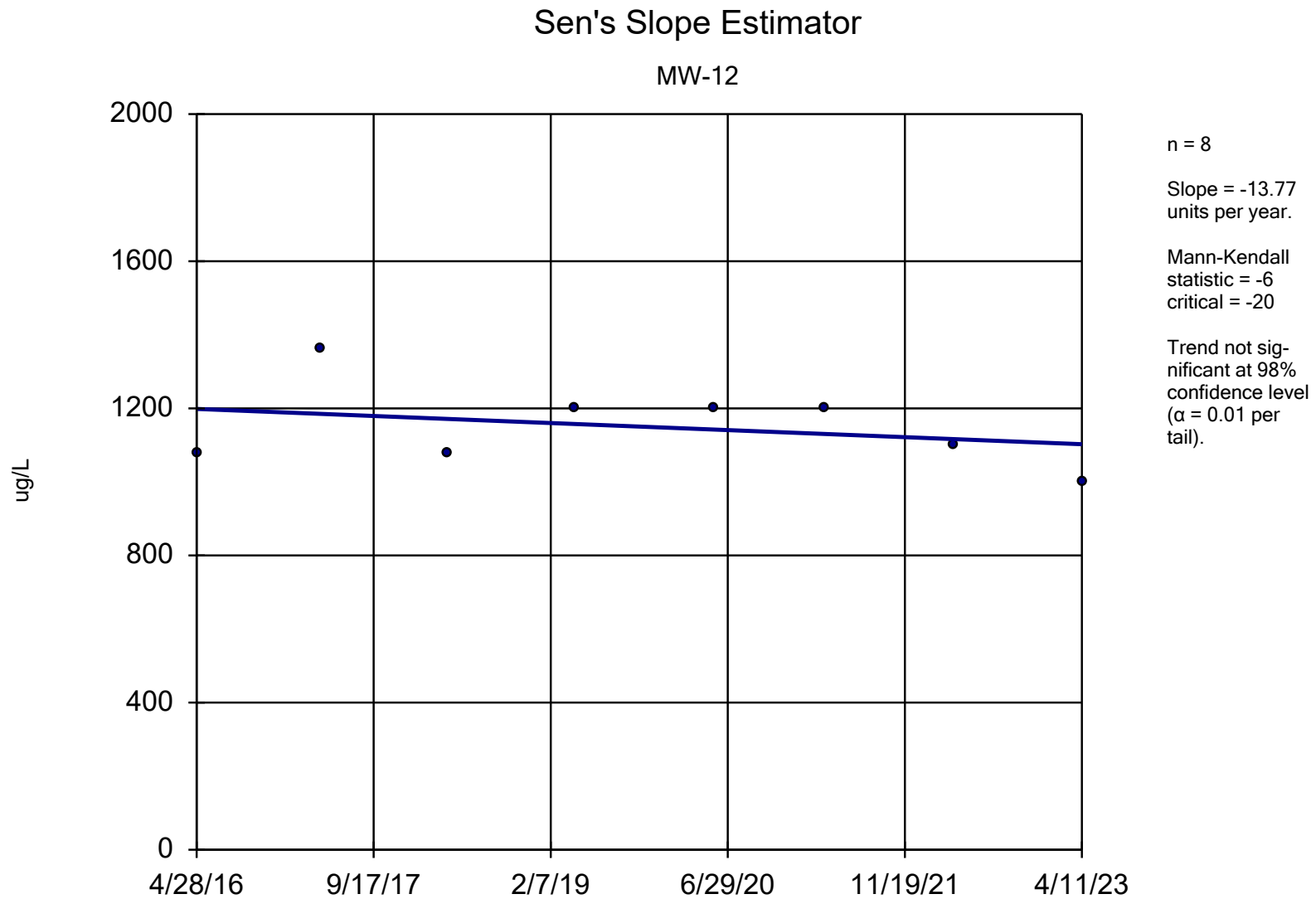
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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-11R

4/28/2016	3040
4/20/2017	2940
4/17/2018	2630
4/16/2019	1600
5/21/2020	2400
4/7/2021	2700
4/7/2022	2600
4/10/2023	2800



Constituent: Manganese Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

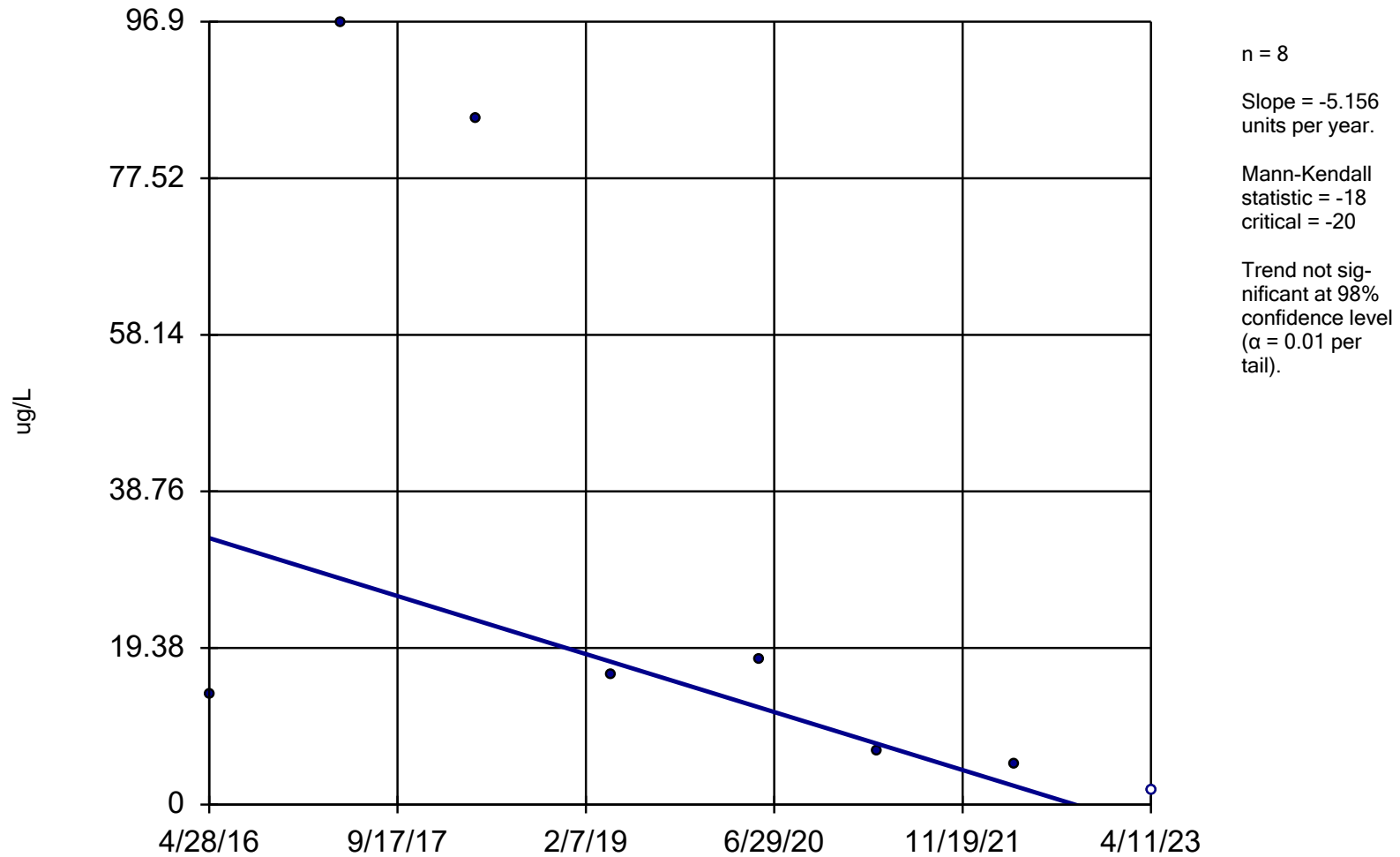
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Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-12

4/28/2016	1080
4/20/2017	1360
4/17/2018	1080
4/16/2019	1200
5/21/2020	1200
4/6/2021	1200
4/6/2022	1100
4/11/2023	1000

Sen's Slope Estimator

MW-12P

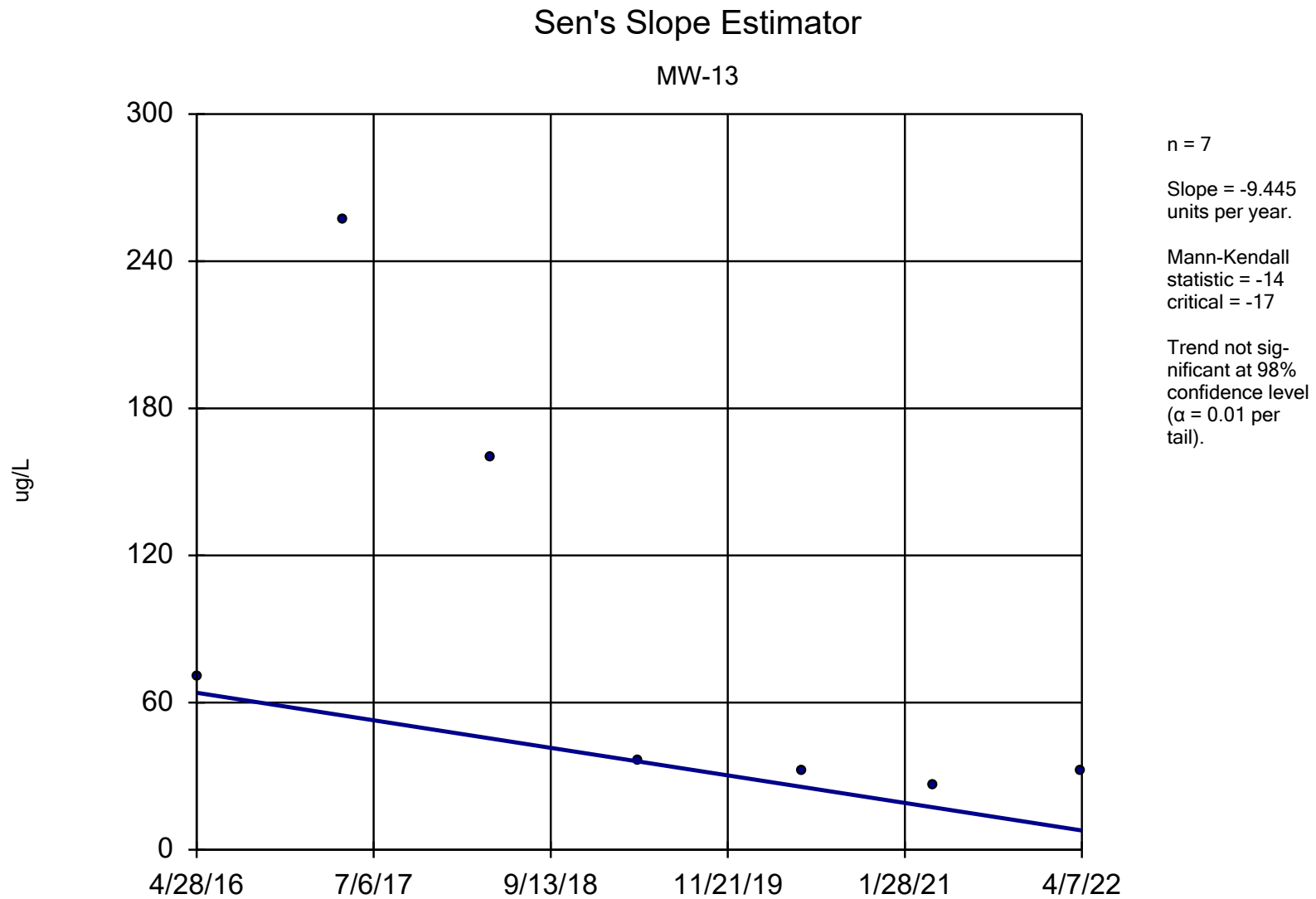


Constituent: Manganese Analysis Run 11/27/2023 4:55 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-12P
4/28/2016	13.7
4/20/2017	96.9
4/17/2018	84.8
4/16/2019	16
5/21/2020	18
4/6/2021	6.7 (J)
4/6/2022	4.9 (J)
4/11/2023	<3.6 (U)



Constituent: Manganese Analysis Run 11/27/2023 4:56 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

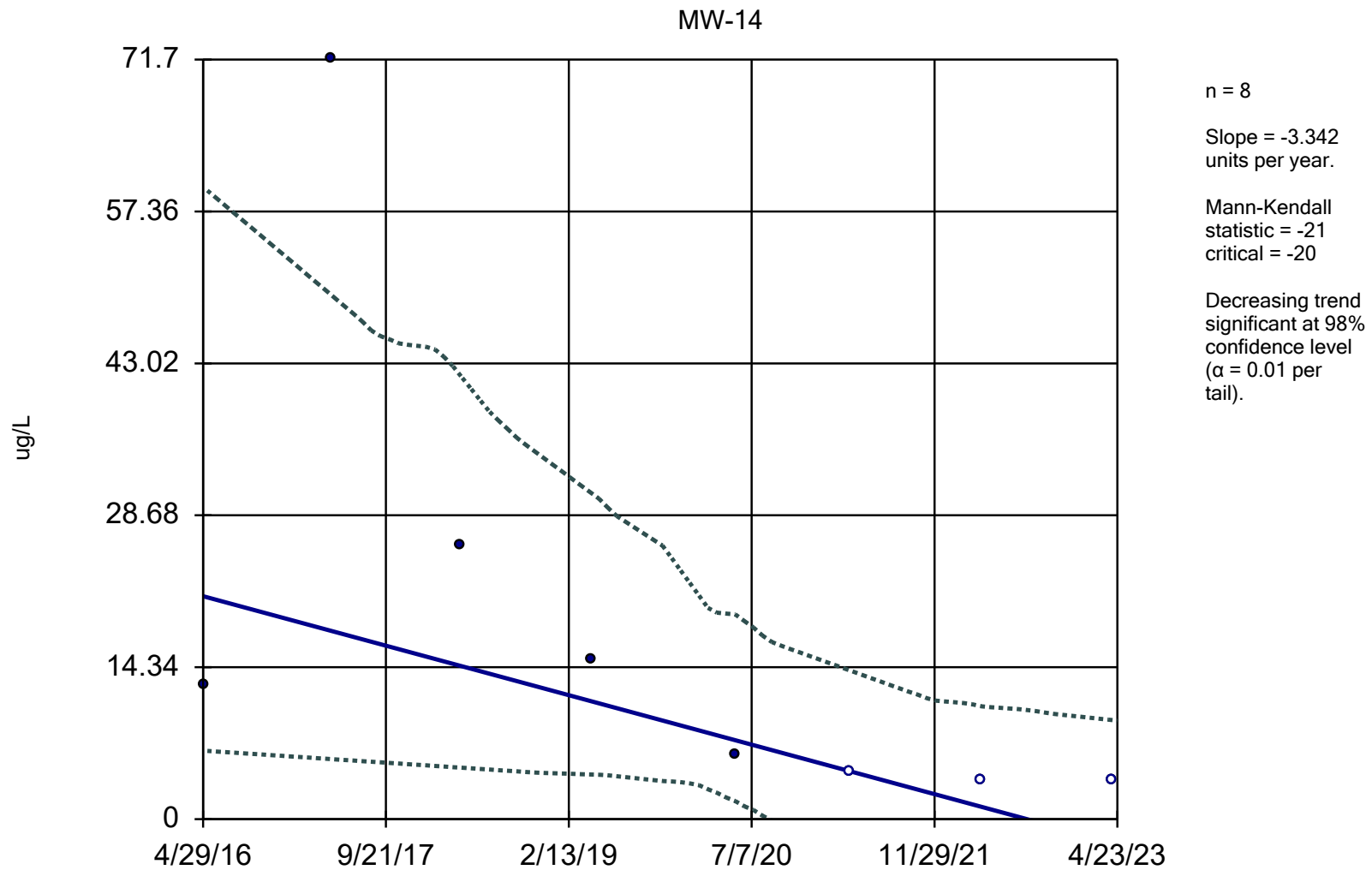
Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

MW-13

4/28/2016	70.4
4/20/2017	257
4/17/2018	160
4/16/2019	36
5/21/2020	32
4/7/2021	26
4/7/2022	32

Sen's Slope and 95% Confidence Band

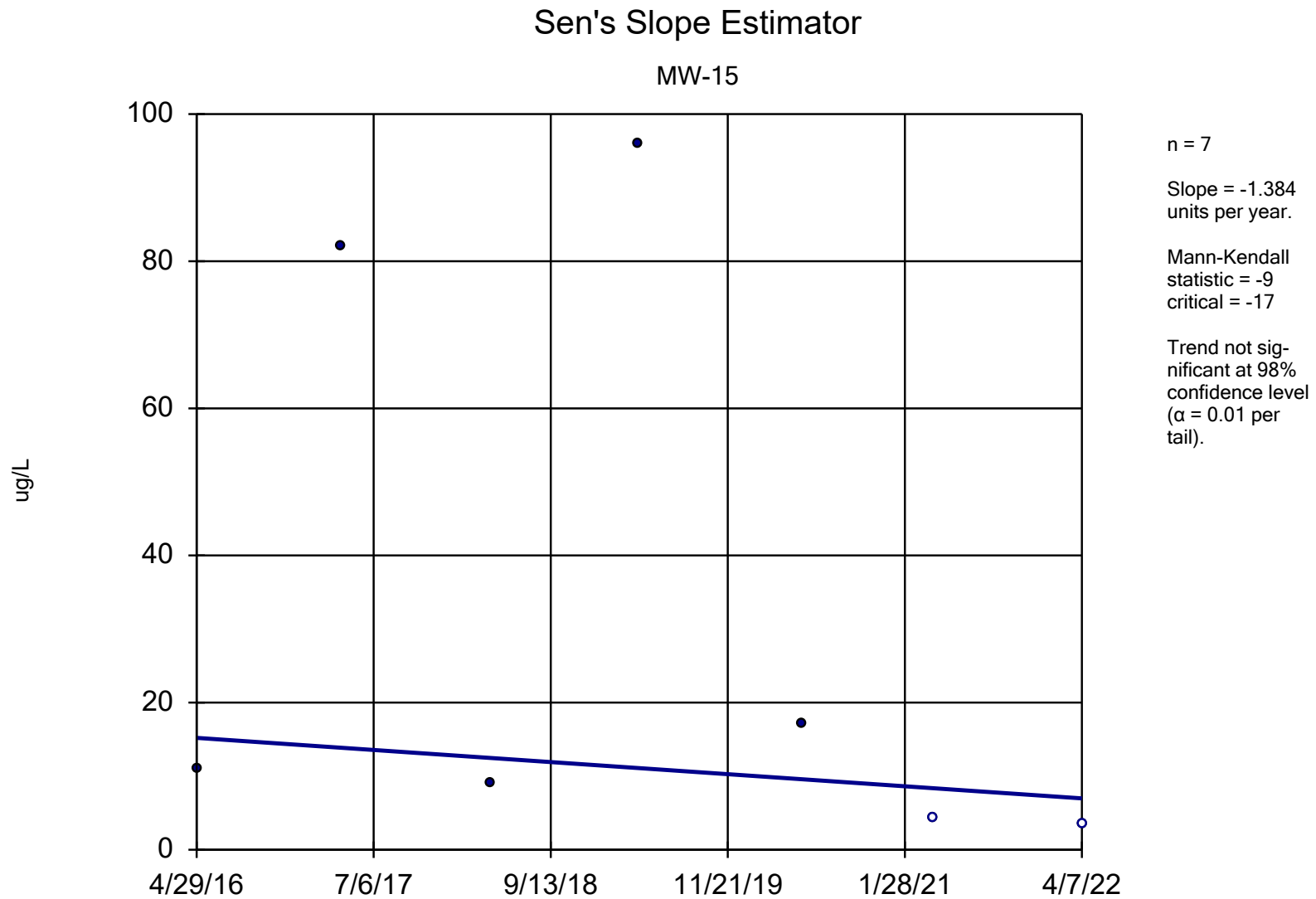


Constituent: Manganese Analysis Run 11/27/2023 4:56 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-14	LCL	UCL
4/29/2016	12.6	6.468	59.67
4/20/2017	71.7	5.672	49.52
4/17/2018	25.8	4.862	41.86
4/15/2019	15	4.219	30.82
5/22/2020	6 (J)	1.708	19.34
4/7/2021	<4.4	-5.086	14.03
4/6/2022	<3.6 (U)	-15.38	10.66
4/11/2023	<3.6 (U)	-30	9.346

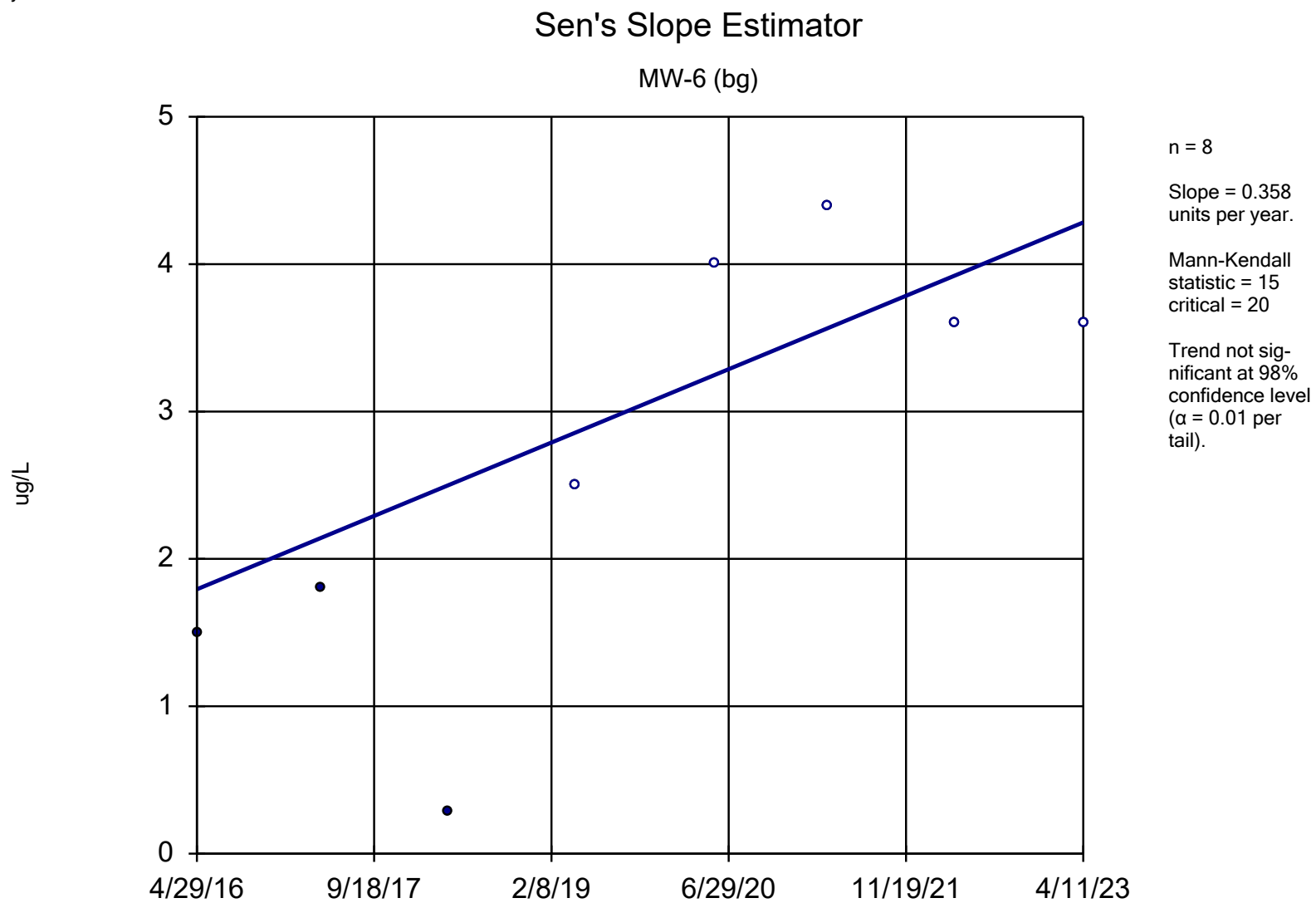


Constituent: Manganese Analysis Run 11/27/2023 4:56 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-15
4/29/2016	11.1
4/20/2017	82.1
4/17/2018	9.1
4/16/2019	96
5/22/2020	17
4/7/2021	<4.4
4/7/2022	<3.6 (U)

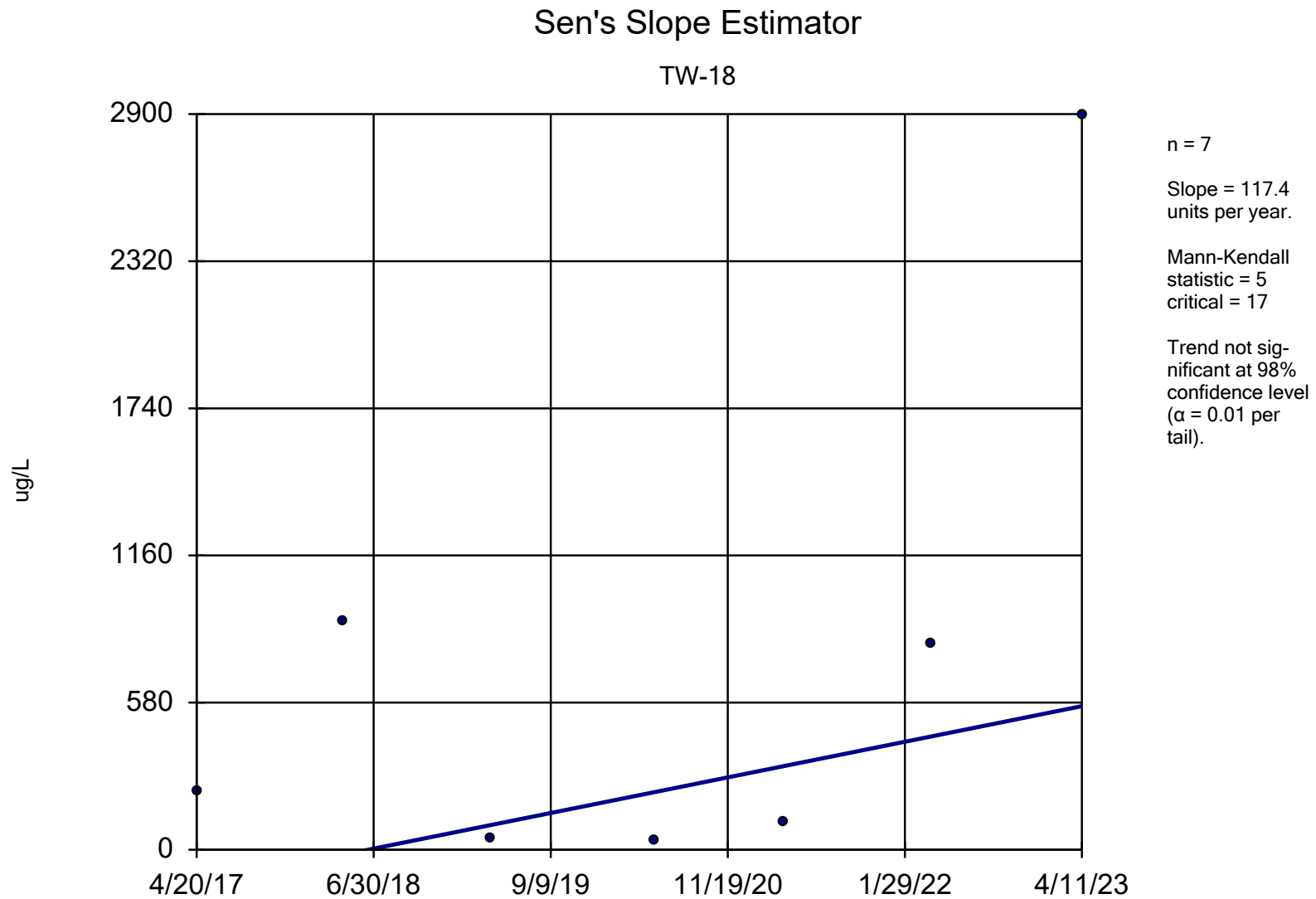


Constituent: Manganese Analysis Run 11/27/2023 4:56 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

	MW-6 (bg)
4/29/2016	1.5 (Y)
4/19/2017	1.8 (B)
4/16/2018	0.28 (J)
4/15/2019	<2.5
5/20/2020	<4
4/7/2021	<4.4
4/6/2022	<3.6 (U)
4/11/2023	<3.6 (U)



Constituent: Manganese Analysis Run 11/27/2023 4:56 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

Sen's Slope Estimator

Constituent: Manganese (ug/L) Analysis Run 11/27/2023 4:57 PM View: Lansing State Data
Lansing Generating Station Client: SCS Engineers Data: LAN - 2016 thru 2020 Data additions

TW-18
227
897
43
40
110
810
2900

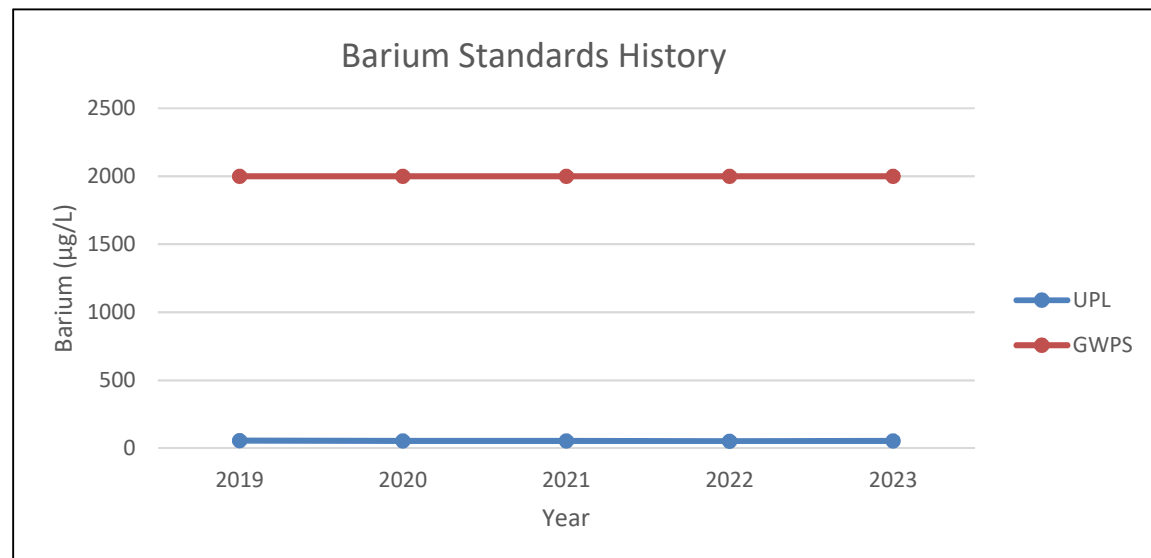
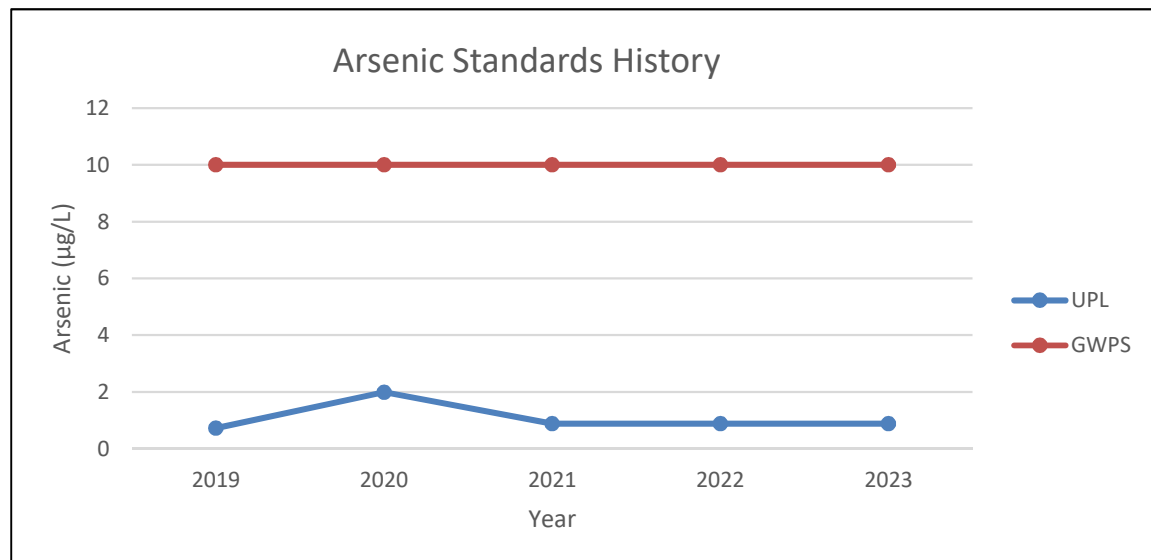
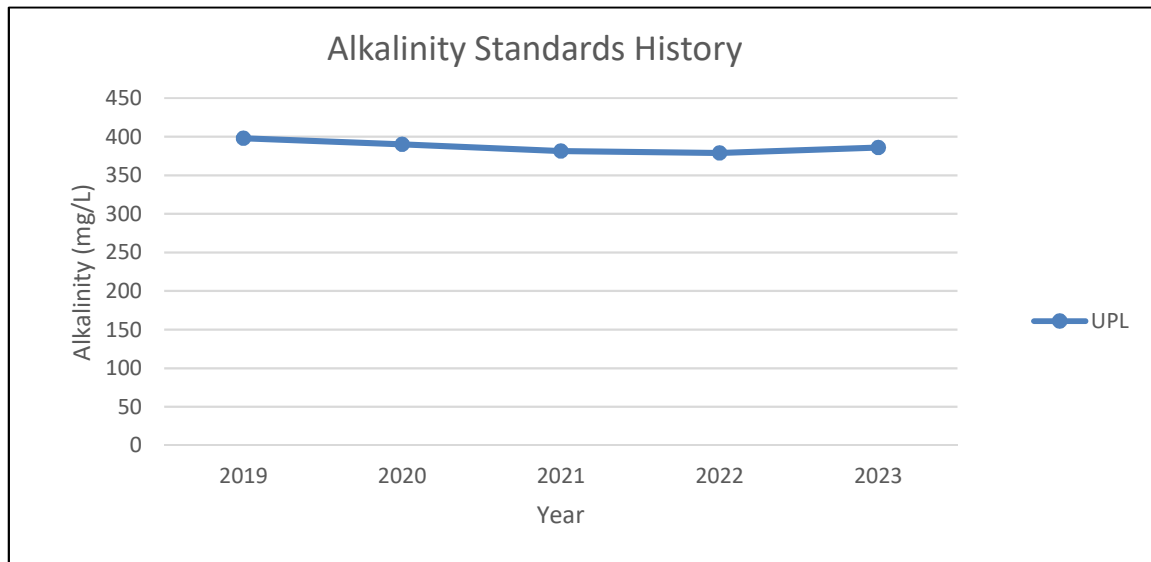
4/20/2017
4/17/2018
4/16/2019
5/22/2020
4/7/2021
4/6/2022
4/11/2023



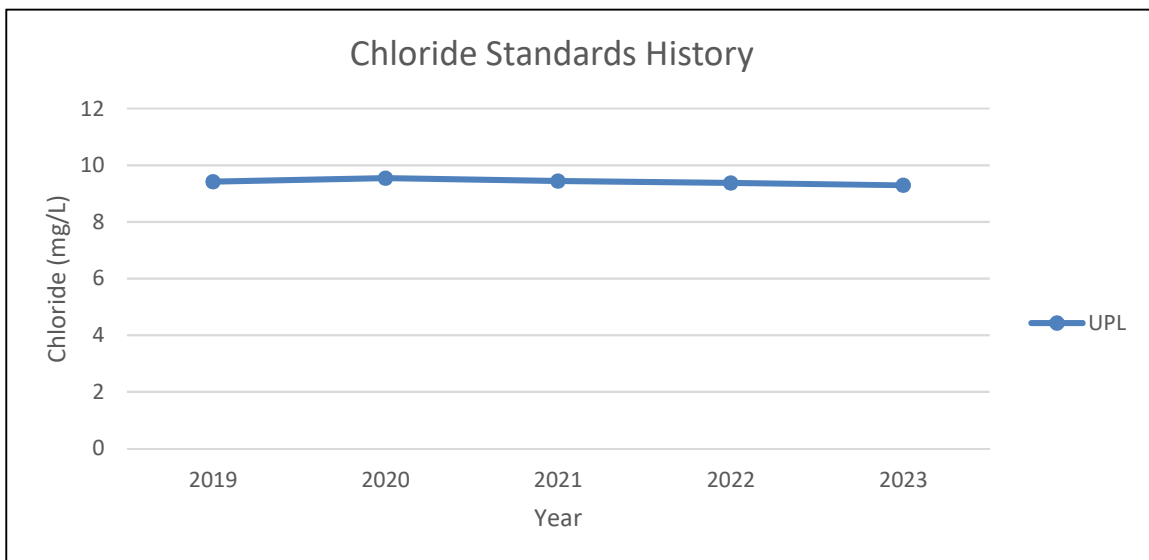
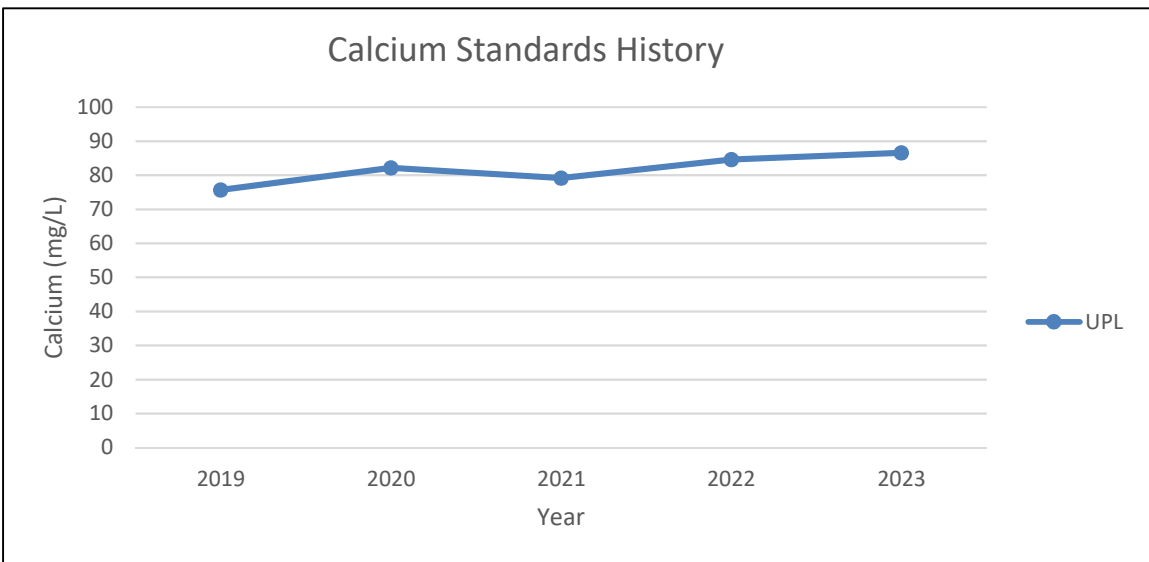
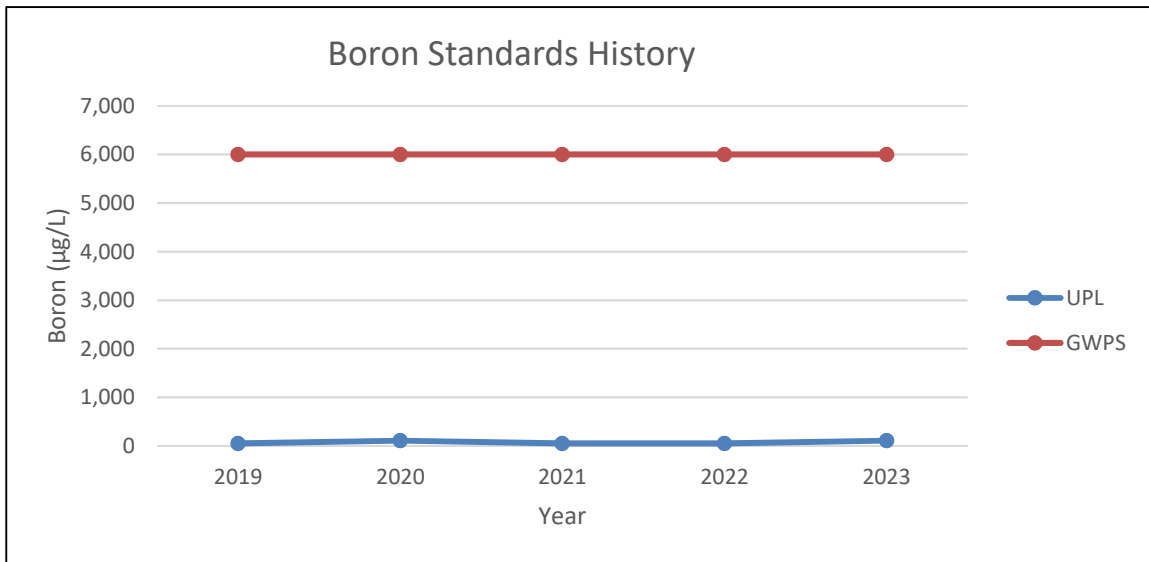
Appendix F

Standards History Graphs

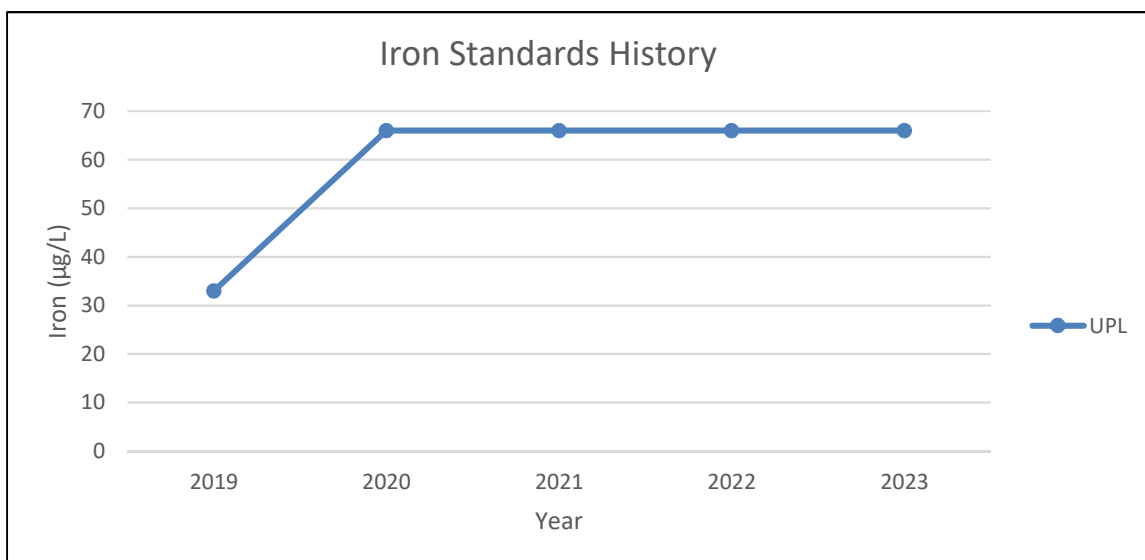
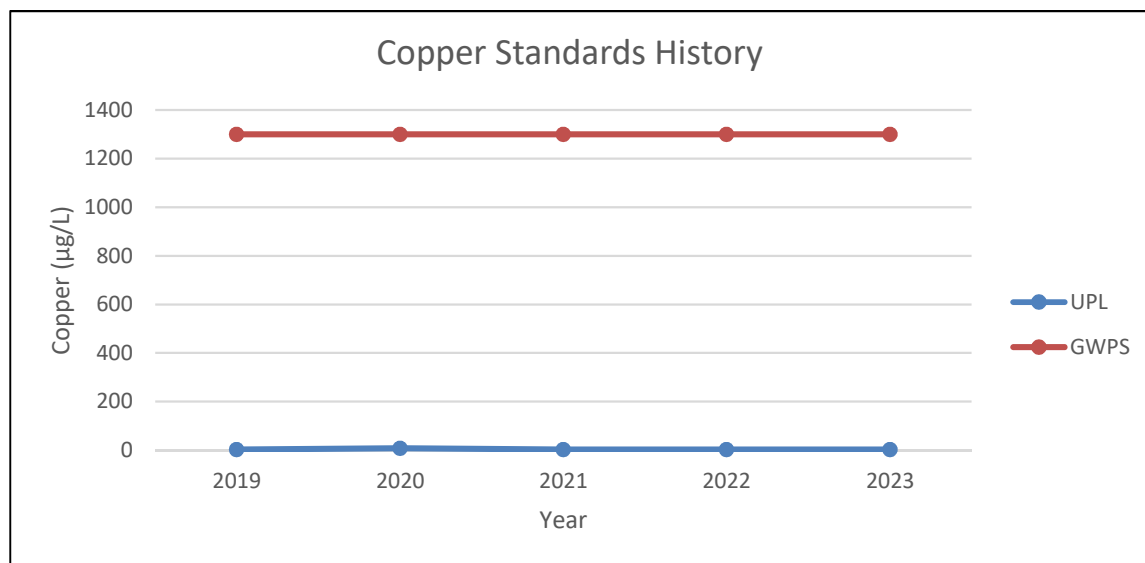
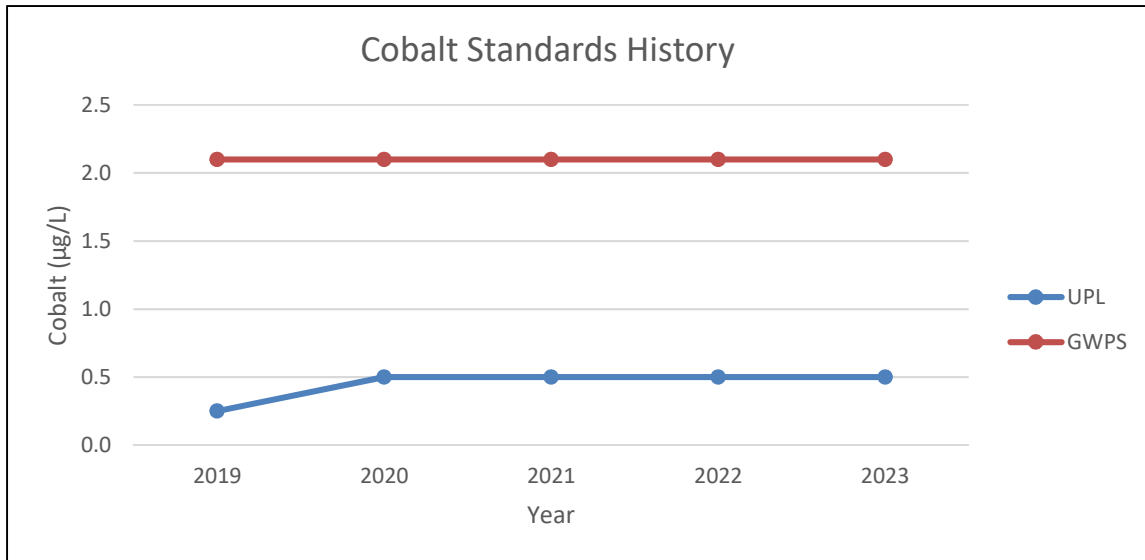
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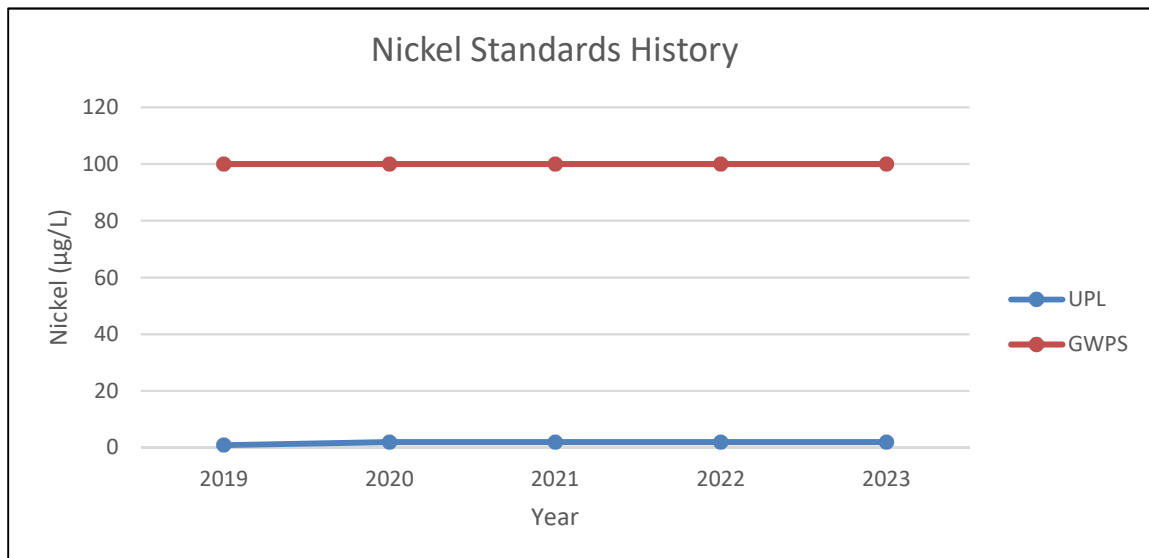
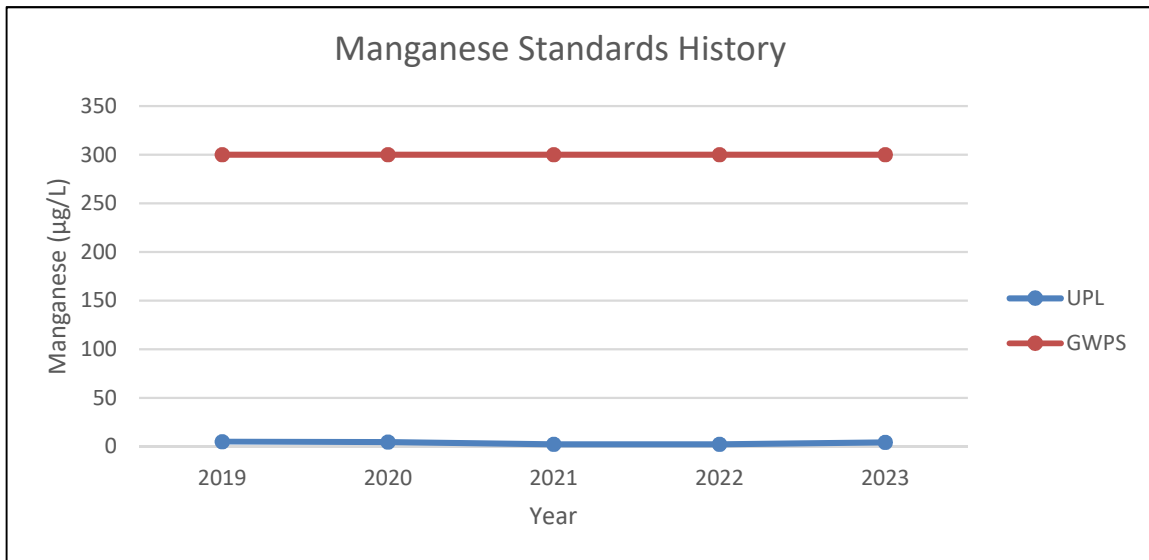
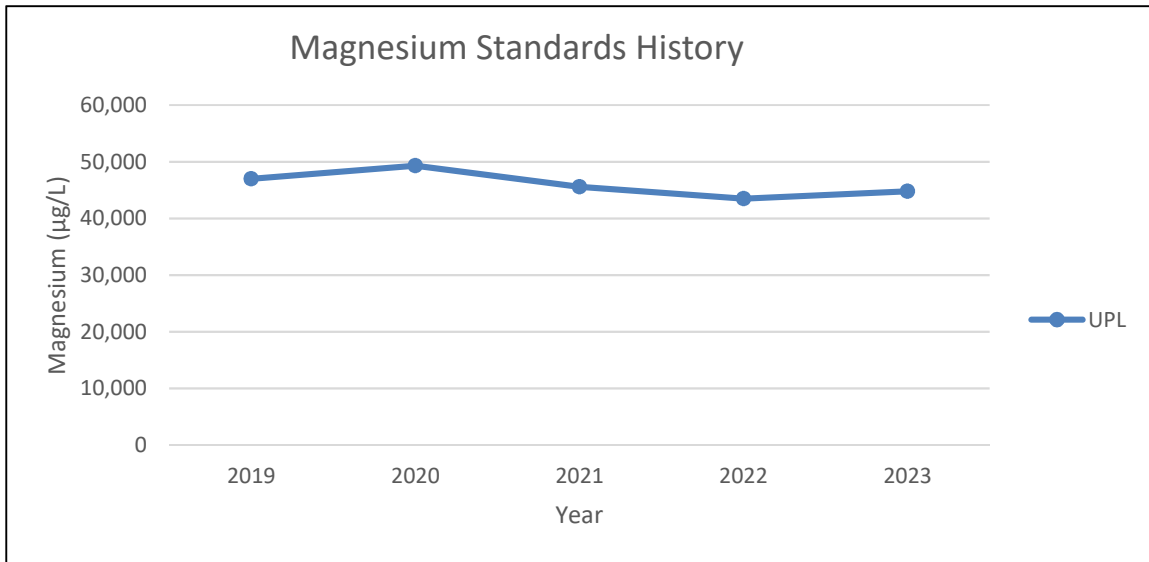
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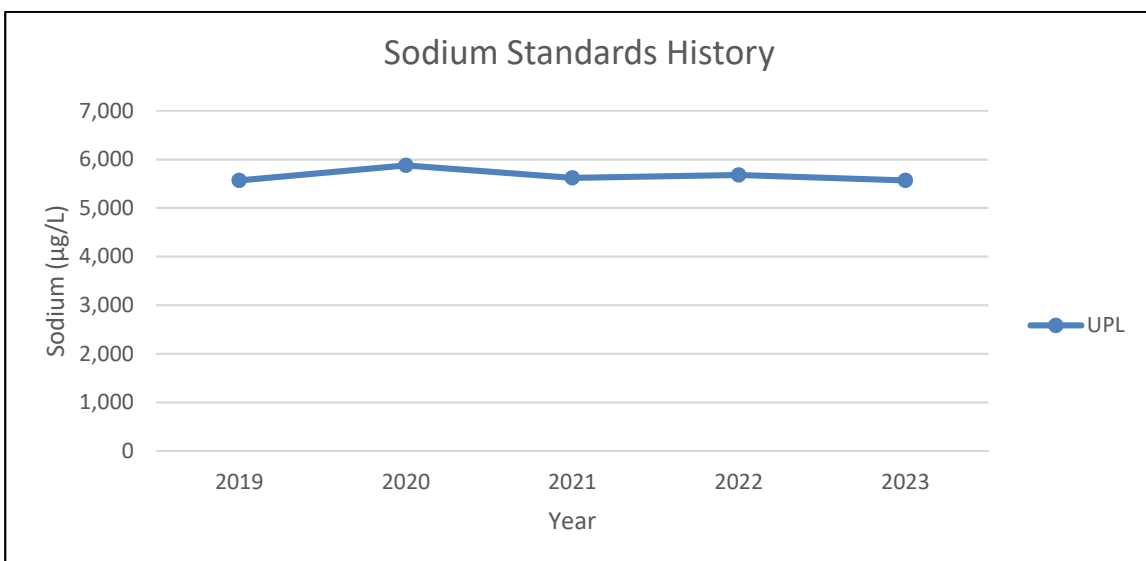
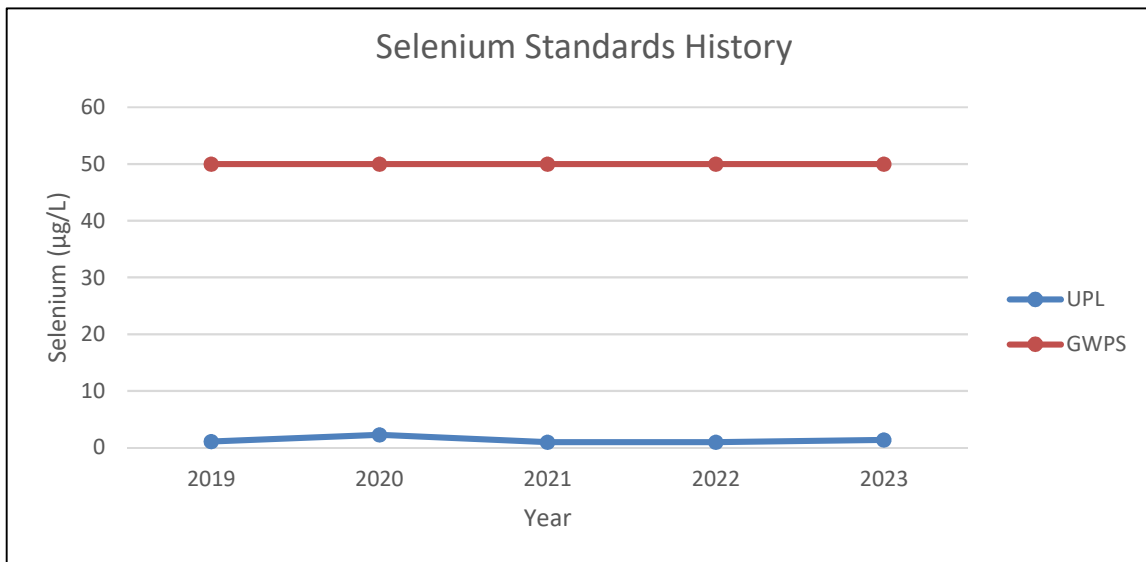
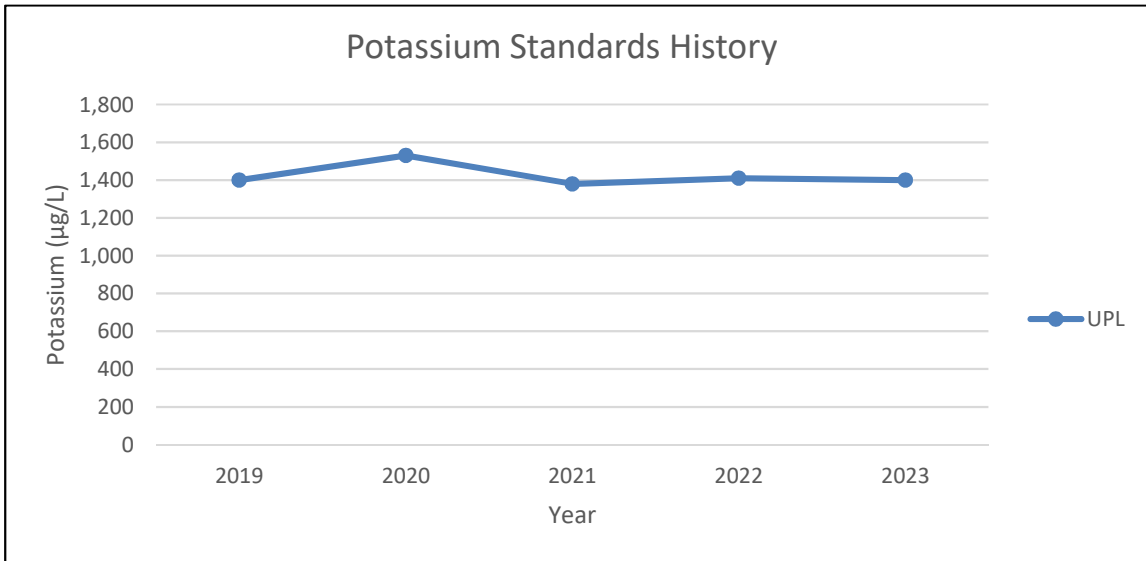
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