2021 Annual Groundwater Monitoring Report

Range Road Coal Combustion Residual Landfill
3600 Range Road
China Township, Michigan

January 2022

Prepared For:

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On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended. The CCR Rule, which became effective on October 19, 2015 (with amendments in 2018 and 2020), applies to the DTE Electric Company (DTE Electric) Range Road Coal Combustion Residual Landfill (RRLF) CCR unit. Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of DTE Electric, TRC Engineers Michigan, Inc., the engineering entity of TRC, has prepared this 2021 Annual Groundwater Monitoring Report for calendar year 2021 activities at the RRLF CCR unit.

DTE remained in detection monitoring at the RRLF CCR unit in 2021. The semiannual detection monitoring events for 2021 were completed in May and October 2021 and included sampling and analyzing groundwater within the groundwater monitoring system for the indicator parameters listed in Appendix III to the CCR Rule. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify statistically significant increases (SSIs) in detection monitoring parameters to determine if concentrations in detection monitoring well samples exceed background levels. Detection monitoring data that has been collected and evaluated in 2021 are presented in this report.

Potential SSIs over background limits were noted for several Appendix III constituents in one or more downgradient wells during the May and October 2021 monitoring events. These potential SSIs were either not statistically significant (i.e. verification resampling did not confirm the exceedance) or were evaluated and determined to be a result of natural variability as documented in an alternative source demonstration (ASD) for the May 2021 event and not attributable to the RRLF CCR unit. DTE Electric is in the process of performing an ASD to further evaluate a total dissolved solids (TDS) SSI at MW-16-06 for the October 2021 monitoring event. Therefore, detection monitoring will be continued at the RRLF CCR unit in accordance with §257.94 of the CCR Rule pending completion of a successful ASD. With the presence of the vertically and horizontally extensive clay-rich confining till beneath the RRLF CCR unit, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from operations.

1.0 Introduction

1.1 Program Summary

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended. The CCR Rule, which became effective on October 19, 2015 (with amendments in 2018 and 2020), applies to the DTE Electric Company (DTE Electric) Range Road Coal Combustion Residual Landfill (RRLF) CCR unit. Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of DTE Electric, TRC Engineers Michigan, Inc., the engineering entity of TRC, has prepared this Annual Groundwater Monitoring Report for calendar year 2021 activities at the RRLF CCR unit (2021 Annual Report).

This 2021 Annual Report presents the monitoring results and the statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule) for the May and October 2021 semiannual groundwater monitoring events for the RRLF CCR unit in addition to the ASD for the first semiannual 2021 detection monitoring event (Appendix A). Detection monitoring for these events continued to be performed in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Range Road Landfill* (QAPP) (TRC, July 2016; revised August 2017) and statistically evaluated per the *Groundwater Statistical Evaluation Plan – DTE Electric Company Range Road Coal Combustion Residual Landfill* (Stats Plan) (TRC, October 2017). As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify SSIs of detection monitoring parameters compared to background levels.

1.2 Site Overview

The RRLF is located in Section 12, Township 4 North, Range 16 East, 3600 Range Road, China Township in St. Clair County, Michigan. The site occupies approximately 514 acres and is one-half mile west of the St. Clair River and one mile north of the Belle River Power Plant. Prior to Detroit Edison's operations commencing in the 1950s, the RRLF property was used as farmland. The property has been used continuously as a coal ash landfill since Detroit Edison Company (now DTE Electric) began coal ash landfilling operations at the RRLF in the 1950s and is constructed over a natural confining, low permeability clay-rich soil base that serves as an underlying soil barrier. The RRLF property consists of approximately 514 acres of which approximately 402 acres are designated for landfill development. CCR currently occupies approximately 200 acres of the RRLF.

The RRLF is a licensed Coal Ash Landfill in accordance with Michigan's regulations, and is owned and operated by DTE Electric. The disposal facility currently accepts coal ash from DTE Electric's St. Clair and Belle River power plants, from the now inactive former DTE Electric Harbor Beach power plant and has historically accepted coal ash from the former DTE Electric Marysville power plant. The RRLF is operated under the current operating license number 9395

in accordance with Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended.

1.3 Geology/Hydrogeology

The RRLF CCR unit is located approximately one-half mile west of the St. Clair River. In general, the RRLF is underlain by 86 to as much as 188 feet of laterally extensive low hydraulic conductivity silty clay-rich deposits. On the eastern portion and northwest corner of RRLF some thin partially saturated silty sand near-surface deposits are present. These deposits are not laterally contiguous, are not in communication with the deeper uppermost aquifer, do not yield a useable quantity of groundwater, and thus are not considered an aquifer per the CCR Rule. On a significant portion of the RRLF, there is a bedrock valley that trends from the northeast corner to the south-central area of the site. The valley is incised in the Bedford and/or Antrim Shale bedrock and filled with unconsolidated glacial deposits consisting of clay, silt, sand and/or gravel. Based on historical oil well logs from the RRLF area, the bedrock valley extends to depths of up to 303 feet below ground surface (ft bgs). Along the western portion of the RRLF, clay-rich till is present continuously to the top of the underlying Bedford or Antrim Shale bedrock in the area of SB-16-01 and SB-16-02 (Figure 1), creating a no flow boundary.

Groundwater within the uppermost aquifer sand/gravel is confined and protected from the CCR unit by the overlying clay-rich aquitard. The top of the sand/gravel uppermost aquifer encountered at each of the CCR monitoring wells and soil borings is at significantly different elevations across the RRLF that, where present, is first encountered at depths ranging from 86 to 196 ft bgs, immediately beneath the overlying clay-rich aquitard. The variability in boring/well depths is a consequence of the heterogeneity of the glacial deposits and is driven by the limited continuity of the coarse-grained sand and gravel outwash within the overlying/encapsulating fine-grained, silty clay till that confines the uppermost aquifer. In addition, there is an apparent lack of interconnection and/or significant vertical variation between the various uppermost aquifer sand and/or gravel units encountered across the RRLF CCR unit.

Given the horizontally expansive clay with substantial vertical thickness, the heterogeneity of the glacial deposits (with the top of the uppermost aquifer elevation across the RRLF CCR unit varying up to 100 feet vertically), the no-flow boundary to the west, and the lack of hydraulic interconnectedness of the uppermost aquifers encountered at the site in some areas, it is not appropriate to infer horizontal flow direction or gradients across the site. If CCR affected groundwater were able to penetrate the clay-rich underlying confining till, it would travel radially away from the RRLF. However, with the presence of the vertically and horizontally extensive clay-rich confining till beneath the RRLF CCR unit, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from operations that began in the 1950s.

2.0 Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for the RRLF CCR unit as detailed in the *Groundwater Monitoring System Summary Report – DTE Electric Company Range Road Coal Combustion Residual Landfill* (GWMS Report) (TRC, October 2017). The detection monitoring well network for the RRLF CCR unit currently consists of seven monitoring wells that are screened in the uppermost aquifer. Monitoring wells MW-16-01 through MW-16-07 are located around the north, east and south perimeter of the RRLF and provide data on both background and downgradient groundwater quality that has not been affected by the CCR unit (total of seven background/downgradient monitoring wells). The monitoring well locations are shown on Figure 2.

2.2 Semiannual Groundwater Monitoring

The semiannual monitoring parameters for the detection groundwater monitoring program were selected per the CCR Rule's Appendix III to Part 257 – Constituents for Detection Monitoring. The Appendix III indicator parameters consist of boron, calcium, chloride, fluoride, pH (field reading), sulfate, and total dissolved solids (TDS) and were analyzed in accordance with the sampling and analysis plan included within the QAPP. In addition to pH, the collected field parameters included dissolved oxygen, oxidation reduction potential, specific conductivity, temperature, and turbidity.

2.2.1 Data Summary

The first semiannual groundwater detection monitoring event for 2021 was performed May 17 through 19, 2021 by TRC personnel and samples were analyzed by Eurofins TestAmerica (Eurofins) in accordance with the QAPP. Static water elevation data were collected at all seven monitoring well locations. Groundwater samples were collected from the seven detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the May 2021 event is provided on Table 1 (static groundwater elevation data), Table 2 (field data), and Table 3 (analytical results).

The second semiannual groundwater detection monitoring event for 2021 was performed October 18 and 19, 2021 by TRC personnel and samples were analyzed by Eurofins in accordance with the QAPP. Static water elevation data were collected at all seven monitoring well locations. Groundwater samples were collected from the seven detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the October 2021 event is provided on Table 1 (static groundwater elevation data), Table 2 (field data), and Table 4 (analytical results). The laboratory analytical reports are included in Appendix B.

2.2.2 Data Quality Review

Data from each round were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the CCR monitoring

program. Data quality reviews are summarized in Appendix C.

2.2.3 Groundwater Flow Rate and Direction

As presented in the GWMS Report, and mentioned above, given the horizontally expansive clay with substantial vertical thickness, the heterogeneity of the glacial deposits (with the top of the uppermost aquifer elevation across the RRLF CCR unit varying up to 100 feet vertically), the no-flow boundary to the west, and the lack of hydraulic interconnectedness of the uppermost aquifers encountered at the site in some areas, it is not appropriate to infer horizontal flow direction or gradients across the site. Groundwater elevations measured across the Site during the May 2021 sampling event are provided on Table 1 and are summarized in plan view on Figure 3. Groundwater elevations measured across the Site during the October 2021 sampling event are provided on Table 1 and are summarized in plan view on Figure 4.

Groundwater elevation data collected during the most recent sampling event show that groundwater conditions within the uppermost aquifer are consistent with previous monitoring events and continue to demonstrate that the groundwater monitoring wells are appropriately positioned to detect the presence of Appendix III parameters that could potentially migrate from the RRLF CCR unit.

3.0 Statistical Evaluation

3.1 Establishing Background Limits

As discussed in the Stats Plan, intrawell statistical methods for RRLF were selected based on the geology and hydrogeology at the Site (primarily the presence of clay/hydraulic barrier, the variability in the presence of the uppermost aquifer across the site, and the presence of a no flow boundary on the west side of the aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data). An intrawell statistical approach requires that each downgradient well doubles as a background and compliance well, where data from each individual well during a detection monitoring event is compared to a statistical limit developed using the background dataset from that same well.

Per the Stats Plan, background limits were established for the Appendix III indicator parameters following the collection of at least eight background monitoring events using data collected from each of the seven established detection monitoring wells (MW-16-01 through MW-16-07). The initial statistical evaluation of the background data is presented in the 2017 Annual Report. The Appendix III background limits for each monitoring well will be used throughout the detection monitoring period to determine whether groundwater has been impacted from the RRLF CCR unit by comparing concentrations in the detection monitoring wells to their respective background limits for each Appendix III indicator parameter.

Prediction limits are periodically updated to reflect the additional data and additional temporal variability observed subsequent to the initial statistical limit calculation in 2018. The Appendix III prediction limits at the RRLF were updated in December 2021 to incorporate additional data collected since 2017 as presented in the December 15, 2021 Technical Memorandum, *Uppermost Useable Aquifer Prediction Limit Update – DTE Electric Company, Range Road Coal Combustion Residual Landfill* included as Appendix D. The updated prediction limits were used to statistically evaluate Appendix III indicator parameters for the second semiannual 2021 detection monitoring event.

3.2 Data Comparison to Background Limits – First 2021 Semiannual Event (May 2021)

For each semiannual monitoring event, the concentrations of the indicator parameters in each of the detection monitoring wells (MW-16-01 through MW-16-07) were compared to their respective statistical background limits.

The comparisons for the May 2021 monitoring event are presented on Table 3. The statistical evaluation of the May 2021 Appendix III indicator parameters showed potential initial SSIs over background for:

- TDS at MW-16-04; and
- Sulfate at MW-16-05.

The calcium and sulfate exceedances at MW-16-06, and the chloride exceedance at MW-16-07 during the First 2021 Semiannual Event have been previously demonstrated to be from natural variability and are not from the CCR unit as presented in various ASDs that were included in the *2018 Annual Groundwater Monitoring Report* (2018 GWMR)(TRC, January 2019), and *2019 Annual Groundwater Monitoring Report* (2019 GWMR)(TRC, January 2020) that still apply.

3.3 Verification Resampling for the First 2021 Semiannual Event

Verification resampling is performed per the Stats Plan and the *USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance, USEPA, 2009) to achieve performance standards as specified by §257.93(g) in the CCR Rule. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Only constituents that initially exceed their statistical limit (i.e., have no previously recorded SSIs) will be analyzed for verification purposes.

Verification resampling for the May 2021 event was conducted from June 25th through 28th, 2021 by TRC personnel. A groundwater sample was collected for TDS at MW-16-04 and sulfate at MW-16-05 in accordance with the QAPP. A summary of the analytical results collected during the June 2021 resampling event is provided on Table 3. The verification results for sulfate at MW-16-05 were below the prediction limit, therefore the SSI for sulfate was not confirmed and no SSI will be recorded for sulfate at MW-16-05 during the first semiannual 2021 sampling event. The associated data quality review is included in Appendix C.

The verification result for TDS at MW-16-04 confirmed the SSI from the May 2021 sampling event. TRC reviewed the data and determined that TDS is a result of natural variability in groundwater quality and not attributable to the RRLF CCR unit as presented in the *Alternate Source Demonstration: Second Quarter 2021 Semiannual Detection Monitoring Sampling Event Range Road Landfill Coal Combustion Residual Unit 3600 Range Road, China Township, Michigan* dated August 16, 2021 (August 2021 ASD) (Appendix A). As such, detection monitoring was continued in accordance with §257.94 of the CCR Rule.

3.4 Data Comparison to Background Limits – Second 2021 Semiannual Event (October 2021)

The data comparisons for the October 2021 groundwater monitoring event are presented on Table 4. The statistical evaluation of the October 2021 Appendix III indicator parameters showed a potential initial SSI over background for:

- TDS at MW-16-06.

The calcium and sulfate concentrations at MW-16-06, during the Second 2021 Semiannual Event have been previously demonstrated to be from natural variability and are not from the CCR unit as presented in the ASDs that still apply that were included in the 2018 GWMR and 2019 GWMR.

3.5 Verification Resampling for the Second 2021 Semiannual Event

Verification resampling is performed per the Stats Plan and the *USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance, USEPA, 2009) to achieve performance standards as specified by §257.93(g) in the CCR Rule. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Only constituents that initially exceed their statistical limit (i.e., have no previously recorded SSIs) will be analyzed for verification purposes.

Verification resampling for the October 2021 event was conducted on December 6th, 2021 by TRC personnel. A groundwater sample was collected for TDS from MW-16-06 in accordance with the QAPP. A summary of the analytical results collected during the December 2021 resampling event is provided on Table 4. The associated data quality review is included in Appendix C. The verification result for TDS at MW-16-06 confirmed the SSI from the October 2021 sampling event. Per §257.94(e), DTE Electric is in the process of performing an ASD to further evaluate the TDS SSI at MW-16-06.

4.0 Conclusions and Recommendations

A potential SSI over the background limit for TDS at MW-16-04 was noted during the May 2021 monitoring event. The observed concentration of TDS at MW-16-04 was demonstrated to be a result of natural variability in groundwater quality and not attributable to the RRLF CCR unit, as documented in the ASD (Appendix A). As discussed above, and in the GWMS Report, with the presence of the vertically and horizontally extensive clay-rich confining till beneath the RRLF CCR unit, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from operations. For the October 2021 monitoring event, an SSI for TDS was observed at MW-16-06, as verified by resampling, and is being further evaluated through the ASD process.

According to §257.94(e), in the event that the facility determines, pursuant to §257.93(h), that there is a SSI over background levels for one or more of the Appendix III constituents, the facility will, within 90 days of detecting an SSI, establish an assessment monitoring program <or> demonstrate that:

- A source other than the CCR unit caused the SSI, or
- The SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

The owner or operator must complete a written demonstration (i.e., Alternative Source Demonstration, ASD), of the above within 90 days of confirming the SSI. Based on the outcome of the ASD the following steps will be taken:

- If a successful ASD is completed, a certification from a qualified professional engineer is required, and the CCR unit may continue with detection monitoring.

If a successful ASD is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under §257.95. The facility must also include the ASD in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer.

In response to the TDS SSI over the background limit noted during the October 2021 event, DTE plans to prepare an ASD to evaluate whether a source other than the RRLF CCR unit caused the SSI.

No corrective actions were performed in 2021. The next semiannual monitoring event at the RRLF CCR unit is scheduled for the second calendar quarter of 2022.

5.0 Groundwater Monitoring Report Certification

The U.S. EPA's Disposal of Coal Combustion Residuals from Electric Utilities Final Rule Title 40 CFR Part 257 §257.90(e) requires that the owner or operator of an existing CCR unit prepare an annual groundwater monitoring and corrective action report.

Annual Groundwater Monitoring Report Certification
Range Road Landfill
China Township, Michigan

CERTIFICATION

I hereby certify that the annual groundwater and corrective action report presented within this document for the RRLF CCR unit has been prepared to meet the requirements of Title 40 CFR §257.90(e) of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.90(e).

Name: David B. McKenzie, P.E.	Expiration Date: December 17, 2023	 Stamp January 31, 2022
Company: TRC Engineers Michigan, Inc.	Date: January 31, 2022	

6.0 References

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USEPA. April 2018. Barnes Johnson (Office of Resource Conservation and Recovery) to James Roewer (c/o Edison Electric Institute) and Douglas Green, Margaret Fawal (Venable LLP). Re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements. April 30, 2018. United States Environmental Protection Agency, Washington, D.C. 20460. Office of Solid Waste and Emergency Response, now the Office of Land and Emergency Management.

Tables

Table 1
Summary of Groundwater Elevation Data – May and October 2021
Range Road Landfill – RCRA CCR Monitoring Program
China Township, Michigan

Well ID	MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-05		MW-16-06		MW-16-07	
Date Installed	1/13/2016		1/27/2016		2/1/2016		5/24/2016		5/13/2016		5/10/2016		5/13/2016	
TOC Elevation	595.35		598.44		597.69		596.87		601.97		600.68		589.34	
Geologic Unit of Screened interval	Sand with Silt		Silty Sand with Gravel		Silty Gravel with Sand		Silty Sand		Gravel with Sand		Sand		Sand	
Screened Interval Elevation	390.7 to 385.7		393.8 to 388.8		432.1 to 427.1		414.1 to 409.1		476.6 to 471.6		508.0 to 503.0		494.4 to 489.4	
Unit	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft
Measurement Date	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation
05/17/2021	18.33	577.02	20.71	577.73	19.94	577.75	19.22	577.65	27.43	574.54	23.62	577.06	16.97	572.37
10/18/2021	18.17	577.18	20.58	577.86	19.85	577.84	19.10	577.77	27.42	574.55	23.52	577.16	15.75	573.59

Notes:

Elevations are reported in feet relative to the North American Vertical Datum of 1988.

ft BTOC - feet below top of casing.

Table 2
Summary of Field Data – May to December 2021
Range Road Landfill – RCRA CCR Monitoring Program
China Township, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (deg C)	Turbidity (NTU)
MW-16-01	5/17/2021	1.56	18.9	7.2	1,528	11.30	3.34
	10/18/2021	1.04	-168.0	7.6	1,702	11.40	1.63
MW-16-02	5/17/2021	1.58	-150.0	8.2	1,459	11.00	4.21
	10/18/2021	0.96	-231.2	8.2	1,664	12.20	2.27
MW-16-03	5/17/2021	1.55	-123.6	8.0	1,287	11.30	2.86
	10/18/2021	0.95	-189.5	8.0	1,413	12.30	2.81
MW-16-04	5/19/2021	1.71	-72.5	7.5	5,879	11.30	7.42
	6/25/2021	2.39	-162.4	7.9	9,320	12.50	12.4
	10/19/2021	1.08	-197.8	7.8	6,810	11.50	19.7
MW-16-05	5/18/2021	1.56	-92.4	8.3	1,463	11.30	1.63
	6/28/2021	2.04	-173.4	8.0	2,072	13.60	7.25
	10/18/2021	0.95	-204.6	8.2	1,469	11.70	1.06
MW-16-06	5/17/2021	1.61	-63.2	7.6	1,271	11.40	4.38
	10/18/2021	1.04	-170.7	7.6	1,499	11.70	1.38
	12/6/2021	1.03	-128.1	7.8	1,608	10.40	1.20
MW-16-07	5/18/2021	1.53	-123.5	7.9	947	11.30	42.6
	10/19/2021	1.06	-166.0	7.7	960	10.90	66.7

Notes:

mg/L -Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celcius.

NTU - Nephelmetric Turbidity Unit.

Table 3
Comparison of Appendix III Parameter Results to Background Limits – May and June 2021
Range Road Landfill – RCRA CCR Monitoring Program
China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04			MW-16-05			MW-16-06		MW-16-07	
Sample Date:		5/17/2021	PL	5/17/2021	PL	5/17/2021	PL	5/19/2021	6/25/2021	PL	5/18/2021	6/28/2021	PL	5/17/2021	PL	5/18/2021	PL
Constituent	Unit	Data		Data		Data		Data			Data			Data		Data	
Appendix III																	
Boron	ug/L	510	560	1,000	1,100	1,100	1,200	980	--	1,100	1,200	--	1,400	970	1,200	850	950
Calcium	ug/L	79,000	89,000	22,000	24,000	20,000	21,000	66,000	--	67,000	19,000	--	19,000	**35,000**[(1)]	31,000	45,000	66,000
Chloride	mg/L	700	770	650	720	520	550	3,200	--	3,600	560	--	620	500	590	**350**[(2)]	330
Fluoride	mg/L	0.84	0.95	2.1	2.1	2.2	2.3	1.5	--	1.6	1.9	--	1.9	1.5	1.6	1.3	1.3
pH, Field	SU	7.2	7.1 - 8.4	8.2	8.2 - 9.0	8.0	8.0 - 8.8	7.5	7.9	7.5 - 8.5	8.3	8.0	8.0 - 8.9	7.6	7.6 - 8.4	7.9	7.2 - 8.3
Sulfate	mg/L	31	43	< 10	10	< 10	10	< 5.0	--	50	**15**	7.5	10	**60**[(3)]	31	3.4	120
Total Dissolved Solids	mg/L	1,200	1,300	1,100	1,200	970	1,200	**5,600**	**5,400**[(4)]	5,300	970	--	1,200	1,000	1,100	710	770

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

-- = not analyzed

All metals were analyzed as total unless otherwise specified.

Bold font indicates an exceedance of the Prediction Limit (PL).

RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

(1) - Concentration addressed through First 2019 Semiannual alternative source demonstration.

(2) - Concentration addressed through initial alternative source demonstration.

(3) - Concentration addressed through First 2018 semiannual alternative source demonstration.

(4) - Concentration addressed through Second Quarter 2021 alternative source demonstration.

Table 4
Comparison of Appendix III Parameter Results to Background Limits – October and December 2021
Range Road Landfill – RCRA CCR Monitoring Program
China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-05		MW-16-06			MW-16-07	
Sample Date:		10/18/2021	PL[1]	10/18/2021	PL[1]	10/18/2021	PL[1]	10/18/2021	PL[1]	10/18/2021	PL[1]	10/18/2021	12/6/2021	PL[1]	10/18/2021	PL[1]
Constituent	Unit	Data		Data		Data		Data		Data		Data			Data	
Appendix III																
Boron	ug/L	510	620	920	1,200	1,100	1,300	880	1,200	1,200	1,400	900	--	1,200	880	980
Calcium	ug/L	77,000	87,000	21,000	24,000	19,000	28,000	63,000	68,000	17,000	19,000	**46,000[2]**	--	34,000	45,000	59,000
Chloride	mg/L	550	770	660	720	520	580	3,200	3,600	560	630	490	--	580	350	380
Fluoride	mg/L	0.85	0.90	2.0	2.1	2.2	2.2	1.5	1.69	2.0	2.0	1.4	--	1.5	1.3	1.3
pH, Field	SU	7.6	7.1 - 8.2	8.2	8.2 - 9.0	8.0	8.0 - 8.8	7.8	7.6 - 8.6	8.2	8.0 - 8.9	7.6	7.8	7.6 - 8.3	7.7	7.3 - 8.4
Sulfate	mg/L	41	45	1.7	10	< 5.0	10	< 5.0	50	3.0	10	**150[3]**	--	54	3.8	74
Total Dissolved Solids	mg/L	1,200	1,300	1,100	1,300	1,000	1,100	5,100	5,300	1,100	1,200	**1,200**	**1,300**	1,100	670	760

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

-- = not analyzed

All metals were analyzed as total unless otherwise specified.

Bold font indicates an exceedance of the Prediction Limit (PL).

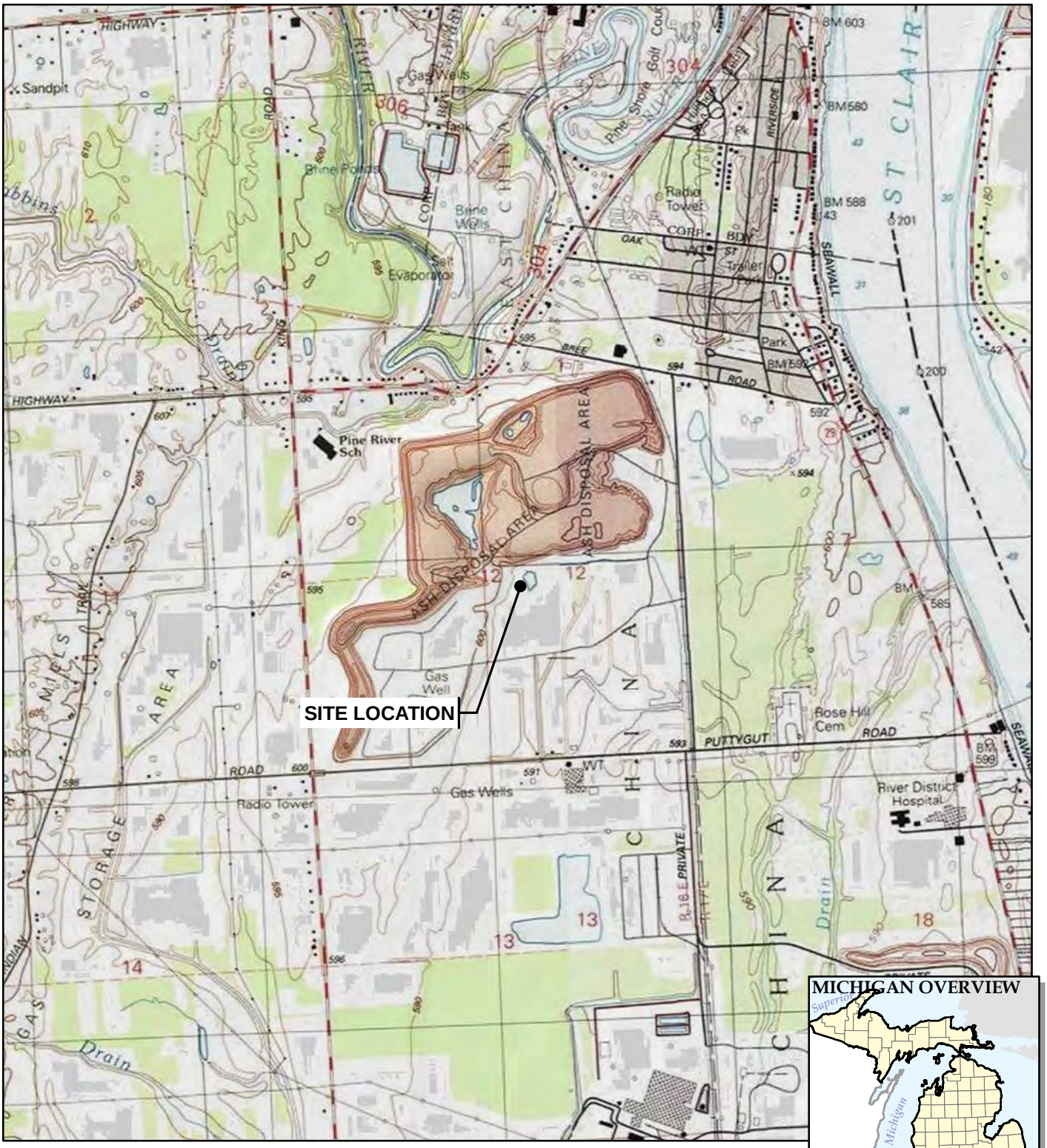
RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

(1) - Prediction limits updated December 15, 2021.

(2) - Concentration addressed through First 2019 Semiannual alternative source demonstration.

(3) - Concentration addressed through First 2018 Semiannual alternative source demonstration.

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 2,000 4,000
FEET

TRC

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TRC - GIS

PROJECT:

DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

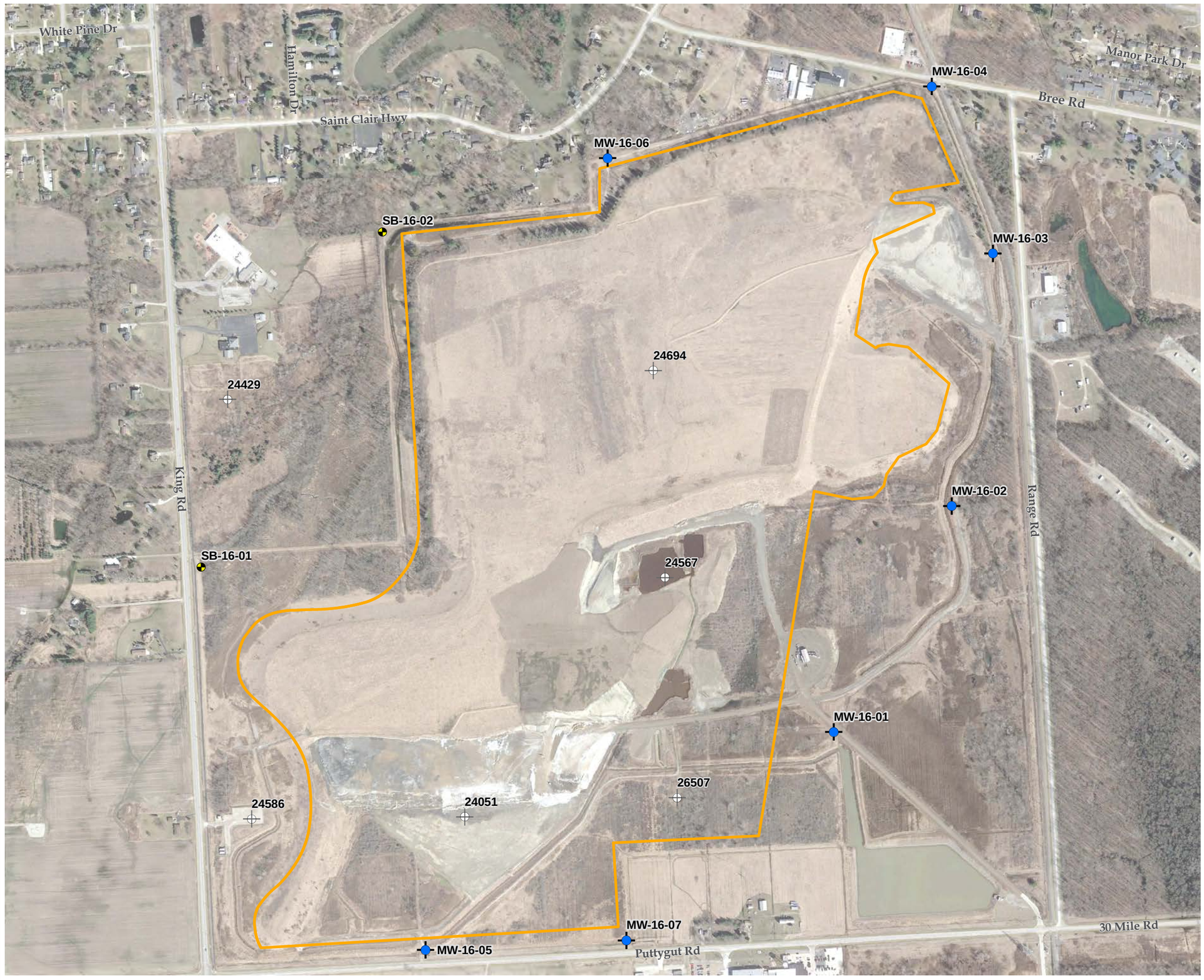
TITLE:

SITE LOCATION MAP

DRAWN BY:	A. FOJTIK
CHECKED BY:	J. KRENZ
APPROVED BY:	V. BUENING
DATE:	JANUARY 2022
PROJ. NO.:	413591.0000
FILE:	413591-0000-001SLM.mxd

FIGURE 1

S:\1-PROJECTS\DTE_Energy\320511_RiverRouge\370029-0000-001SLM.mxd -- Saved By: SMAJOR on 1/27/2021, 10:23:11 AM



LEGEND

- MONITORING WELL
- SOIL BORING
- APPROXIMATE ANTICIPATED MAXIMUM LIMIT OF ASH FILL
- OIL/GAS WELL LOCATION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO,2019.
2. WELL LOCATIONS SURVEYED IN MARCH AND MAY 2016 BY BMJ ENGINEERS & SURVEYORS, INC.
3. OIL AND GAS WELL LOCATIONS FROM MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, GEOWEBFACE.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

TITLE:
MONITORING NETWORK AND SITE PLAN

DRAWN BY:	A. FOJTIK	PROJ NO.:	413591.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 2**
DATE:	JANUARY 2022		

1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com

FILE NO.: 413591-0000-002.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
Plot Date: 1/27/2021, 10:34:49 AM by SMAJOR -- LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\370029-0000-002.mxd

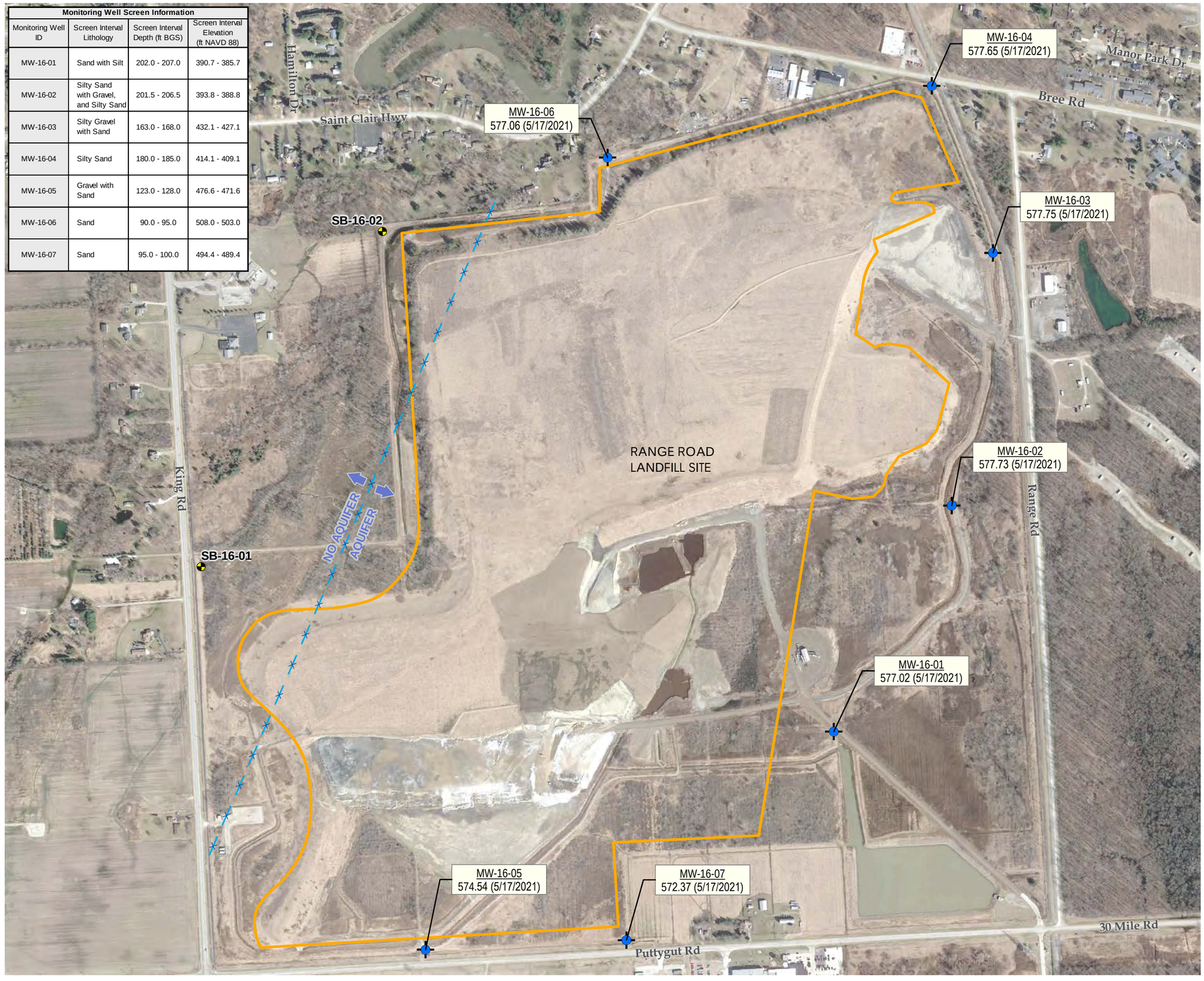
TRC - GIS

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

Plot Date: 1/19/2021, 09:44:15 AM by SMAJOR - - LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\370029-0000-003.mxd

Monitoring Well Screen Information

Monitoring Well ID	Screen Interval Lithology	Screen Interval Depth (ft BGS)	Screen Interval Elevation (ft NAVD 88)
MW-16-01	Sand with Silt	202.0 - 207.0	390.7 - 385.7
MW-16-02	Silty Sand with Gravel, and Silty Sand	201.5 - 206.5	393.8 - 388.8
MW-16-03	Silty Gravel with Sand	163.0 - 168.0	432.1 - 427.1
MW-16-04	Silty Sand	180.0 - 185.0	414.1 - 409.1
MW-16-05	Gravel with Sand	123.0 - 128.0	476.6 - 471.6
MW-16-06	Sand	90.0 - 95.0	508.0 - 503.0
MW-16-07	Sand	95.0 - 100.0	494.4 - 489.4



LEGEND

- MONITORING WELL
- SOIL BORING
- APPROXIMATE ANTICIPATED MAXIMUM LIMIT OF ASH FILL
- APPROXIMATE AQUIFER BOUNDARY

MW ID
GROUNDWATER ELEVATION (DATE)

FT BGS
FEET BELOW GROUND SURFACE
FT NAVD 88
FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2019.
2. WELL LOCATIONS SURVEYED IN MARCH AND MAY 2016 BY BMJ ENGINEERS & SURVEYORS, INC .

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

TITLE:
UPPERMOST USEABLE AQUIFER GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY MAY 2021

DRAWN BY:	A. FOJTIK	PROJ NO.:	413591.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	JANUARY 2022		

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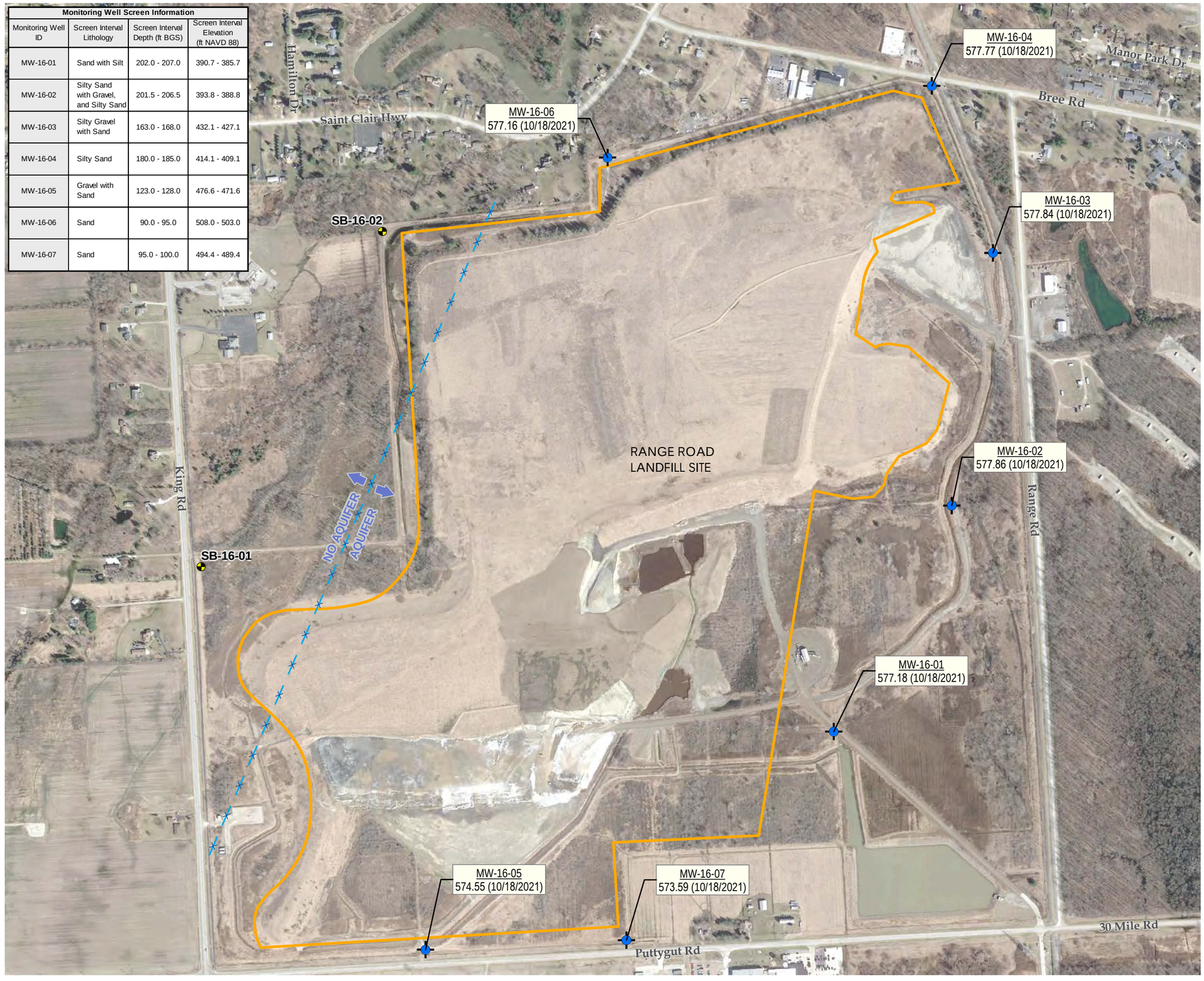
FILE NO.: 370029-0000-003.mxd

Monitoring Well Screen Information

Monitoring Well ID	Screen Interval Lithology	Screen Interval Depth (ft BGS)	Screen Interval Elevation (ft NAVD 88)
MW-16-01	Sand with Silt	202.0 - 207.0	390.7 - 385.7
MW-16-02	Silty Sand with Gravel, and Silty Sand	201.5 - 206.5	393.8 - 388.8
MW-16-03	Silty Gravel with Sand	163.0 - 168.0	432.1 - 427.1
MW-16-04	Silty Sand	180.0 - 185.0	414.1 - 409.1
MW-16-05	Gravel with Sand	123.0 - 128.0	476.6 - 471.6
MW-16-06	Sand	90.0 - 95.0	508.0 - 503.0
MW-16-07	Sand	95.0 - 100.0	494.4 - 489.4



LEGEND

- MONITORING WELL
- SOIL BORING
- APPROXIMATE ANTICIPATED MAXIMUM LIMIT OF ASH FILL
- APPROXIMATE AQUIFER BOUNDARY

MW ID
GROUNDWATER ELEVATION (DATE)

FT BGS
FEET BELOW GROUND SURFACE
FT NAVD 88
FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2019.
2. WELL LOCATIONS SURVEYED IN MARCH AND MAY 2016 BY BMJ ENGINEERS & SURVEYORS, INC .

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY OCTOBER 2021

DRAWN BY:	A. FOJTIK	PROJ NO.:	413591.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	JANUARY 2022		

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Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com

FILE NO.: 413591-0000-005.mxd

Plot Date: 1/27/2021, 11:00:09 AM by SMAJOR -- LAYOUT: ANSI B(11"x17")
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Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

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Appendix A
Alternate Source Demonstration: Second Quarter 2021 Semiannual Detection Monitoring Sampling Event

1540 Eisenhower Pl.
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August 16, 2021

Mary R. Carnagie
Solid Waste Geologist
Materials Management Division
Michigan Department of Environment, Great Lakes, and Energy (EGLE)
27700 Donald Court
Warren, MI 48092-2793

Subject: Alternate Source Demonstration: Second Quarter 2021 Semiannual Detection Monitoring Sampling Event
Range Road Landfill Coal Combustion Residual Unit
3600 Range Road, China Township, Michigan

Dear Ms. Carnagie:

TRC was retained by DTE Electric Company (DTE Electric) to conduct routine groundwater monitoring activities for the uppermost usable aquifer at the Range Road Landfill (RRLF) coal combustion residual (CCR) unit, located in St Clair County, Michigan. Routine groundwater monitoring at the RRLF CCR unit is conducted in accordance with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) approved *Hydrogeologic Monitoring Plan for the DTE Electric Company Range Road Ash Disposal Facility, China Township, St. Clair County, Michigan* (2020 HMP) (TRC, November 2019; Revised May 2020) and the United States Environmental Protection Agency (USEPA) final rule for the regulation and management of CCR under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended (USEPA, April 2015).

As discussed in the *Second Quarter 2021 Hydrogeological Monitoring and Performance Monitoring Report* (Second Quarter 2021 Report) (TRC, July 2021), the statistical evaluation of the May 2021 detection monitoring indicator parameters showed potential statistically significant increases (SSIs) over the prediction limit (PL) for sulfate at MW-16-05 (15 milligrams per liter (mg/L) with a PL of 10 mg/L) and total dissolved solids (TDS) at MW-16-04 (5,600 mg/L with a PL of 5,300 mg/L). Verification resampling for the May 2021 event was conducted on June 25 and 28, 2021 by TRC personnel. The verification result for sulfate at MW-16-05 (7.5 mg/L) was below the PL (10 mg/L), consequently the initial potential SSI for sulfate at MW-16-05 is not confirmed. Therefore, in accordance with the *Uppermost Aquifer Groundwater Statistical Evaluation Plan* (Stats Plan) (TRC, October 2017, revised April 2020b) and the *USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), the initial exceedance is not statistically significant, and no SSI will be recorded for sulfate at MW-16-05. The June 2021 verification result for TDS at MW-16-04 (5,400 mg/L) is slightly above the prediction limit (5,300 mg/L), confirming the initial potential SSI from the May 2021 sampling (Table 1).

In accordance with §257.94(e)(2) and the 2020 HMP, DTE Electric may demonstrate that a source other than the CCR unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. This Alternate Source Demonstration (ASD) has been prepared to address the potential SSI identified in the May 2021 detection monitoring event.

Background

The RRLF is located in Section 12, Township 4 North, Range 16 East, 3600 Range Road, China Township in St. Clair County, Michigan. The site location is shown in Figure 1. The property has been used continuously as a coal ash landfill since Detroit Edison Company (now DTE Electric) began coal ash landfilling operations in the 1950s. The property consists of approximately 514 acres of which approximately 402 acres are designated for CCR landfill development, half of which is currently occupied with CCR.

The RRLF CCR unit is immediately underlain by 86 to 188 feet of laterally extensive, low hydraulic conductivity silty clay-rich deposits. A no flow boundary is formed across the western portion of the RRLF by clay-rich till which is present continuously to the top of bedrock in this area. Beneath the clay rich aquitard, a sand/gravel layer is encountered, which contains the uppermost aquifer present beneath the RRLF. This uppermost usable aquifer is encountered at different elevations beneath the RRLF between 86 and 196 feet below ground surface (ft bgs). As a result of site specific geologic and hydrogeologic conditions, downward migration of CCR leachate is not expected, and it is not appropriate to infer horizontal flow directions across the site. Please refer to the *Uppermost Usable Aquifer Groundwater Monitoring System Summary Report – DTE Electric Company Range Road Coal Combustion Residual Landfill, 3600 Range Road, China Township, Michigan* (October 2017, Revised April 2020a) (Uppermost Usable Aquifer Groundwater Monitoring System Summary Report) (Appendix A of the 2020 HMP) for further details regarding site-specific hydrogeology.

The uppermost usable aquifer monitoring well network for the RRLF currently consists of seven monitoring wells that are screened in the uppermost usable aquifer and are all considered to be downgradient monitoring wells. The monitoring well locations are shown in Figure 2. The Uppermost Usable Aquifer Groundwater Monitoring System Summary Report (October 2017, Revised April 2020a) (Appendix A of the 2020 HMP) details the groundwater monitoring system.

Alternate Source Demonstration

As discussed above, verification resampling was performed as recommended per the Stats Plan and the Unified Guidance to achieve performance standards as specified by §257.93(g) in the CCR Rule and the 2020 HMP. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Only constituents that initially exceeded their statistical limit (i.e., have no previously recorded SSIs) were analyzed for verification purposes. As such, verification resampling was conducted on June 25 and 28, 2021 by TRC personnel for monitoring wells MW-16-04 and MW-16-05. Groundwater samples were collected in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Range Road Coal Combustion Residual Landfill, 3600 Range Road, China Township, Michigan* (July 2016, Revised March and August 2017) and the 2020 HMP. A summary of the groundwater data collected during the verification resampling event is provided on Table 1.

The verification resampling confirmed the slight TDS exceedance at MW-16-04 (5,400 mg/L with a PL of 5,300 mg/L) and did not confirm the sulfate PL exceedance at MW-16-05 (7.5 mg/L with a PL of 10 mg/L). The following discussion presents the ASD for the confirmed prediction limit exceedances for TDS at MW-16-04.

TDS at MW-16-04: The SSI of TDS at MW-16-04, shown graphically as data points greater than the prediction limit in Figure 3, is the result of natural variability in groundwater quality at the site and not the result of a release from the RRLF CCR unit. Multiple lines of evidence are provided in support of this conclusion and are as follows:

- **Laboratory precision and accuracy in TDS analysis** – The laboratory-reported TDS concentrations for the MW-16-04 groundwater samples collected during the first semiannual 2021 sampling event (May 2021 original sample and the June 2021 confirmation sample) are slightly higher than the PL. However, the precision and accuracy range for TDS is +/- 20%. As such, the PL for each of these samples is within the margin of error of the laboratory results.
- **Insufficient background sampling timeline to account for long-term trends** – Temporal variability in TDS concentrations observed in the groundwater at RRLF during the background sampling events provides evidence of the heterogeneity of this constituent in groundwater (Figure 3). The short duration of the background sampling events limits the ability of the statistical analysis to capture the natural temporal trends in the groundwater quality at the RRLF. In addition, the May (5,600 mg/L) and June (5,400 mg/L) 2021 groundwater samples had TDS detected at concentrations that were only slightly above the MW-16-04 PL of 5,300 mg/L.
- **Lack of similar increase in other indicator parameters** – The lack of SSIs for any other parameters within the same monitoring well and across the other wells within the monitoring well network during this event also supports a source other than CCR for the observed TDS SSI at MW-16-04.
- **Time of travel analysis** – The clay formation immediately beneath the RRLF CCR unit provides a natural geologic barrier to migration of CCR constituents to the underlying aquifer. The vertical extent of the clay layer beneath the CCR unit is shown in Figures 5 through 7 as cross-sections. Figure 4 shows the cross-section locations in plan view. Conservatively calculating a time of travel for liquid from the base of the RRLF through a minimum of 86 feet of clay to the underlying upper aquifer yields over 1,300 years of travel time (TRC, October 2017; Revised April 2020a). The RRLF began accepting coal ash in approximately 1950, therefore, based on this analysis, there is no potential for indicator parameters to have migrated to the uppermost usable aquifer.

Conclusions and Recommendations

The information provided in this report serves as the ASD for the DTE Electric RRLF, was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and the 2020 HMP and demonstrates that the TDS SSI determined based on the May 2021 detection monitoring event is not due to a release of CCR leachate into the groundwater. Therefore, based on the information provided in this ASD, DTE Electric will continue detection monitoring as per 40 CFR 257.94 at the RRLF CCR unit.

Signatures and Certifications

Engineer Certification Statement

I hereby certify that the alternative source demonstration presented within this document for the RRLF CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule and the May 2020 *Hydrogeological Monitoring Plan for the DTE Electric Company Range Road Ash Disposal Facility* (2020 HMP). This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2 and the 2020 HMP.

Name: David B. McKenzie, P.E.	Expiration Date: October 31, 2021	STATE OF MICHIGAN DAVID B MCKENZIE ENGINEER No. 6201042332 LICENSED PROFESSIONAL ENGINEER Stamp
Company: TRC Engineers Michigan, Inc.	Date: August 16, 2021	

In addition, the signature below certifies that this letter report was prepared under the direction of a qualified groundwater scientist in accordance with the EGLE-approved HMP and the Stats Plan. A copy of this report will be placed in the facility file.

Sincerely,

TRC

Vincent E. Buening, C.P.G
Sr. Project Manager

Sarah B. Holmstrom, P.G
Senior Hydrogeologist

Attachments

Table 1	Comparison of Appendix III and Part 115 Groundwater Parameter Results to Background Limits – Second Quarter 2021
Figure 1	Site Location Map
Figure 2	Uppermost Usable Aquifer Monitoring Well Network and Site Plan
Figure 3	Total Dissolved Solids at MW-16-04
Figure 4	Cross Section Locator Map
Figure 5	Generalized Geologic Cross Section A-A'
Figure 6	Generalized Geologic Cross Section B-B'
Figure 7	Generalized Geologic Cross Section C-C'

Appendix A References

cc: Christopher P. Scieszka, DTE Electric Company

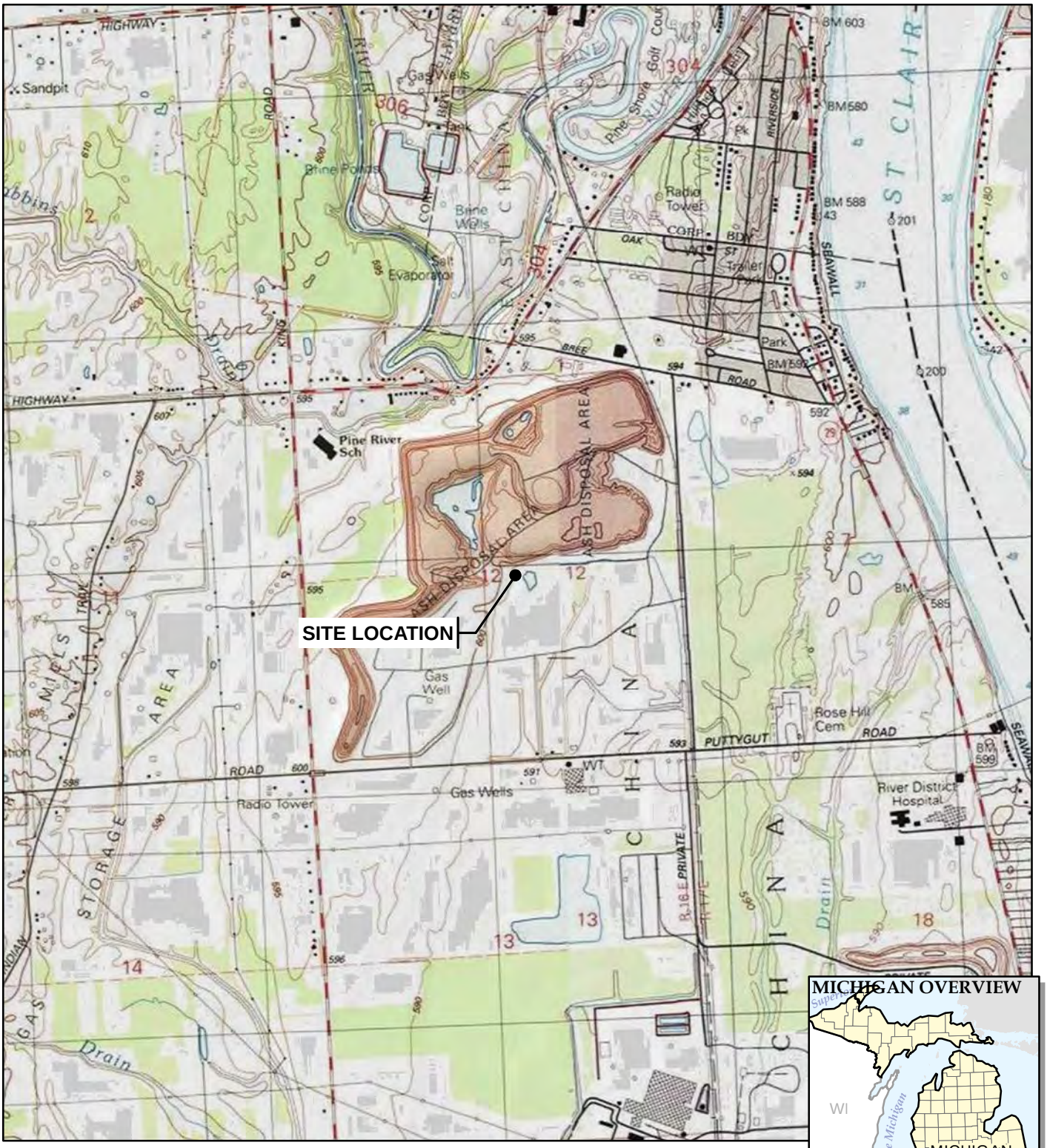
Table

Table 1
Comparison of Appendix III and Part 115 Groundwater Parameter Results to Background Limits – Second Quarter 2021
Uppermost Usable Aquifer
DTE Electric Company - Range Road Landfill

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04			MW-16-05			MW-16-06		MW-16-07	
Sample Date:		5/17/2021	PL	5/17/2021	PL	5/17/2021	PL	5/19/2021	6/25/2021	PL	5/18/2021	6/28/2021	PL	5/17/2021	PL	5/18/2021	PL
Constituent	Unit	Data		Data		Data		Data			Data			Data		Data	
Conductivity (Field)	umhos/cm	1,528	NA	1,459	NA	1,287	NA	5,879	9,320	NA	1,463	2,072	NA	1,271	NA	947	NA
Appendix III																	
Boron	ug/L	510	560	1,000	1,100	1,100	1,200	980	--	1,100	1,200	--	1,400	970	1,200	850	950
Calcium	ug/L	79,000	89,000	22,000	24,000	20,000	21,000	66,000	--	67,000	19,000	--	19,000	**35,000**[(1)]	31,000	45,000	66,000
Chloride	mg/L	700	770	650	720	520	550	3,200	--	3,600	560	--	620	500	590	**350**[(2)]	330
Fluoride	mg/L	0.84	0.95	2.1	2.1	2.2	2.3	1.5	--	1.6	1.9	--	1.9	1.5	1.6	1.3	1.3
pH, Field	SU	7.2	7.1 - 8.4	8.2	8.2 - 9.0	8.0	8.0 - 8.8	7.5	7.9	7.5 - 8.5	8.3	8.0	8.0 - 8.9	7.6	7.6 - 8.4	7.9	7.2 - 8.3
Sulfate	mg/L	31	43	<10	10	<10	10	<5.0	--	50	**15**	7.5	10	**60**[(3)]	31	3.4	120
Total Dissolved Solids	mg/L	1,200	1,300	1,100	1,200	970	1,200	**5,600**	**5,400**	5,300	970	--	1,200	1,000	1,100	710	770
Part 115																	
Iron	ug/L	1,400	n <8	930	n <8	530	n <8	980	--	n <8	220	--	n <8	600	n <8	3,400	n <8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
umhos/cm - micromhos per centimeter.
NA - Not applicable.
n - number of data points
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).
RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).
(1) - Concentration addressed through First 2019 Semiannual alternative source demonstration dated August 2019.
(2) - Concentration addressed through initial alternative source demonstration dated April 2018.
(3) - Concentration addressed through First 2018 semiannual alternative source demonstration dated August 2018.

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 2,000 4,000
FEET

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
TRC - GIS

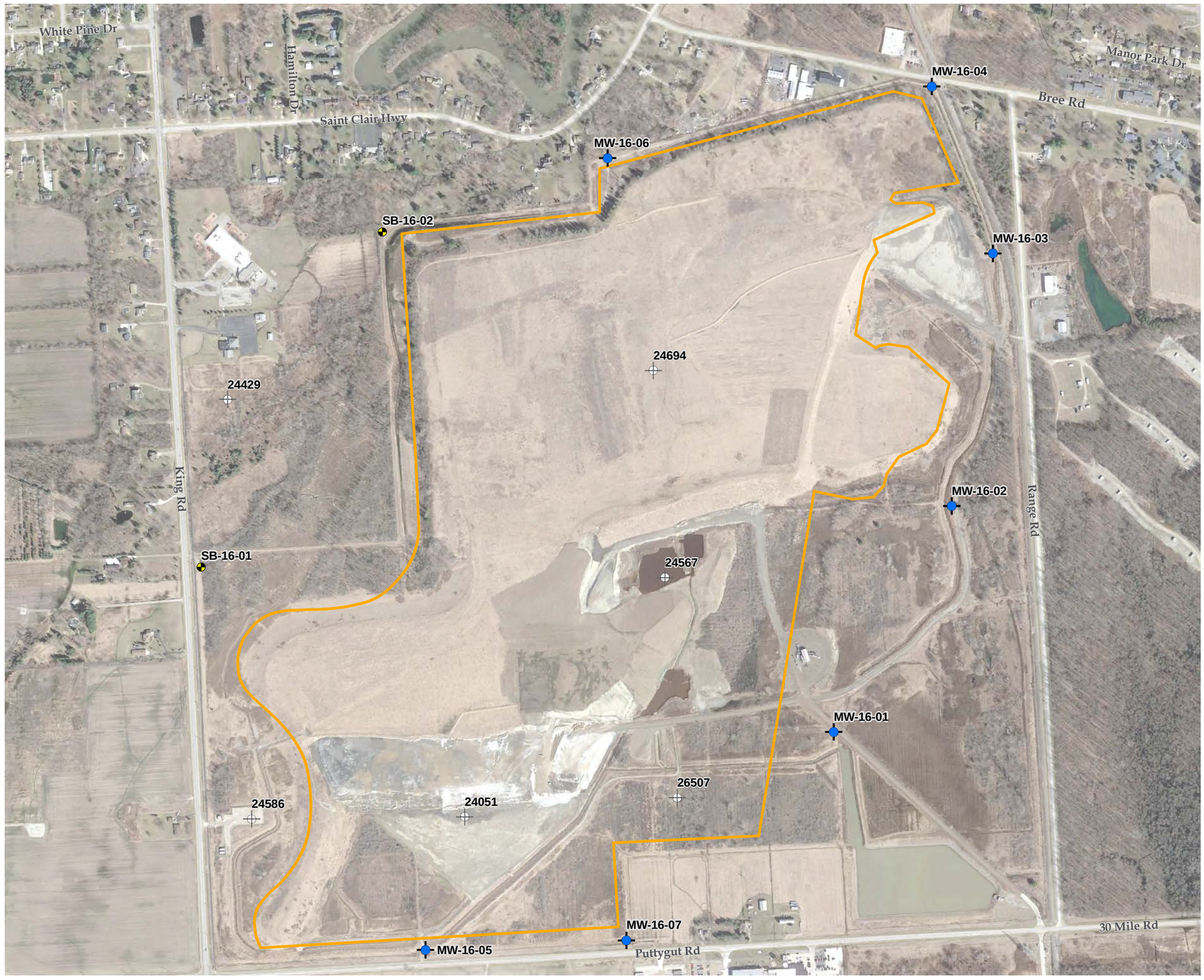
PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	S. MAJOR
CHECKED BY:	S. HOLMSTROM
APPROVED BY:	V. BUENING
DATE:	NOVEMBER 2019
PROJ. NO.:	320511.0000
FILE:	320511-0003-001slmMB.mxd

FIGURE 1

E:\DTE\CCR_Sites\2017_265996\320511-0003-001slmMB.mxd -- Saved By: SMAJOR on 11/7/2019, 10:21:30 AM



LEGEND

- MONITORING WELL
- SOIL BORING
- APPROXIMATE ANTICIPATED MAXIMUM LIMIT OF ASH FILL
- OIL/GAS WELL LOCATION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO,2019.
2. WELL LOCATIONS SURVEYED IN MARCH AND MAY 2016 BY BMJ ENGINEERS & SURVEYORS, INC.
3. OIL AND GAS WELL LOCATIONS FROM MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, GEOWEBFACE.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
3600 RANGE ROAD
CHINA TOWNSHIP, MICHIGAN

TITLE:
UPPERMOST USABLE AQUIFER MONITORING WELL NETWORK AND SITE PLAN

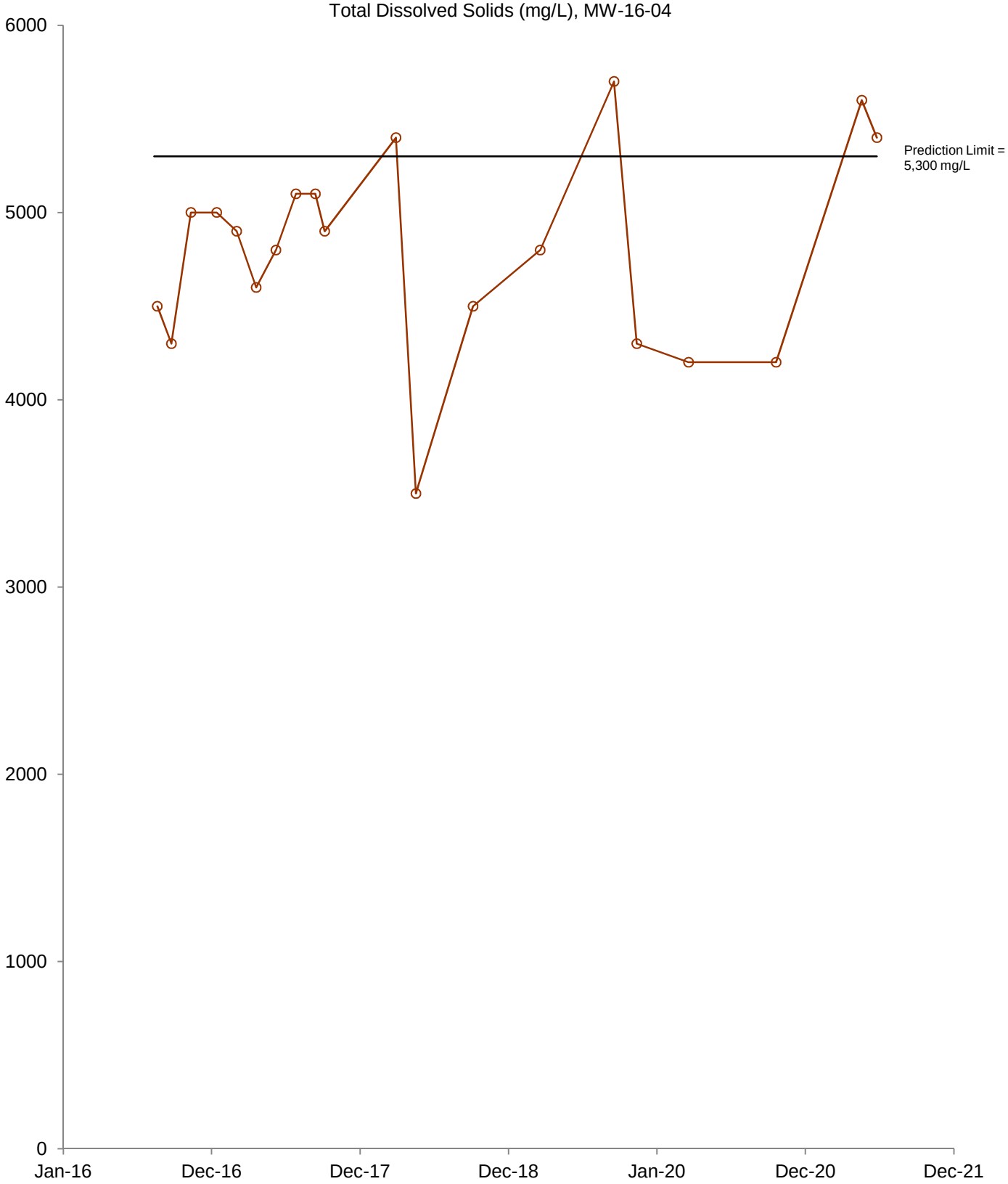
DRAWN BY:	S. MAJOR	PROJ NO.:	413591.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		FIGURE 2
DATE:	JULY 2021		

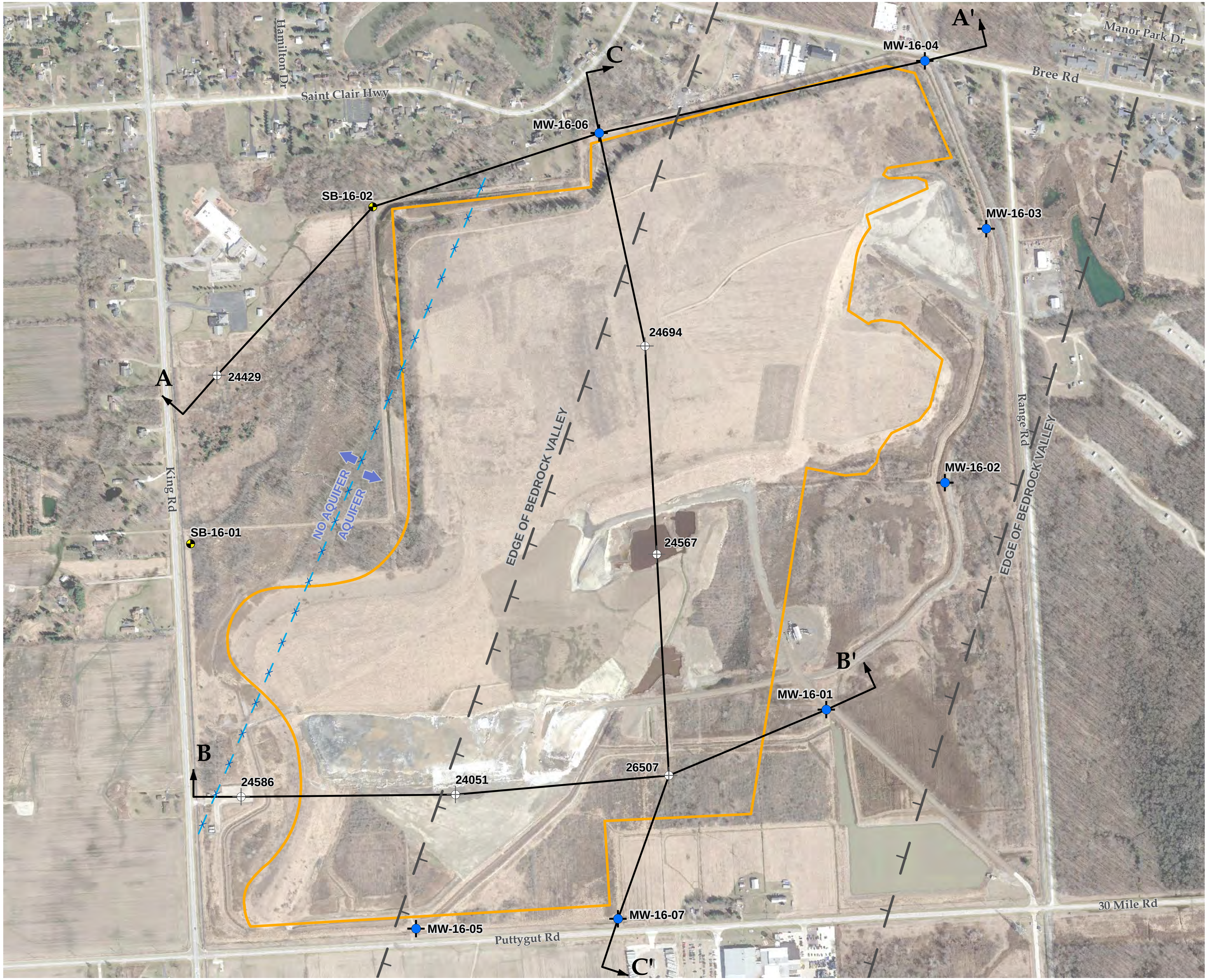
TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com

FILE NO.: 370029-0000-004.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
Plot Date: 1/19/2021, 09:37:45 AM by SMAJOR -- LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\370029-0000-004.mxd

Figure 3
Total Dissolved Solids (mg/L), MW-16-04





LEGEND

- MONITORING WELL
- SOIL BORING
- APPROXIMATE ANTICIPATED MAXIMUM LIMIT OF ASH FILL
- OIL/GAS WELL LOCATION
- CROSS SECTION LINES
- APPROXIMATE AQUIFER BOUNDARY
- APPROXIMATE EDGE OF BEDROCK VALLEY

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2019.
2. WELL LOCATIONS SURVEYED IN MARCH AND MAY 2016 BY BMJ ENGINEERS & SURVEYORS, INC.
3. OIL AND GAS WELL LOCATIONS FROM MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, GEOWEBFACE.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

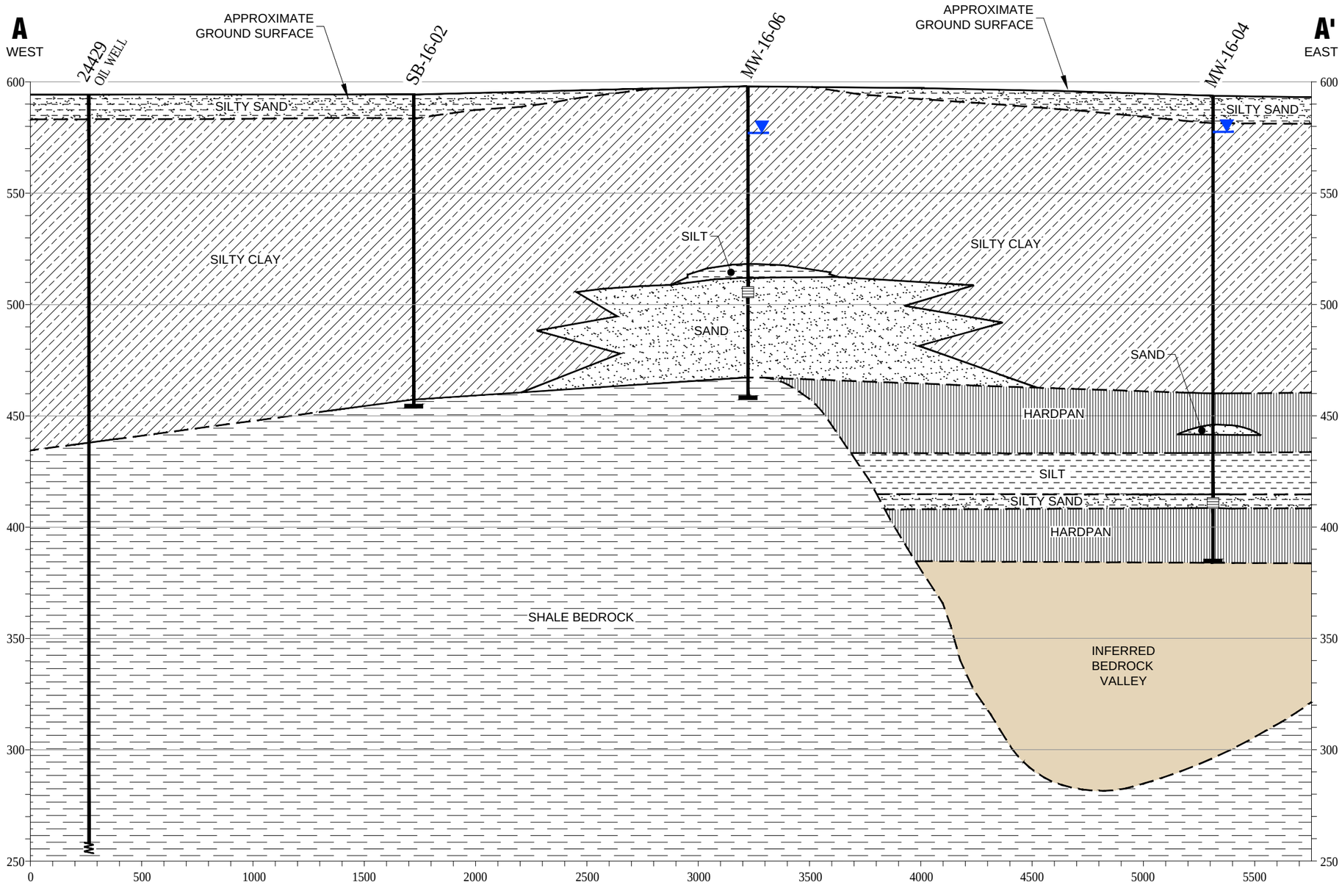
PROJECT:	DTE ELECTRIC COMPANY RANGE ROAD LANDFILL 3600 RANGE ROAD CHINA TOWNSHIP, MICHIGAN
TITLE:	CROSS SECTION LOCATOR MAP
DRAWN BY: S. MAJOR	PROJ NO.: 265996.0000
CHECKED BY: S HOLMSTROM	FIGURE 4
APPROVED BY: V BUENING	
DATE: NOVEMBER 2019	
TRC	1540 Eisenhower Place Ann Arbor, MI 48108-3284 Phone: 734.971.7080 www.trcsolutions.com
FILE NO.:	320511-0000-008.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

Plot Date: 11/13/2019, 10:27:03 AM by SMAJOR -- LAYOUT: ANSI B(11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\320511-0000-008.mxd

GENERALIZED GEOLOGIC CROSS-SECTION A-A'



LEGEND

- STRATEGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- GROUNDWATER ELEVATION
- SOIL BORING
- WELL SCREEN INTERVAL
- END OF BORING

Lithology Key

- SILT
- HARDPAN
- SILTY SAND
- SILTY CLAY
- SAND
- SHALE BEDROCK
- UNCONSOLIDATED BEDROCK VALLEY FILL

SCALE IN FEET
VERTICAL 50 0
HORIZONTAL 0 500

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
CHINA TOWNSHIP, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS-SECTION A-A'

DRAWN BY:	D.STEHLE	PROJ NO.:	265996.0000
CHECKED BY:	S.HOLMSTROM		
APPROVED BY:	V.BUENING		**FIGURE 5**
DATE:	SEPTEMBER 2017		

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Ann Arbor, MI 48108
Phone: 734.971.7080
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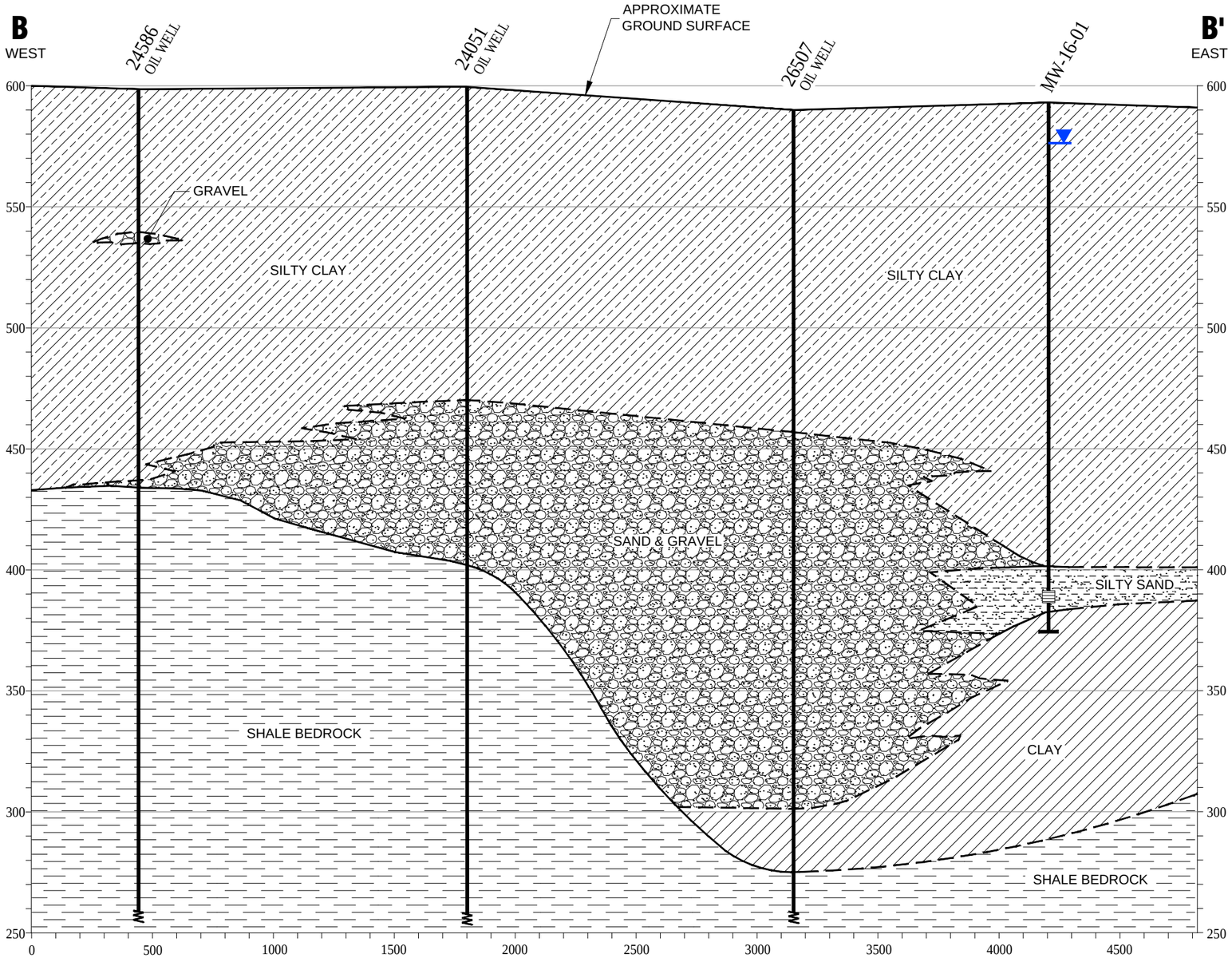
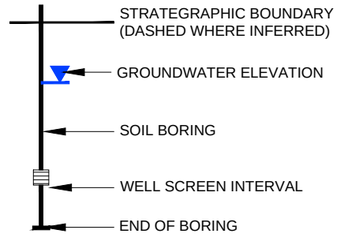
FILE NO.: 265996.0000.04-06.dwg

11x17 --- ATTACHED XREFS: --- ATTACHED IMAGES:
DRAWING NAME: J:_TRC\DTE\East China\Range Road LF\265996\0000\ 265996.0000.04-06.dwg --- PLOT DATE: November 08, 2019 - 5:55AM --- LAYOUT: FIG04 XS AA

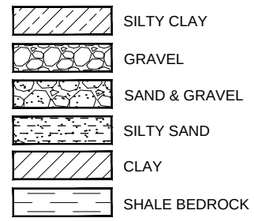
GENERALIZED GEOLOGIC CROSS-SECTION B-B'

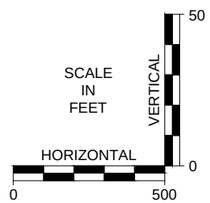


LEGEND



Lithology Key





PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
CHINA TOWNSHIP, MICHIGAN

TITLE:
GENERALIZED
GEOLOGIC CROSS-SECTION B-B'

DRAWN BY:	D.STEHLE	PROJ NO.:	265996.0000
CHECKED BY:	S.HOLMSTROM		
APPROVED BY:	V.BUENING		**FIGURE 6**
DATE:	SEPTEMBER 2017		

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Phone: 734.971.7080
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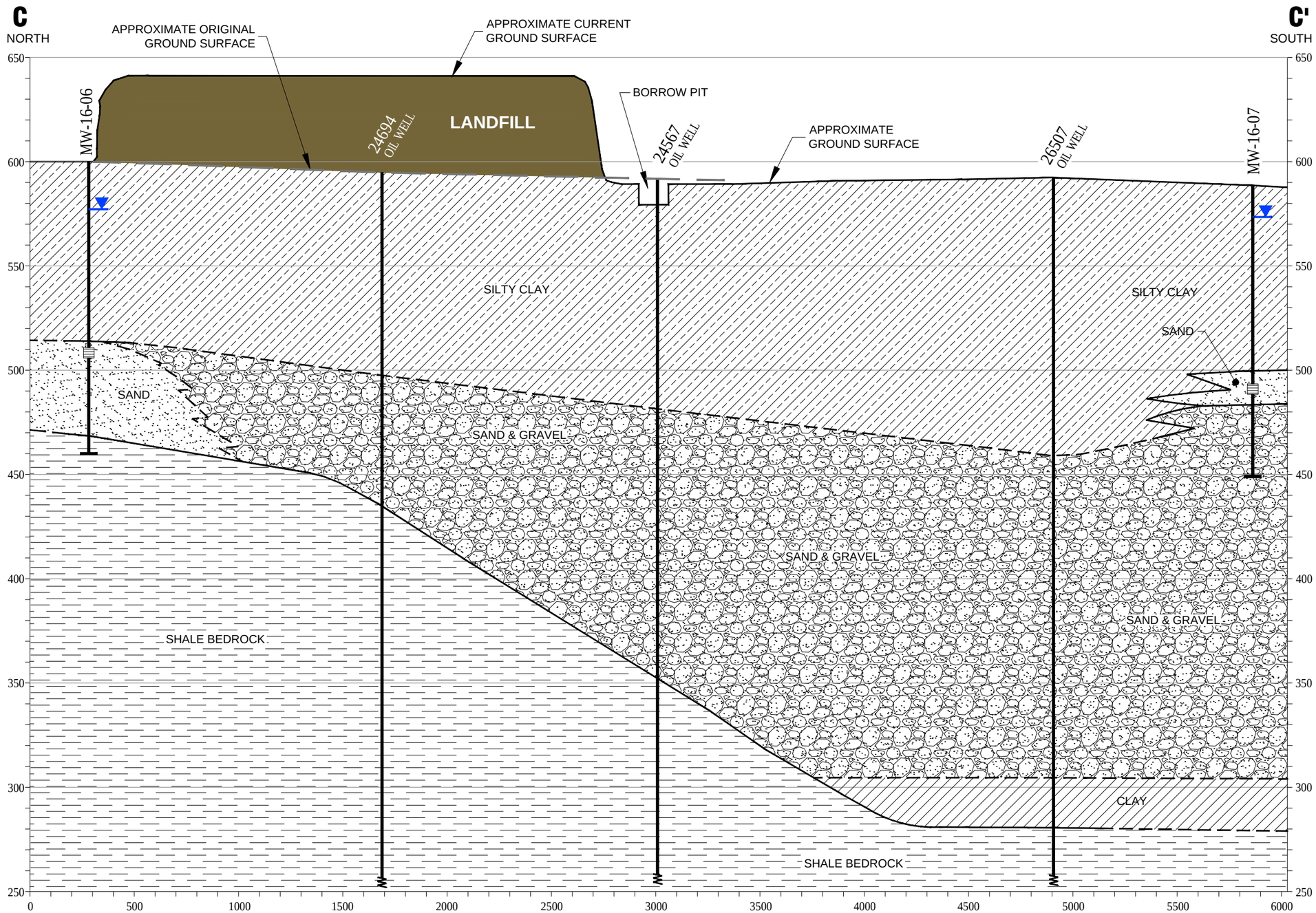
FILE NO.: 265996.0000.04-06.dwg

GENERALIZED GEOLOGIC CROSS-SECTION C-C'



LEGEND

- STRATEGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- GROUNDWATER ELEVATION
- SOIL BORING
- WELL SCREEN INTERVAL
- END OF BORING

Lithology Key

- SILTY CLAY
- SAND
- SAND & GRAVEL
- SILTY SAND
- CLAY
- SHALE BEDROCK

SCALE IN FEET
VERTICAL: 50, 0
HORIZONTAL: 0, 500

PROJECT:
DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL
CHINA TOWNSHIP, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS-SECTION C-C'

DRAWN BY:	D.STEHLE	PROJ NO.:	265996.0000
CHECKED BY:	S.HOLMSTROM		
APPROVED BY:	V.BUENING		**FIGURE 7**
DATE:	SEPTEMBER 2017		

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080
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FILE NO.: 265996.0000.04-06.dwg

11x17 --- ATTACHED XREF'S: --- ATTACHED IMAGES:
DRAWING NAME: J:_TRC\DTE\East China\Range Road LF\265996\0000\ 265996.0000.04-06.dwg --- PLOT DATE: November 08, 2019 - 5:56AM --- LAYOUT: FIG06 XS CC

Appendix A
References

References

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TRC. October 2017, Revised April 2020b. Uppermost Usable Aquifer Groundwater Statistical Evaluation Plan – DTE Electric Company Range Road Coal Combustion Residual Landfill, 3600 Range Road, China Township, Michigan. Prepared for DTE Electric Company.

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TRC. July 2021. Second Quarter 2021 Hydrogeologic Monitoring and Performance Monitoring Report, DTE Electric Company, Range Road Ash Disposal Facility, 3600 Range Road, China Township, Michigan. Prepared for DTE Electric Company.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

USEPA. April 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301).

USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).

USEPA. April 2018. Barnes Johnson (Office of Resource Conservation and Recovery) to James Roewer (c/o Edison Electric Institute) and Douglas Green, Margaret Fawal (Venable LLP). Re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements. April 30, 2018. United States Environmental Protection Agency, Washington, D.C. 20460. Office of Solid Waste and Emergency Response, now the Office of Land and Emergency Management.

Appendix B
Laboratory Analytical Reports

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-150045-1
Client Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Mr. Vincent Buening

Kris Brooks

Authorized for release by:
6/7/2021 4:13:23 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Qualifiers

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-150045-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-150045-1

Comments
No additional comments.

Receipt
The samples were received on 5/21/2021 6:45 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2º C.

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

General Chemistry
Method SM 2540C: The following samples were analyzed outside of analytical holding time due to method being added after hold time expired MW-16-01 (240-150045-1), MW-16-02 (240-150045-2), MW-16-03 (240-150045-3), MW-16-05 (240-150045-5), MW-16-06 (240-150045-6), MW-16-07 (240-150045-7), DUP-01 (240-150045-8) and EB-01 (240-150045-9).

Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-16-02 (240-150045-2), MW-16-03 (240-150045-3) and MW-16-04 (240-150045-4). 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.

Method Summary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CAN
6020	Metals (ICP/MS)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

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:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-150045-1	MW-16-01	Water	05/17/21 12:44	05/20/21 18:45	
240-150045-2	MW-16-02	Water	05/17/21 13:39	05/20/21 18:45	
240-150045-3	MW-16-03	Water	05/17/21 14:33	05/20/21 18:45	
240-150045-4	MW-16-04	Water	05/19/21 09:52	05/20/21 18:45	
240-150045-5	MW-16-05	Water	05/18/21 13:53	05/20/21 18:45	
240-150045-6	MW-16-06	Water	05/17/21 15:10	05/20/21 18:45	
240-150045-7	MW-16-07	Water	05/18/21 14:55	05/20/21 18:45	
240-150045-8	DUP-01	Water	05/17/21 00:00	05/20/21 18:45	
240-150045-9	EB-01	Water	05/17/21 11:40	05/20/21 18:45	

Detection Summary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-01 Lab Sample ID: 240-150045-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	510		100		ug/L	1		6010B	Total Recoverable
Calcium	79000		1000		ug/L	1		6020	Total Recoverable
Iron	1400		100		ug/L	1		6020	Total Recoverable
Chloride	700		10		mg/L	10		9056A	Total/NA
Fluoride	0.84		0.050		mg/L	1		9056A	Total/NA
Sulfate	31		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1200	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-02 Lab Sample ID: 240-150045-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1000		100		ug/L	1		6010B	Total Recoverable
Calcium	22000		1000		ug/L	1		6020	Total Recoverable
Iron	930		100		ug/L	1		6020	Total Recoverable
Chloride	650		10		mg/L	10		9056A	Total/NA
Fluoride	2.1		0.050		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1100	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-03 Lab Sample ID: 240-150045-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1100		100		ug/L	1		6010B	Total Recoverable
Calcium	20000		1000		ug/L	1		6020	Total Recoverable
Iron	530		100		ug/L	1		6020	Total Recoverable
Chloride	520		10		mg/L	10		9056A	Total/NA
Fluoride	2.2		0.050		mg/L	1		9056A	Total/NA
Total Dissolved Solids	970	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-04 Lab Sample ID: 240-150045-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	980		100		ug/L	1		6010B	Total Recoverable
Calcium	66000		1000		ug/L	1		6020	Total Recoverable
Iron	980		100		ug/L	1		6020	Total Recoverable
Chloride	3200		25		mg/L	25		9056A	Total/NA
Fluoride	1.5		0.25		mg/L	5		9056A	Total/NA
Total Dissolved Solids	5600		50		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-05 Lab Sample ID: 240-150045-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1200		100		ug/L	1		6010B	Total Recoverable

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-05 (Continued) Lab Sample ID: 240-150045-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Calcium	19000		1000		ug/L	1		6020	Total Recoverable
Iron	220		100		ug/L	1		6020	Total Recoverable
Chloride	560		10		mg/L	10		9056A	Total/NA
Fluoride	1.9		0.050		mg/L	1		9056A	Total/NA
Sulfate	15		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	970	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-06 Lab Sample ID: 240-150045-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	970		100		ug/L	1		6010B	Total Recoverable
Calcium	35000		1000		ug/L	1		6020	Total Recoverable
Iron	600		100		ug/L	1		6020	Total Recoverable
Chloride	500		5.0		mg/L	5		9056A	Total/NA
Fluoride	1.5		0.050		mg/L	1		9056A	Total/NA
Sulfate	60		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1000	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-07 Lab Sample ID: 240-150045-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	850		100		ug/L	1		6010B	Total Recoverable
Calcium	45000		1000		ug/L	1		6020	Total Recoverable
Iron	3400		100		ug/L	1		6020	Total Recoverable
Chloride	350		5.0		mg/L	5		9056A	Total/NA
Fluoride	1.3		0.050		mg/L	1		9056A	Total/NA
Sulfate	3.4		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	710	H	10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP-01 Lab Sample ID: 240-150045-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	510		100		ug/L	1		6010B	Total Recoverable
Calcium	79000		1000		ug/L	1		6020	Total Recoverable
Iron	1400		100		ug/L	1		6020	Total Recoverable
Chloride	710		10		mg/L	10		9056A	Total/NA
Fluoride	0.87		0.050		mg/L	1		9056A	Total/NA
Sulfate	31		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1300	H	20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB-01 Lab Sample ID: 240-150045-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-16-01 — Lab Sample ID: 240-150045-1

Date Collected: 05/17/21 12:44 — **Matrix: Water**
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	510		100		ug/L		05/26/21 14:00	05/27/21 20:33	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	79000		1000		ug/L		05/26/21 14:00	05/27/21 18:37	1
Iron	1400		100		ug/L		05/26/21 14:00	05/27/21 18:37	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	700		10		mg/L			06/04/21 22:02	10
Fluoride	0.84		0.050		mg/L			06/04/21 21:40	1
Sulfate	31		1.0		mg/L			06/04/21 21:40	1
Total Dissolved Solids	1200	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-02
Lab Sample ID: 240-150045-2
Date Collected: 05/17/21 13:39
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1000		100		ug/L		05/26/21 14:00	05/27/21 20:38	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	22000		1000		ug/L		05/26/21 14:00	05/27/21 18:39	1
Iron	930		100		ug/L		05/26/21 14:00	05/27/21 18:39	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	650		10		mg/L			06/04/21 07:02	10
Fluoride	2.1		0.050		mg/L			06/04/21 06:40	1
Sulfate	10	U	10		mg/L			06/04/21 07:02	10
Total Dissolved Solids	1100	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-03
Lab Sample ID: 240-150045-3
Date Collected: 05/17/21 14:33
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1100		100		ug/L		05/26/21 14:00	05/27/21 20:42	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	20000		1000		ug/L		05/26/21 14:00	05/27/21 18:42	1
Iron	530		100		ug/L		05/26/21 14:00	05/27/21 18:42	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	520		10		mg/L			06/04/21 07:45	10
Fluoride	2.2		0.050		mg/L			06/04/21 07:23	1
Sulfate	10	U	10		mg/L			06/04/21 07:45	10
Total Dissolved Solids	970	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-04
Lab Sample ID: 240-150045-4

Date Collected: 05/19/21 09:52
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	980		100		ug/L		05/26/21 14:00	05/27/21 20:46	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	66000		1000		ug/L		05/26/21 14:00	05/27/21 18:44	1
Iron	980		100		ug/L		05/26/21 14:00	05/27/21 18:44	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3200		25		mg/L			06/04/21 08:28	25
Fluoride	1.5		0.25		mg/L			06/04/21 08:07	5
Sulfate	5.0	U	5.0		mg/L			06/04/21 08:07	5
Total Dissolved Solids	5600		50		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-05
Lab Sample ID: 240-150045-5

Date Collected: 05/18/21 13:53
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1200		100		ug/L		05/26/21 14:00	05/27/21 20:51	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	19000		1000		ug/L		05/26/21 14:00	05/27/21 18:47	1
Iron	220		100		ug/L		05/26/21 14:00	05/27/21 18:47	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	560		10		mg/L			06/04/21 09:12	10
Fluoride	1.9		0.050		mg/L			06/04/21 08:50	1
Sulfate	15		1.0		mg/L			06/04/21 08:50	1
Total Dissolved Solids	970	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-06
Lab Sample ID: 240-150045-6

Date Collected: 05/17/21 15:10
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	970		100		ug/L		05/26/21 14:00	05/27/21 21:04	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	35000		1000		ug/L		05/26/21 14:00	05/27/21 18:54	1
Iron	600		100		ug/L		05/26/21 14:00	05/27/21 18:54	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	500		5.0		mg/L			06/04/21 10:39	5
Fluoride	1.5		0.050		mg/L			06/04/21 10:17	1
Sulfate	60		1.0		mg/L			06/04/21 10:17	1
Total Dissolved Solids	1000	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-07
Lab Sample ID: 240-150045-7

Date Collected: 05/18/21 14:55
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	850		100		ug/L		05/26/21 14:00	05/27/21 21:08	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	45000		1000		ug/L		05/26/21 14:00	05/27/21 18:57	1
Iron	3400		100		ug/L		05/26/21 14:00	05/27/21 18:57	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	350		5.0		mg/L			06/04/21 11:22	5
Fluoride	1.3		0.050		mg/L			06/04/21 11:00	1
Sulfate	3.4		1.0		mg/L			06/04/21 11:00	1
Total Dissolved Solids	710	H	10		mg/L			05/26/21 14:00	1

Client Sample ID: DUP-01
Date Collected: 05/17/21 00:00
Date Received: 05/20/21 18:45

Lab Sample ID: 240-150045-8
Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	510		100		ug/L		05/26/21 14:00	05/27/21 21:13	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	79000		1000		ug/L		05/26/21 14:00	05/27/21 18:59	1
Iron	1400		100		ug/L		05/26/21 14:00	05/27/21 18:59	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	710		10		mg/L			06/04/21 12:05	10
Fluoride	0.87		0.050		mg/L			06/04/21 11:44	1
Sulfate	31		1.0		mg/L			06/04/21 11:44	1
Total Dissolved Solids	1300	H	20		mg/L			05/26/21 14:00	1

Client: TRC Environmental Corporation.
Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: EB-01
Lab Sample ID: 240-150045-9
Date Collected: 05/17/21 11:40
Matrix: Water
Date Received: 05/20/21 18:45

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	100	U	100		ug/L		05/26/21 14:00	05/27/21 21:17	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	1000	U	1000		ug/L		05/26/21 14:00	05/27/21 19:02	1
Iron	100	U	100		ug/L		05/26/21 14:00	05/27/21 19:02	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			06/04/21 12:27	1
Fluoride	0.050	U	0.050		mg/L			06/04/21 12:27	1
Sulfate	1.0	U	1.0		mg/L			06/04/21 12:27	1
Total Dissolved Solids	10	U H	10		mg/L			05/26/21 14:00	1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 240-487623/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 487903 — **Prep Batch: 487623**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	100	U	100		ug/L		05/26/21 14:00	05/27/21 19:38	1

Lab Sample ID: LCS 240-487623/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 487903 — **Prep Batch: 487623**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1000	960		ug/L		96	80 - 120		

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-487623/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 488009 — **Prep Batch: 487623**

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	1000	U	1000		ug/L		05/26/21 14:00	05/27/21 17:57	1
Iron	100	U	100		ug/L		05/26/21 14:00	05/27/21 17:57	1

Lab Sample ID: LCS 240-487623/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 488009 — **Prep Batch: 487623**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Calcium			25000	24300		ug/L		97	80 - 120		
Iron			5000	4790		ug/L		96	80 - 120		

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-488923/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 488923

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			06/04/21 05:56	1
Fluoride	0.050	U	0.050		mg/L			06/04/21 05:56	1
Sulfate	1.0	U	1.0		mg/L			06/04/21 05:56	1

Lab Sample ID: LCS 240-488923/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 488923

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	50.2		mg/L		100	90 - 110		
Fluoride			2.50	2.63		mg/L		105	90 - 110		
Sulfate			50.0	50.7		mg/L		101	90 - 110		

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Job ID: 240-150045-1

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

Lab Sample ID: MB 240-487669/1
Matrix: Water
Analysis Batch: 487669

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10		mg/L			05/26/21 14:00	1

Lab Sample ID: LCS 240-487669/2
Matrix: Water
Analysis Batch: 487669

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			683	664		mg/L		97	80 - 120		

Lab Sample ID: 240-150045-1 DU
Matrix: Water
Analysis Batch: 487669

Client Sample ID: MW-16-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	1200	H		1260		mg/L				2	20

Metals

Prep Batch: 487623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-1	MW-16-01	Total Recoverable	Water	3005A	
240-150045-2	MW-16-02	Total Recoverable	Water	3005A	
240-150045-3	MW-16-03	Total Recoverable	Water	3005A	
240-150045-4	MW-16-04	Total Recoverable	Water	3005A	
240-150045-5	MW-16-05	Total Recoverable	Water	3005A	
240-150045-6	MW-16-06	Total Recoverable	Water	3005A	
240-150045-7	MW-16-07	Total Recoverable	Water	3005A	
240-150045-8	DUP-01	Total Recoverable	Water	3005A	
240-150045-9	EB-01	Total Recoverable	Water	3005A	
MB 240-487623/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-487623/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-487623/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 487903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-1	MW-16-01	Total Recoverable	Water	6010B	487623
240-150045-2	MW-16-02	Total Recoverable	Water	6010B	487623
240-150045-3	MW-16-03	Total Recoverable	Water	6010B	487623
240-150045-4	MW-16-04	Total Recoverable	Water	6010B	487623
240-150045-5	MW-16-05	Total Recoverable	Water	6010B	487623
240-150045-6	MW-16-06	Total Recoverable	Water	6010B	487623
240-150045-7	MW-16-07	Total Recoverable	Water	6010B	487623
240-150045-8	DUP-01	Total Recoverable	Water	6010B	487623
240-150045-9	EB-01	Total Recoverable	Water	6010B	487623
MB 240-487623/1-A	Method Blank	Total Recoverable	Water	6010B	487623
LCS 240-487623/2-A	Lab Control Sample	Total Recoverable	Water	6010B	487623

Analysis Batch: 488009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-1	MW-16-01	Total Recoverable	Water	6020	487623
240-150045-2	MW-16-02	Total Recoverable	Water	6020	487623
240-150045-3	MW-16-03	Total Recoverable	Water	6020	487623
240-150045-4	MW-16-04	Total Recoverable	Water	6020	487623
240-150045-5	MW-16-05	Total Recoverable	Water	6020	487623
240-150045-6	MW-16-06	Total Recoverable	Water	6020	487623
240-150045-7	MW-16-07	Total Recoverable	Water	6020	487623
240-150045-8	DUP-01	Total Recoverable	Water	6020	487623
240-150045-9	EB-01	Total Recoverable	Water	6020	487623
MB 240-487623/1-A	Method Blank	Total Recoverable	Water	6020	487623
LCS 240-487623/3-A	Lab Control Sample	Total Recoverable	Water	6020	487623

General Chemistry

Analysis Batch: 487669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-1	MW-16-01	Total/NA	Water	SM 2540C	
240-150045-2	MW-16-02	Total/NA	Water	SM 2540C	
240-150045-3	MW-16-03	Total/NA	Water	SM 2540C	
240-150045-4	MW-16-04	Total/NA	Water	SM 2540C	
240-150045-5	MW-16-05	Total/NA	Water	SM 2540C	
240-150045-6	MW-16-06	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 487669 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-7	MW-16-07	Total/NA	Water	SM 2540C	
240-150045-8	DUP-01	Total/NA	Water	SM 2540C	
240-150045-9	EB-01	Total/NA	Water	SM 2540C	
MB 240-487669/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-487669/2	Lab Control Sample	Total/NA	Water	SM 2540C	
240-150045-1 DU	MW-16-01	Total/NA	Water	SM 2540C	

Analysis Batch: 488923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-150045-1	MW-16-01	Total/NA	Water	9056A	
240-150045-1	MW-16-01	Total/NA	Water	9056A	
240-150045-2	MW-16-02	Total/NA	Water	9056A	
240-150045-2	MW-16-02	Total/NA	Water	9056A	
240-150045-3	MW-16-03	Total/NA	Water	9056A	
240-150045-3	MW-16-03	Total/NA	Water	9056A	
240-150045-4	MW-16-04	Total/NA	Water	9056A	
240-150045-4	MW-16-04	Total/NA	Water	9056A	
240-150045-5	MW-16-05	Total/NA	Water	9056A	
240-150045-5	MW-16-05	Total/NA	Water	9056A	
240-150045-6	MW-16-06	Total/NA	Water	9056A	
240-150045-6	MW-16-06	Total/NA	Water	9056A	
240-150045-7	MW-16-07	Total/NA	Water	9056A	
240-150045-7	MW-16-07	Total/NA	Water	9056A	
240-150045-8	DUP-01	Total/NA	Water	9056A	
240-150045-8	DUP-01	Total/NA	Water	9056A	
240-150045-9	EB-01	Total/NA	Water	9056A	
MB 240-488923/3	Method Blank	Total/NA	Water	9056A	
LCS 240-488923/4	Lab Control Sample	Total/NA	Water	9056A	

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-01 — Lab Sample ID: 240-150045-1

Date Collected: 05/17/21 12:44 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 20:33	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:37	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 21:40	JWW	TAL CAN
Total/NA	Analysis	9056A		10	488923	06/04/21 22:02	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-02 — Lab Sample ID: 240-150045-2

Date Collected: 05/17/21 13:39 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 20:38	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:39	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 06:40	JWW	TAL CAN
Total/NA	Analysis	9056A		10	488923	06/04/21 07:02	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-03 — Lab Sample ID: 240-150045-3

Date Collected: 05/17/21 14:33 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 20:42	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:42	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 07:23	JWW	TAL CAN
Total/NA	Analysis	9056A		10	488923	06/04/21 07:45	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-04 — Lab Sample ID: 240-150045-4

Date Collected: 05/19/21 09:52 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 20:46	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:44	DTN	TAL CAN
Total/NA	Analysis	9056A		5	488923	06/04/21 08:07	JWW	TAL CAN

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: MW-16-04 — Lab Sample ID: 240-150045-4

Date Collected: 05/19/21 09:52 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		25	488923	06/04/21 08:28	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-05 — Lab Sample ID: 240-150045-5

Date Collected: 05/18/21 13:53 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 20:51	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:47	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 08:50	JWW	TAL CAN
Total/NA	Analysis	9056A		10	488923	06/04/21 09:12	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-06 — Lab Sample ID: 240-150045-6

Date Collected: 05/17/21 15:10 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 21:04	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:54	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 10:17	JWW	TAL CAN
Total/NA	Analysis	9056A		5	488923	06/04/21 10:39	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: MW-16-07 — Lab Sample ID: 240-150045-7

Date Collected: 05/18/21 14:55 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 21:08	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:57	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 11:00	JWW	TAL CAN
Total/NA	Analysis	9056A		5	488923	06/04/21 11:22	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Client Sample ID: DUP-01 — Lab Sample ID: 240-150045-8

Date Collected: 05/17/21 00:00 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 21:13	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 18:59	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 11:44	JWW	TAL CAN
Total/NA	Analysis	9056A		10	488923	06/04/21 12:05	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Client Sample ID: EB-01 — Lab Sample ID: 240-150045-9

Date Collected: 05/17/21 11:40 — **Matrix: Water**
Date Received: 05/20/21 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010B		1	487903	05/27/21 21:17	DSH	TAL CAN
Total Recoverable	Prep	3005A			487623	05/26/21 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020		1	488009	05/27/21 19:02	DTN	TAL CAN
Total/NA	Analysis	9056A		1	488923	06/04/21 12:27	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	487669	05/26/21 14:00	AJ	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-150045-1
Project/Site: CCR DTE RRLF HMP Uppermost Aquifer

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-21
Iowa	State	421	06-01-21 *
Kansas	NELAP	E-10336	04-30-21 *
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton OH 44720
Phone (330) 497-9396 Phone (330) 497-0772

1-7/1.2

Chain of Custody Record

MICHIGAN 190

eurofins

Client Information	Sampler: Jake Kreutz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-82346-31929.1
Client Contact: Mr Vincent Buening	Phone: 734-395-9804	E-Mail: Kris.Brooks@Eurofinset.com	State of Origi	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 313-971 7080(Tel) 313-971-9022(Fax)	PO #: TBD			
Email: vbuening@trccompanies.com	WO #: 370029 0000 P1 T2			
Project Name: CCR DTE RRLF HMP Uppermost Aquifer	Project #: 24016807			
Site: Michigan	SSOW#:			

Analysis Requested

Preservation Codes

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 6020 Ca, B, Fe	2540C_Calcd TDS, 9056A_28D Chloride, Fluride, Sulfate	Total Number of containers	Special Instructions/Note
			Preservation Code:				D	N		
MW-16-01	5-17-21	1244	G	Water	N	N	X	X		
MW-16-02	5-17-21	1339	G	Water	N	N	X	X		
MW-16-03	5-17-21	1433	G	Water	N	N	X	X		
MW-16-04	5-19-21	0952	G	Water	N	N	X	X		
MW-16-05	5-18-21	1353	G	Water	N	N	X	X		
MW-16-06	5-17-21	1510	G	Water	N	N	X	X		
MW-16-07	5-18-21	1455	G	Water	N	N	X	X		
DUP-01	5-17-21	—	G	Water	N	N	X	X		
EB-01	5-17-21	1140	G	Water	N	N	X	X		
				Water						

240-150045 Chain of Custody

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements.

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		5-20-21 1742	TRC		5/21/21 1845	GT
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5 21 21 0800	Company ETA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 01/16/2019

6/7/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # .** 160045
Canton Facility

Client IEC Environmental Site Name _____ Cooler unpacked by: Colin G

Cooler Received on 5-21-21 Opened on 5-21-21

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag (None) Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp 11 °C Corrected Cooler Temp. 12 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4 Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	~~Yes~~	(No) HMS 5/26
6 Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7 Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(N) (Y)
10 Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11 Sufficient quantity received to perform indicated analyses?	(Yes)	No
12 Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	(Yes)	No NA pH Strip Lot# HC022887
14 Were VOAs on the COC?	Yes	(No)
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	No (NA)
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	(No)
17 Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: Ryan C

_____

_____

_____

_____

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI NC-099

Login Container Summary Report

Temperature readings. _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW 16-01	240-150045-A 1	Plastic 250ml - with Nitric Acid	<2			
MW-16-02	240-150045-A-2	Plastic 250ml with Nitric Acid	<2			
MW-16-03	240-150045-A-3	Plastic 250ml - with Nitric Acid	<2			
MW-16-04	240-150045-A-4	Plastic 250ml - with Nitric Acid	<2			
MW-16-05	240-150045-A-5	Plastic 250ml - with Nitric Acid	<2			
MW-16-06	240-150045-A-6	Plastic 250ml - with Nitric Acid	<2			
MW-16-07	240-150045 A-7	Plastic 250ml - with Nitric Acid	<2			
DUP-01	240-150045 A-8	Plastic 250ml - with Nitric Acid	<2			
EB-01	240-150045-A-9	Plastic 250ml - with Nitric Acid	<2			

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-152019-1
Client Project/Site: CCR DTE RRLF

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Mr. Vincent Buening

Patrick O'Meara

Authorized for release by:
7/6/2021 5:39:41 PM
Patrick O'Meara, Manager of Project Management
(330)966-5725
patrick.o'meara@eurofinset.com

Designee for

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@Eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Case Narrative

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Job ID: 240-152019-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-152019-1

Comments
No additional comments.

Receipt
The samples were received on 6/29/2021 @ 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN

Protocol References:

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:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-152019-1	MW-16-04_20210625	Water	06/25/21 12:55	06/29/21 10:30	
240-152019-2	MW-16-05_20210628	Water	06/28/21 11:20	06/29/21 10:30	
240-152019-3	DUP-01	Water	06/25/21 00:00	06/29/21 10:30	
240-152019-4	DUP-02	Water	06/28/21 00:00	06/29/21 10:30	
240-152019-5	EB-01	Water	06/24/21 08:45	06/29/21 10:30	

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: MW-16-04_20210625 — Lab Sample ID: 240-152019-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	5400		50		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-05_20210628 — Lab Sample ID: 240-152019-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	7.5		5.0		mg/L	5		9056A	Total/NA

Client Sample ID: DUP-01 — Lab Sample ID: 240-152019-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	5800		50		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP-02 — Lab Sample ID: 240-152019-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	7.3		5.0		mg/L	5		9056A	Total/NA

Client Sample ID: EB-01 — Lab Sample ID: 240-152019-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	17		10		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: MW-16-04_20210625
Date Collected: 06/25/21 12:55
Date Received: 06/29/21 10:30

Lab Sample ID: 240-152019-1
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5400		50		mg/L			07/01/21 08:03	1

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: MW-16-05_20210628
Date Collected: 06/28/21 11:20
Date Received: 06/29/21 10:30

Lab Sample ID: 240-152019-2
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	7.5		5.0		mg/L			07/02/21 08:10	5

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: DUP-01

Date Collected: 06/25/21 00:00
Date Received: 06/29/21 10:30

Lab Sample ID: 240-152019-3

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5800		50		mg/L			07/01/21 08:03	1

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: DUP-02
Date Collected: 06/28/21 00:00
Date Received: 06/29/21 10:30

Lab Sample ID: 240-152019-4
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	7.3		5.0		mg/L			07/02/21 08:32	5

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: EB-01

Date Collected: 06/24/21 08:45
Date Received: 06/29/21 10:30

Lab Sample ID: 240-152019-5

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0		mg/L			07/02/21 17:56	1
Total Dissolved Solids	**17**		10		mg/L			07/01/21 08:03	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-492925/63
Matrix: Water
Analysis Batch: 492925

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0		mg/L			07/02/21 02:23	1

Lab Sample ID: LCS 240-492925/64
Matrix: Water
Analysis Batch: 492925

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			50.0	50.8		mg/L		102	90 - 110		

Lab Sample ID: MB 240-493127/3
Matrix: Water
Analysis Batch: 493127

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0		mg/L			07/01/21 09:18	1

Lab Sample ID: LCS 240-493127/4
Matrix: Water
Analysis Batch: 493127

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			50.0	50.3		mg/L		101	90 - 110		

Lab Sample ID: MB 240-493348/3
Matrix: Water
Analysis Batch: 493348

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0		mg/L			07/02/21 10:20	1

Lab Sample ID: LCS 240-493348/4
Matrix: Water
Analysis Batch: 493348

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			50.0	50.8		mg/L		102	90 - 110		

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

Lab Sample ID: MB 240-493192/1
Matrix: Water
Analysis Batch: 493192

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10		mg/L			07/01/21 08:03	1

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

Lab Sample ID: LCS 240-493192/2
Matrix: Water
Analysis Batch: 493192

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			347	356		mg/L		103	80 - 120		

Lab Sample ID: 240-152019-1 DU
Matrix: Water
Analysis Batch: 493192

Client Sample ID: MW-16-04_20210625
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	5400			5260		mg/L				2	20

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

General Chemistry

Analysis Batch: 492925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-152019-2	MW-16-05_20210628	Total/NA	Water	9056A	
240-152019-4	DUP-02	Total/NA	Water	9056A	
MB 240-492925/63	Method Blank	Total/NA	Water	9056A	
LCS 240-492925/64	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 493127

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-493127/3	Method Blank	Total/NA	Water	9056A	
LCS 240-493127/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 493192

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-152019-1	MW-16-04_20210625	Total/NA	Water	SM 2540C	
240-152019-3	DUP-01	Total/NA	Water	SM 2540C	
240-152019-5	EB-01	Total/NA	Water	SM 2540C	
MB 240-493192/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-493192/2	Lab Control Sample	Total/NA	Water	SM 2540C	
240-152019-1 DU	MW-16-04_20210625	Total/NA	Water	SM 2540C	

Analysis Batch: 493348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-152019-5	EB-01	Total/NA	Water	9056A	
MB 240-493348/3	Method Blank	Total/NA	Water	9056A	
LCS 240-493348/4	Lab Control Sample	Total/NA	Water	9056A	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DTE RRLF

Job ID: 240-152019-1

Client Sample ID: MW-16-04_20210625
Lab Sample ID: 240-152019-1
Date Collected: 06/25/21 12:55
Matrix: Water
Date Received: 06/29/21 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	493192	07/01/21 08:03	AJ	TAL CAN

Client Sample ID: MW-16-05_20210628
Lab Sample ID: 240-152019-2
Date Collected: 06/28/21 11:20
Matrix: Water
Date Received: 06/29/21 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	492925	07/02/21 08:10	JMB	TAL CAN

Client Sample ID: DUP-01
Lab Sample ID: 240-152019-3
Date Collected: 06/25/21 00:00
Matrix: Water
Date Received: 06/29/21 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	493192	07/01/21 08:03	AJ	TAL CAN

Client Sample ID: DUP-02
Lab Sample ID: 240-152019-4
Date Collected: 06/28/21 00:00
Matrix: Water
Date Received: 06/29/21 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	492925	07/02/21 08:32	JMB	TAL CAN

Client Sample ID: EB-01
Lab Sample ID: 240-152019-5
Date Collected: 06/24/21 08:45
Matrix: Water
Date Received: 06/29/21 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	493348	07/02/21 17:56	JMB	TAL CAN
Total/NA	Analysis	SM 2540C		1	493192	07/01/21 08:03	AJ	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-152019-1
Project/Site: CCR DTE RRLF

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-21
Iowa	State	421	06-01-21 *
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

1.8/1.9

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
TRC	V. BUENING	6.28.21	181623
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page _____ of _____**
1540 EISENHOWER PL			
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	**Analysis (Attach list if more space is needed)**
ANN ARBOR / MI / 48108		KRIS BROOKS	
Project Name and Location (State)	**Carrier/Waybill Number**		
DTE CCR RRLF			
Contract/Purchase Order/Quote No.			
PO 1644681			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: TAS	Sulfate	Special Instructions/ Conditions of Receipt
MW-16-04_20210625	6.25.21	1255		1			1						X		
MW-16-05_20210628	6.28.21	1120		1			1							X	
DUP-01	6.25.21	″		1			1						X		
DUP-02	6.28.21	″		1			1							X	
EB-01	6.24.21	0845		1			1						X	X	

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

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

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other 3 DAY

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1.	B. YOLEN	6.28.21	1340	TA STORAGE	6.28.21	1340
2.				Cally McK	6/28/21	1345
3.	Cally McK	6/28/21	1355		6-29-21	1030

Comments

DISTRIBUTION: *WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy*

7/6/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client TRC Site Name _____ Cooler unpacked by: Trent

Cooler Received on 6-29-21 Opened on 6-29-21

FedEx: 1st Grd (Exp) UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam (Plastic Bag) None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	(Yes)	No NA pH Strip Lot# **HC022887**
14. Were VOAs on the COC?	Yes	(No)
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	(No)
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-158349-1
Client Project/Site: CCR DTE Range Road Landfill

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Mr. Vincent Buening

Authorized for release by:
11/3/2021 6:23:14 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Qualifiers

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-158349-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-158349-1

Comments
No additional comments.

Receipt
The samples were received on 10/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

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

General Chemistry
Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-16-03 (240-158349-4) and MW-16-04 (240-158349-5). 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.

Method Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CAN
6020	Metals (ICP/MS)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

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:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-158349-1	MW-16-01	Water	10/18/21 11:44	10/20/21 08:00
240-158349-2	DUP-01	Water	10/18/21 00:00	10/20/21 08:00
240-158349-3	MW-16-02	Water	10/18/21 12:32	10/20/21 08:00
240-158349-4	MW-16-03	Water	10/18/21 13:13	10/20/21 08:00
240-158349-5	MW-16-04	Water	10/18/21 10:26	10/20/21 08:00
240-158349-6	MW-16-05	Water	10/18/21 15:01	10/20/21 08:00
240-158349-7	MW-16-06	Water	10/18/21 13:54	10/20/21 08:00
240-158349-8	MW-16-07	Water	10/18/21 09:34	10/20/21 08:00
240-158349-9	EB-01	Water	10/18/21 10:50	10/20/21 08:00

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-01 — Lab Sample ID: 240-158349-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	510		100		ug/L	1		6010B	Total Recoverable
Calcium	77000		1000		ug/L	1		6020	Total Recoverable
Iron	1400		100		ug/L	1		6020	Total Recoverable
Chloride	550		10		mg/L	10		9056A	Total/NA
Fluoride	0.85		0.050		mg/L	1		9056A	Total/NA
Sulfate	41		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1200		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP-01 — Lab Sample ID: 240-158349-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	480		100		ug/L	1		6010B	Total Recoverable
Calcium	77000		1000		ug/L	1		6020	Total Recoverable
Iron	1400		100		ug/L	1		6020	Total Recoverable
Chloride	710		10		mg/L	10		9056A	Total/NA
Fluoride	0.85		0.050		mg/L	1		9056A	Total/NA
Sulfate	41		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1400		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-02 — Lab Sample ID: 240-158349-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	920		100		ug/L	1		6010B	Total Recoverable
Calcium	21000		1000		ug/L	1		6020	Total Recoverable
Iron	840		100		ug/L	1		6020	Total Recoverable
Chloride	660		10		mg/L	10		9056A	Total/NA
Fluoride	2.0		0.050		mg/L	1		9056A	Total/NA
Sulfate	1.7		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1100		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-03 — Lab Sample ID: 240-158349-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1100		100		ug/L	1		6010B	Total Recoverable
Calcium	19000		1000		ug/L	1		6020	Total Recoverable
Iron	550		100		ug/L	1		6020	Total Recoverable
Chloride	520		5.0		mg/L	5		9056A	Total/NA
Fluoride	2.2		0.050		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1000		20		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-04 — Lab Sample ID: 240-158349-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	880		100		ug/L	1		6010B	Total Recoverable
Calcium	63000		1000		ug/L	1		6020	Total Recoverable
Iron	850		100		ug/L	1		6020	Total Recoverable
Chloride	3200		25		mg/L	25		9056A	Total/NA
Fluoride	1.5		0.25		mg/L	5		9056A	Total/NA
Total Dissolved Solids	5100		50		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-05 — Lab Sample ID: 240-158349-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	1200		100		ug/L	1		6010B	Total Recoverable
Calcium	17000		1000		ug/L	1		6020	Total Recoverable
Iron	210		100		ug/L	1		6020	Total Recoverable
Chloride	560		10		mg/L	10		9056A	Total/NA
Fluoride	2.0		0.050		mg/L	1		9056A	Total/NA
Sulfate	3.0		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1100		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-06 — Lab Sample ID: 240-158349-7

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	900		100		ug/L	1		6010B	Total Recoverable
Calcium	46000		1000		ug/L	1		6020	Total Recoverable
Iron	770		100		ug/L	1		6020	Total Recoverable
Chloride	490		10		mg/L	10		9056A	Total/NA
Fluoride	1.4		0.050		mg/L	1		9056A	Total/NA
Sulfate	150		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	1200		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16-07 — Lab Sample ID: 240-158349-8

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Boron	880		100		ug/L	1		6010B	Total Recoverable
Calcium	45000		1000		ug/L	1		6020	Total Recoverable
Iron	2300		100		ug/L	1		6020	Total Recoverable
Chloride	350		5.0		mg/L	5		9056A	Total/NA
Fluoride	1.3		0.050		mg/L	1		9056A	Total/NA
Sulfate	3.8		1.0		mg/L	1		9056A	Total/NA
Total Dissolved Solids	670		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB-01 — Lab Sample ID: 240-158349-9

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-01

Date Collected: 10/18/21 11:44
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-1

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	510		100		ug/L		10/21/21 14:00	10/22/21 22:51	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	77000		1000		ug/L		10/21/21 14:00	10/25/21 20:22	1
Iron	1400		100		ug/L		10/21/21 14:00	10/25/21 20:22	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	550		10		mg/L			11/02/21 06:23	10
Fluoride	0.85		0.050		mg/L			11/02/21 06:03	1
Sulfate	41		1.0		mg/L			11/02/21 06:03	1
Total Dissolved Solids	1200		20		mg/L			10/22/21 07:57	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: DUP-01

Date Collected: 10/18/21 00:00
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-2

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	480		100		ug/L		10/21/21 14:00	10/22/21 22:56	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	77000		1000		ug/L		10/21/21 14:00	10/25/21 20:25	1
Iron	1400		100		ug/L		10/21/21 14:00	10/25/21 20:25	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	710		10		mg/L			11/02/21 07:04	10
Fluoride	0.85		0.050		mg/L			11/02/21 06:43	1
Sulfate	41		1.0		mg/L			11/02/21 06:43	1
Total Dissolved Solids	1400		20		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-02

Date Collected: 10/18/21 12:32
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-3

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	920		100		ug/L		10/21/21 14:00	10/22/21 23:00	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	21000		1000		ug/L		10/21/21 14:00	10/25/21 20:27	1
Iron	840		100		ug/L		10/21/21 14:00	10/25/21 20:27	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	660		10		mg/L			11/02/21 08:24	10
Fluoride	2.0		0.050		mg/L			11/02/21 08:04	1
Sulfate	1.7		1.0		mg/L			11/02/21 08:04	1
Total Dissolved Solids	1100		20		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-03

Date Collected: 10/18/21 13:13
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-4

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1100		100		ug/L		10/21/21 14:00	10/22/21 23:05	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	19000		1000		ug/L		10/21/21 14:00	10/25/21 20:30	1
Iron	550		100		ug/L		10/21/21 14:00	10/25/21 20:30	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	520		5.0		mg/L			11/02/21 09:04	5
Fluoride	2.2		0.050		mg/L			11/02/21 08:44	1
Sulfate	5.0	U	5.0		mg/L			11/02/21 09:04	5
Total Dissolved Solids	1000		20		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-04
Date Collected: 10/18/21 10:26
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-5
Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	880		100		ug/L		10/21/21 14:00	10/22/21 23:09	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	63000		1000		ug/L		10/21/21 14:00	10/25/21 20:32	1
Iron	850		100		ug/L		10/21/21 14:00	10/25/21 20:32	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3200		25		mg/L			11/02/21 09:45	25
Fluoride	1.5		0.25		mg/L			11/02/21 09:24	5
Sulfate	5.0	U	5.0		mg/L			11/02/21 09:24	5
Total Dissolved Solids	5100		50		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-05

Date Collected: 10/18/21 15:01
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-6

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	1200		100		ug/L		10/21/21 14:00	10/22/21 23:22	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	17000		1000		ug/L		10/21/21 14:00	10/25/21 20:35	1
Iron	210		100		ug/L		10/21/21 14:00	10/25/21 20:35	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	560		10		mg/L			11/02/21 11:05	10
Fluoride	2.0		0.050		mg/L			11/02/21 10:45	1
Sulfate	3.0		1.0		mg/L			11/02/21 10:45	1
Total Dissolved Solids	1100		20		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-06

Date Collected: 10/18/21 13:54
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-7

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	900		100		ug/L		10/21/21 14:00	10/22/21 23:27	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	46000		1000		ug/L		10/21/21 14:00	10/25/21 20:42	1
Iron	770		100		ug/L		10/21/21 14:00	10/25/21 20:42	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	490		10		mg/L			11/02/21 12:25	10
Fluoride	1.4		0.050		mg/L			11/02/21 12:05	1
Sulfate	150		1.0		mg/L			11/02/21 12:05	1
Total Dissolved Solids	1200		20		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-07

Date Collected: 10/18/21 09:34
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-8

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	880		100		ug/L		10/21/21 14:00	10/22/21 23:31	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	45000		1000		ug/L		10/21/21 14:00	10/25/21 20:45	1
Iron	2300		100		ug/L		10/21/21 14:00	10/25/21 20:45	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	350		5.0		mg/L			11/02/21 13:05	5
Fluoride	1.3		0.050		mg/L			11/02/21 12:45	1
Sulfate	3.8		1.0		mg/L			11/02/21 12:45	1
Total Dissolved Solids	670		10		mg/L			10/25/21 08:20	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: EB-01

Date Collected: 10/18/21 10:50
Date Received: 10/20/21 08:00

Lab Sample ID: 240-158349-9

Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	100	U	100		ug/L		10/21/21 14:00	10/22/21 23:36	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	1000	U	1000		ug/L		10/21/21 14:00	10/25/21 20:47	1
Iron	100	U	100		ug/L		10/21/21 14:00	10/25/21 20:47	1

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			11/02/21 13:26	1
Fluoride	0.050	U	0.050		mg/L			11/02/21 13:26	1
Sulfate	1.0	U	1.0		mg/L			11/02/21 13:26	1
Total Dissolved Solids	10	U	10		mg/L			10/25/21 08:20	1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 240-509270/1-A
Matrix: Water
Analysis Batch: 509522

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 509270

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Boron	100	U	100		ug/L		10/21/21 14:00	10/22/21 21:51	1

Lab Sample ID: LCS 240-509270/2-A
Matrix: Water
Analysis Batch: 509522

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 509270

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1000	1020		ug/L		102	80 - 120		

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-509270/1-A
Matrix: Water
Analysis Batch: 509863

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 509270

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Calcium	1000	U	1000		ug/L		10/21/21 14:00	10/25/21 19:45	1
Iron	100	U	100		ug/L		10/21/21 14:00	10/25/21 19:45	1

Lab Sample ID: LCS 240-509270/3-A
Matrix: Water
Analysis Batch: 509863

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 509270

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Calcium			25000	23300		ug/L		93	80 - 120		
Iron			5000	4990		ug/L		100	80 - 120		

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-510882/3
Matrix: Water
Analysis Batch: 510882

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			11/01/21 19:59	1
Fluoride	0.050	U	0.050		mg/L			11/01/21 19:59	1
Sulfate	1.0	U	1.0		mg/L			11/01/21 19:59	1

Lab Sample ID: MB 240-510882/45
Matrix: Water
Analysis Batch: 510882

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			11/02/21 10:05	1
Fluoride	0.050	U	0.050		mg/L			11/02/21 10:05	1
Sulfate	1.0	U	1.0		mg/L			11/02/21 10:05	1

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

Lab Sample ID: LCS 240-510882/4
Matrix: Water
Analysis Batch: 510882

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.9		mg/L		102	90 - 110
Fluoride	2.50	2.58		mg/L		103	90 - 110
Sulfate	50.0	51.4		mg/L		103	90 - 110

Lab Sample ID: LCS 240-510882/46
Matrix: Water
Analysis Batch: 510882

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.2		mg/L		102	90 - 110
Fluoride	2.50	2.60		mg/L		104	90 - 110
Sulfate	50.0	51.7		mg/L		103	90 - 110

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

Lab Sample ID: MB 240-509418/1
Matrix: Water
Analysis Batch: 509418

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10	mg/L			10/22/21 07:57	1

Lab Sample ID: LCS 240-509418/2
Matrix: Water
Analysis Batch: 509418

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	500	505		mg/L		101	80 - 120

Lab Sample ID: MB 240-509663/1
Matrix: Water
Analysis Batch: 509663

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10	mg/L			10/25/21 08:20	1

Lab Sample ID: LCS 240-509663/2
Matrix: Water
Analysis Batch: 509663

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	500	559		mg/L		112	80 - 120

Lab Sample ID: 240-158349-7 DU
Matrix: Water
Analysis Batch: 509663

Client Sample ID: MW-16-06
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1200		1210		mg/L		0.5	20

Metals

Prep Batch: 509270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-1	MW-16-01	Total Recoverable	Water	3005A	
240-158349-2	DUP-01	Total Recoverable	Water	3005A	
240-158349-3	MW-16-02	Total Recoverable	Water	3005A	
240-158349-4	MW-16-03	Total Recoverable	Water	3005A	
240-158349-5	MW-16-04	Total Recoverable	Water	3005A	
240-158349-6	MW-16-05	Total Recoverable	Water	3005A	
240-158349-7	MW-16-06	Total Recoverable	Water	3005A	
240-158349-8	MW-16-07	Total Recoverable	Water	3005A	
240-158349-9	EB-01	Total Recoverable	Water	3005A	
MB 240-509270/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-509270/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-509270/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 509522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-1	MW-16-01	Total Recoverable	Water	6010B	509270
240-158349-2	DUP-01	Total Recoverable	Water	6010B	509270
240-158349-3	MW-16-02	Total Recoverable	Water	6010B	509270
240-158349-4	MW-16-03	Total Recoverable	Water	6010B	509270
240-158349-5	MW-16-04	Total Recoverable	Water	6010B	509270
240-158349-6	MW-16-05	Total Recoverable	Water	6010B	509270
240-158349-7	MW-16-06	Total Recoverable	Water	6010B	509270
240-158349-8	MW-16-07	Total Recoverable	Water	6010B	509270
240-158349-9	EB-01	Total Recoverable	Water	6010B	509270
MB 240-509270/1-A	Method Blank	Total Recoverable	Water	6010B	509270
LCS 240-509270/2-A	Lab Control Sample	Total Recoverable	Water	6010B	509270

Analysis Batch: 509863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-1	MW-16-01	Total Recoverable	Water	6020	509270
240-158349-2	DUP-01	Total Recoverable	Water	6020	509270
240-158349-3	MW-16-02	Total Recoverable	Water	6020	509270
240-158349-4	MW-16-03	Total Recoverable	Water	6020	509270
240-158349-5	MW-16-04	Total Recoverable	Water	6020	509270
240-158349-6	MW-16-05	Total Recoverable	Water	6020	509270
240-158349-7	MW-16-06	Total Recoverable	Water	6020	509270
240-158349-8	MW-16-07	Total Recoverable	Water	6020	509270
240-158349-9	EB-01	Total Recoverable	Water	6020	509270
MB 240-509270/1-A	Method Blank	Total Recoverable	Water	6020	509270
LCS 240-509270/3-A	Lab Control Sample	Total Recoverable	Water	6020	509270

General Chemistry

Analysis Batch: 509418

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-1	MW-16-01	Total/NA	Water	SM 2540C	
MB 240-509418/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-509418/2	Lab Control Sample	Total/NA	Water	SM 2540C	

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

General Chemistry

Analysis Batch: 509663

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-2	DUP-01	Total/NA	Water	SM 2540C	
240-158349-3	MW-16-02	Total/NA	Water	SM 2540C	
240-158349-4	MW-16-03	Total/NA	Water	SM 2540C	
240-158349-5	MW-16-04	Total/NA	Water	SM 2540C	
240-158349-6	MW-16-05	Total/NA	Water	SM 2540C	
240-158349-7	MW-16-06	Total/NA	Water	SM 2540C	
240-158349-8	MW-16-07	Total/NA	Water	SM 2540C	
240-158349-9	EB-01	Total/NA	Water	SM 2540C	
MB 240-509663/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-509663/2	Lab Control Sample	Total/NA	Water	SM 2540C	
240-158349-7 DU	MW-16-06	Total/NA	Water	SM 2540C	

Analysis Batch: 510882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-158349-1	MW-16-01	Total/NA	Water	9056A	
240-158349-1	MW-16-01	Total/NA	Water	9056A	
240-158349-2	DUP-01	Total/NA	Water	9056A	
240-158349-2	DUP-01	Total/NA	Water	9056A	
240-158349-3	MW-16-02	Total/NA	Water	9056A	
240-158349-3	MW-16-02	Total/NA	Water	9056A	
240-158349-4	MW-16-03	Total/NA	Water	9056A	
240-158349-4	MW-16-03	Total/NA	Water	9056A	
240-158349-5	MW-16-04	Total/NA	Water	9056A	
240-158349-5	MW-16-04	Total/NA	Water	9056A	
240-158349-6	MW-16-05	Total/NA	Water	9056A	
240-158349-6	MW-16-05	Total/NA	Water	9056A	
240-158349-7	MW-16-06	Total/NA	Water	9056A	
240-158349-7	MW-16-06	Total/NA	Water	9056A	
240-158349-8	MW-16-07	Total/NA	Water	9056A	
240-158349-8	MW-16-07	Total/NA	Water	9056A	
240-158349-9	EB-01	Total/NA	Water	9056A	
MB 240-510882/3	Method Blank	Total/NA	Water	9056A	
MB 240-510882/45	Method Blank	Total/NA	Water	9056A	
LCS 240-510882/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 240-510882/46	Lab Control Sample	Total/NA	Water	9056A	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-01

Lab Sample ID: 240-158349-1

Date Collected: 10/18/21 11:44

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 22:51	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:22	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 06:03	JWW	TAL CAN
Total/NA	Analysis	9056A		10	510882	11/02/21 06:23	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509418	10/22/21 07:57	AJ	TAL CAN

Client Sample ID: DUP-01

Lab Sample ID: 240-158349-2

Date Collected: 10/18/21 00:00

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 22:56	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:25	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 06:43	JWW	TAL CAN
Total/NA	Analysis	9056A		10	510882	11/02/21 07:04	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: MW-16-02

Lab Sample ID: 240-158349-3

Date Collected: 10/18/21 12:32

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:00	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:27	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 08:04	JWW	TAL CAN
Total/NA	Analysis	9056A		10	510882	11/02/21 08:24	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: MW-16-03

Lab Sample ID: 240-158349-4

Date Collected: 10/18/21 13:13

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:05	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:30	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 08:44	JWW	TAL CAN

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-03

Lab Sample ID: 240-158349-4

Date Collected: 10/18/21 13:13

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	510882	11/02/21 09:04	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: MW-16-04

Lab Sample ID: 240-158349-5

Date Collected: 10/18/21 10:26

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:09	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:32	AJC	TAL CAN
Total/NA	Analysis	9056A		5	510882	11/02/21 09:24	JWW	TAL CAN
Total/NA	Analysis	9056A		25	510882	11/02/21 09:45	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: MW-16-05

Lab Sample ID: 240-158349-6

Date Collected: 10/18/21 15:01

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:22	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:35	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 10:45	JWW	TAL CAN
Total/NA	Analysis	9056A		10	510882	11/02/21 11:05	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: MW-16-06

Lab Sample ID: 240-158349-7

Date Collected: 10/18/21 13:54

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:27	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:42	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 12:05	JWW	TAL CAN
Total/NA	Analysis	9056A		10	510882	11/02/21 12:25	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-158349-1

Client Sample ID: MW-16-07

Lab Sample ID: 240-158349-8

Date Collected: 10/18/21 09:34

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:31	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:45	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 12:45	JWW	TAL CAN
Total/NA	Analysis	9056A		5	510882	11/02/21 13:05	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Client Sample ID: EB-01

Lab Sample ID: 240-158349-9

Date Collected: 10/18/21 10:50

Matrix: Water

Date Received: 10/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6010B		1	509522	10/22/21 23:36	RKT	TAL CAN
Total Recoverable	Prep	3005A			509270	10/21/21 14:00	SHB	TAL CAN
Total Recoverable	Analysis	6020		1	509863	10/25/21 20:47	AJC	TAL CAN
Total/NA	Analysis	9056A		1	510882	11/02/21 13:26	JWW	TAL CAN
Total/NA	Analysis	SM 2540C		1	509663	10/25/21 08:20	AJ	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Job ID: 240-158349-1
Project/Site: CCR DTE Range Road Landfill

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

05106

Chain of Custody Record

MICHIGAN 190

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Client Information	Sampler: Jake Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-76126-30501.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@Eurofinset.com		Page: Page 1 of 1
Company: TRC Environmental Corporation.				Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080				
Phone: 313-971-7080(Tel) 313-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #: 370029.0000 P1 T2			
Project Name: CCR DTE Range Road Landfill	Project #: 24016807			
Site: Leachate Sample Michigan	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B Ba, 6020 Ca, Na, Sb, As, B, Be, Cd, Cr, Co Cu, Fe, Pb, Li, Mg, Mo, Ni, K, Se, Ag, Tl, V, Zn 7470A Hg	9315_Ra226 - Standard Target List	9320_Ra228 - Standard Target List	2320B - Carb, BiCarb, Total Alkalinity	2540C_Calcd TDS, 9056A_28D Chloride, Fluoride, Sulfate	6010B Ca, B, Fe	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	N			
MW-16-01	10-18-21	1144	G	Water	N	N					X	X		
DUP-01	10-18-21	—	G	Water	N	N					X	X		
MW-16-02	10-18-21	1232	G	Water	N	N					X	X		
MW-16-03	10-18-21	1313	G	water	N	N					X	X		
MW-16-04	10-19-21	1026	G	water	N	N					X	X		
MW-16-05	10-18-21	1501	G	Water	N	N					X	X		
MW-16-06	10-18-21	1354	G	water	N	N					X	X		
MW-16-07	10-19-21	0934	G	water	N	N					X	X		
EB-01	10-18-21	1050	G	water	N	N					X	X		

240-158349 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-19-21 / 1413	TRC		10/19/21 1415	ETA
2		10/19/21 1415	ETA		10-20-21 0800	ETA
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 158349**
Canton Facility

Client TRC Environmental Site Name _____ Cooler unpacked by: Justin H

Cooler Received on 10-20-21 Opened on 10-20-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam (Plastic Bag) None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y(N), and sample type of grab/comp(Y/N)?	(Yes)	No
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	(Yes)	No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	Yes	(No)
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	(No)
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW-16-01	240-158349-B-1	Plastic 500ml - with Nitric Acid	<2			
DUP-01	240-158349-B-2	Plastic 500ml - with Nitric Acid	<2			
MW-16-02	240-158349-B-3	Plastic 500ml - with Nitric Acid	<2			
MW-16-03	240-158349-B-4	Plastic 500ml - with Nitric Acid	<2			
MW-16-04	240-158349-B-5	Plastic 500ml - with Nitric Acid	<2			
MW-16-05	240-158349-B-6	Plastic 500ml - with Nitric Acid	<2			
MW-16-06	240-158349-B-7	Plastic 500ml - with Nitric Acid	<2			
MW-16-07	240-158349-B-8	Plastic 500ml - with Nitric Acid	<2			
EB-01	240-158349-B-9	Plastic 500ml - with Nitric Acid	<2			

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-161243-1
Client Project/Site: CCR DTE Range Road Landfill

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Mr. Vincent Buening

Authorized for release by:
12/15/2021 3:29:15 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-161243-1
Project/Site: CCR DTE Range Road Landfill

Qualifiers

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Case Narrative

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Job ID: 240-161243-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-161243-1

Comments
No additional comments.

Receipt
The samples were received on 12/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7º C.

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN

Protocol References:

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:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-161243-1	MW-16-05_2021126	Water	12/06/21 12:15	12/10/21 08:00
240-161243-2	DUP-01_2021126	Water	12/06/21 00:00	12/10/21 08:00
240-161243-3	MW-16-06_2021126	Water	12/06/21 13:10	12/10/21 08:00
240-161243-4	DUP-02_2021126	Water	12/06/21 00:00	12/10/21 08:00
240-161243-5	EQUIPMENT BLANK_2021126	Water	12/06/21 13:20	12/10/21 08:00

Detection Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: MW-16-05_2021126 — Lab Sample ID: 240-161243-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.0		0.050		mg/L	1		9056A	Total/NA

Client Sample ID: DUP-01_2021126 — Lab Sample ID: 240-161243-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.0		0.050		mg/L	1		9056A	Total/NA

Client Sample ID: MW-16-06_2021126 — Lab Sample ID: 240-161243-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	1300		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP-02_2021126 — Lab Sample ID: 240-161243-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	1300		20		mg/L	1		SM 2540C	Total/NA

Client Sample ID: EQUIPMENT BLANK_2021126 — Lab Sample ID: 240-161243-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: MW-16-05_2021126
Date Collected: 12/06/21 12:15
Date Received: 12/10/21 08:00

Lab Sample ID: 240-161243-1
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	2.0		0.050		mg/L			12/11/21 09:20	1

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: DUP-01_2021126
Date Collected: 12/06/21 00:00
Date Received: 12/10/21 08:00

Lab Sample ID: 240-161243-2
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	2.0		0.050		mg/L			12/11/21 09:41	1

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: MW-16-06_2021126
Date Collected: 12/06/21 13:10
Date Received: 12/10/21 08:00

Lab Sample ID: 240-161243-3
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1300		20		mg/L			12/13/21 09:50	1

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: DUP-02_2021126
Date Collected: 12/06/21 00:00
Date Received: 12/10/21 08:00

Lab Sample ID: 240-161243-4
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1300		20		mg/L			12/13/21 09:50	1

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: EQUIPMENT BLANK_2021126

Lab Sample ID: 240-161243-5

Date Collected: 12/06/21 13:20
Matrix: Water
Date Received: 12/10/21 08:00

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.050	U	0.050		mg/L			12/11/21 10:03	1
Total Dissolved Solids	10	U	10		mg/L			12/13/21 09:50	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-516443/3
Matrix: Water
Analysis Batch: 516443

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.050	U	0.050		mg/L			12/11/21 08:36	1

Lab Sample ID: LCS 240-516443/4
Matrix: Water
Analysis Batch: 516443

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			2.50	2.70		mg/L		108	90 - 110		

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

Lab Sample ID: MB 240-516527/1
Matrix: Water
Analysis Batch: 516527

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10		mg/L			12/13/21 09:50	1

Lab Sample ID: LCS 240-516527/2
Matrix: Water
Analysis Batch: 516527

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			150	139		mg/L		93	80 - 120		

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

General Chemistry

Analysis Batch: 516443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-161243-1	MW-16-05_2021126	Total/NA	Water	9056A	
240-161243-2	DUP-01_2021126	Total/NA	Water	9056A	
240-161243-5	EQUIPMENT BLANK_2021126	Total/NA	Water	9056A	
MB 240-516443/3	Method Blank	Total/NA	Water	9056A	
LCS 240-516443/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 516527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-161243-3	MW-16-06_2021126	Total/NA	Water	SM 2540C	
240-161243-4	DUP-02_2021126	Total/NA	Water	SM 2540C	
240-161243-5	EQUIPMENT BLANK_2021126	Total/NA	Water	SM 2540C	
MB 240-516527/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-516527/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DTE Range Road Landfill

Job ID: 240-161243-1

Client Sample ID: MW-16-05_2021126
Lab Sample ID: 240-161243-1
Date Collected: 12/06/21 12:15
Matrix: Water
Date Received: 12/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	516443	12/11/21 09:20	AGC	TAL CAN

Client Sample ID: DUP-01_2021126
Lab Sample ID: 240-161243-2
Date Collected: 12/06/21 00:00
Matrix: Water
Date Received: 12/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	516443	12/11/21 09:41	AGC	TAL CAN

Client Sample ID: MW-16-06_2021126
Lab Sample ID: 240-161243-3
Date Collected: 12/06/21 13:10
Matrix: Water
Date Received: 12/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	516527	12/13/21 09:50	KMS	TAL CAN

Client Sample ID: DUP-02_2021126
Lab Sample ID: 240-161243-4
Date Collected: 12/06/21 00:00
Matrix: Water
Date Received: 12/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	516527	12/13/21 09:50	KMS	TAL CAN

Client Sample ID: EQUIPMENT BLANK_2021126
Lab Sample ID: 240-161243-5
Date Collected: 12/06/21 13:20
Matrix: Water
Date Received: 12/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	516443	12/11/21 10:03	AGC	TAL CAN
Total/NA	Analysis	SM 2540C		1	516527	12/13/21 09:50	KMS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-161243-1
Project/Site: CCR DTE Range Road Landfill

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

06/07

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing America

Client Information	Sampler: Andrew Whaley	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-89261-33863.1
Client Contact: Mr. Vincent Buening	Phone:	E-Mail: Kris.Brooks@Eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:

Address: 1540 Eisenhower Place	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Ann Arbor	TAT Requested (days): 3 DAY		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No		
Phone: 313-971-7080(Tel) 313-971-9022(Fax)	PO #: TBD		
Email: vbuening@trccompanies.com	WO #: 370029.0000 P1 T2		
Project Name: CCR DTE Range Road Landfill	Project #: 24016807		
Site: Michigan	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A_28D - Fluoride	9056A_28D - Chloride	2540C_Calcd - TDS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
MW-16-05_202126	12.6.21	1215	G	Water	N	N	X			1	
Dup-01_202126	12.6.21		G	Water	N	N	X			1	
MW-16-06_202126	12.6.21	1310	G	Water	N	N			X	1	
Dup-02_2021_126	12.6.21		G	Water	N	N			X	1	
Equipment Blank_202126	12.6.21	1320	G	Water	N	N	X		X	4	
				Water							
				Water							

240-161243 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by: Andrew Whaley	Date/Time: 12.6.21 1625	Company TRC	Received by: TRC storage	Date/Time: 12.6.21	Company TRC
Relinquished by:	Date/Time: 12/9/21 1030	Company TRC	Received by:	Date/Time: 12/9/21 10:30	Company ETA
Relinquished by:	Date/Time: 12/9/21 1350	Company	Received by:	Date/Time: 12-10-21 800	Company ETA

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

12/15/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 161243**
Canton Facility

Client IRC Site Name

Cooler unpacked by: Nancy Rose

Cooler Received on 12-10-21 Opened on 12-10-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # (A) Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	(No)
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Yes)	No
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	(No)
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	(No)
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event May 2021
DTE Electric Company Range Road Landfill (DTE RRLF)

Groundwater samples were collected by TRC for the May 2021 sampling event. Samples were analyzed for anions, total recoverable metals and total dissolved solids by Eurofins-Test America Laboratories, Inc. (Eurofins-TA), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-150045-1.

During the May 2021 sampling event, a groundwater sample was collected from each of the following wells:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-05
- MW-16-06
- MW-16-07

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Recoverable Boron	SW846 3005A/6010B
Total Recoverable Calcium	SW846 3005A/6020
Total Dissolved Solids	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary

- Samples MW-16-01, MW-16-02, MW-16-03, MW-16-06, DUP-01, and EB-01 were analyzed two days past the holding time and samples MW-16-05 and MW-16-07 were analyzed one day past the holding time for TDS; the positive and non-detect results for TDS are potentially biased low, as summarized in the attached table, Appendix B.
- Target analytes were not detected in the equipment blank (EB-01).
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed for the anions or total recoverable metals analyses as required by the QAPP.
- Laboratory duplicate analysis was performed on sample MW-16-01 for TDS; the relative percent difference (RPD) was within the QC limits.
- DUP-01 corresponds with MW-16-01; RPDs between the parent and duplicate sample were within the QC limits.

Laboratory Data Quality Review
Groundwater Monitoring Event June 2021 - Verification
DTE Electric Company Range Road Landfill (DTE RRLF)

Groundwater samples were collected by TRC for the June 2021 verification sampling event. Samples were analyzed for sulfate and/or total dissolved solids by Eurofins-Test America Laboratories, Inc. (Eurofins-TA), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-152019-1.

During the June 2021 sampling event, a groundwater sample was collected from each of the following wells and locations:

- MW-16-04
- MW-16-05

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Sulfate	SW846 9056A
Total Dissolved Solids (TDS)	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for matrix spike and matrix spike duplicate samples (MS/MSDs), where applicable. The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates, where applicable. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and

- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary:

- TDS was detected in the equipment blank (EB-01). However, results for TDS in the associated samples were > 10x the equipment blank concentration; thus, there is no impact on data usability due to this issue.
- Target analytes were not detected in the method blanks.
- LCS recoveries for target analytes were within laboratory control limits.
- MS/MSD analyses were not performed for the sulfate analyses as required by the quality assurance project plan (QAPP).
- Laboratory duplicate analysis was performed on sample MW-16-04 for TDS; all criteria were met.
- Dup-01 corresponds with MW-16-04 and Dup-02 corresponds with MW-16-05; relative percent differences (RPDs) between the parent and duplicate samples were within the QC limits.

Laboratory Data Quality Review
Groundwater Monitoring Event October 2021
DTE Electric Company Range Road Landfill (DTE RRLF)

Groundwater samples were collected by TRC for the October 2021 sampling event. Samples were analyzed for anions, total recoverable metals, and total dissolved solids by Euorfins-Test America Laboratories, Inc. (Euorfins-TA), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-158349-1.

During the October 2021 sampling event, a groundwater sample was collected from each of the following wells:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-05
- MW-16-06
- MW-16-07

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Recoverable Boron	SW846 3005A/6010B
Total Recoverable Calcium	SW846 3005A/6020
Total Dissolved Solids (TDS)	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for matrix spike and matrix spike duplicate samples (MS/MSDs), where applicable. The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;

- Data for laboratory duplicates, where applicable. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary

- There was one equipment blank submitted with this dataset (EB-01). No target analytes were detected in the equipment blank.
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory QC limits.
- MS/MSD analyses were not performed on a groundwater sample for total recoverable metals and anions in this data set. Per the project quality assurance project plan (QAPP), MS/MSD analyses are required for total recoverable calcium and boron, and anions at a frequency of 1 per 20 samples.
- Laboratory duplicate analysis was performed for TDS on sample MW-16-06. The relative percent difference (RPD) was within the QC limit.
- The field duplicate pair samples were MW-16-01 and DUP-01; RPDs between the parent and duplicate sample were within the QC limits.
- The RL for boron (100 µg/L) was below the RL specified in the QAPP of 200 µg/L. However, there is no impact on data usability due to this issue since all detected sample results for boron were > 200 µg/L.
- The nondetect RLs (5.0 mg/L) for sulfate in samples MW-16-03 and MW-16-04 were above the QAPP-specified RL (1.0 mg/L) due to a 5-fold dilution likely performed due to elevated concentrations of chloride.

Laboratory Data Quality Review
Groundwater Monitoring Event December 2021
DTE Electric Company Range Road Landfill (DTE RRLF)

Groundwater samples were collected by TRC for the December 2021 sampling event. Samples were analyzed for fluoride and total dissolved solids by Euorfins-Test America Laboratories, Inc. (Euorfins-TA), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-161243-1.

During the December 2021 sampling event, a groundwater sample was collected from each of the following wells:

- MW-16-05
- MW-16-06

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride)	SW846 9056A
Total Dissolved Solids (TDS)	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for matrix spike and matrix spike duplicate samples (MS/MSDs), where applicable. The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates, where applicable. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents and iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary

- There was one equipment blank submitted with this dataset (EQUIPMENT-BLANK). No target analytes were detected in the equipment blank.
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory QC limits.
- MS/MSD analyses were not performed on a groundwater sample for total recoverable metals and anions in this data set. Per the project quality assurance project plan (QAPP), MS/MSD analyses are required for total recoverable calcium and boron, and anions at a frequency of 1 per 20 samples.
- The field duplicate pair samples were MW-16-05 with DUP-01 and MW-16-06 with DUP-02; RPDs between the parent and duplicate sample were within the QC limits.
- The nondetect RLs (20 mg/L) for TDS in samples MW-16-06 and DUP-02 were above the QAPP-specified RL (10 mg/L). TDS was detected above 20 mg/L in both samples; therefore, data usability is not affected.

Appendix D
Uppermost Useable Aquifer Prediction Limit Update

1540 Eisenhower Pl.
Ann Arbor, MI 48108

T 734.971.7080
TRCcompanies.com

Technical Memorandum

Date:	December 15, 2021
To:	Chris Scieszka, DTE Electric Company
From:	Vince Buening, TRC Sarah Holmstrom, TRC Kristin Lowery, TRC
Project No.:	413591.0000.0000 Phase 1 Task 1
Subject:	Uppermost Useable Aquifer Prediction Limit Update – DTE Electric Company, Range Road Coal Combustion Residual Landfill

Statistical background limits for the DTE Electric Company (DTE Electric) Range Road Landfill (RRLF) coal combustion residual (CCR) unit were initially established for the Uppermost Useable Aquifer in the January 15, 2018 Technical Memorandum titled "Background Statistical Evaluation" pursuant to the United States Environmental Protection Agency's (U.S. EPA's) Resource Conservation and Recovery Act (RCRA) Federal Final Rule for Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities (herein after "the CCR Rule") promulgated on April 17, 2015, as amended. As described in the initial statistical limit calculation, background was established under a constrained schedule that captured limited natural temporal trends in groundwater quality. In addition, DTE Electric has since updated the Hydrogeological Monitoring Plan for the DTE Electric Company Range Road Ash Disposal Facility (2020 HMP) (TRC, November 2019, Revised May 2020), to provide a means to comply with applicable monitoring requirements described in the Part 115 of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended (Part 115) and the CCR Rule. The HMP was approved by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on May 15, 2020 to replace the March 2009 HMP.

As such, DTE Electric is updating the background statistical limits for the RRLF Uppermost Useable Aquifer monitoring wells to include the additional rounds of semiannual monitoring data collected and incorporate additional temporal variability observed subsequent to the initial statistical limit calculation in 2017. This memorandum presents the updated background statistical limits derived for the RRLF Uppermost Useable Aquifer monitoring wells.

Per the Uppermost Useable Aquifer Groundwater Monitoring System Summary Report (TRC, October 2017, revised April 2020), the groundwater monitoring system for the RRLF consists of the following locations for detection monitoring:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-05
- MW-16-06
- MW-16-07

And, per the HMP, statistical analysis is performed for the following detection monitoring parameters:

- Boron
- Calcium
- Chloride
- Fluoride
- Iron
- pH
- Sulfate
- Total Dissolved Solids (TDS)

Due to the limited implementation timeline of the CCR Rule, background data was collected during sampling events spaced one to two months apart to allow the minimum of eight sampling events to be completed before October 17, 2017. The short duration of the background sampling events limits the ability of the statistical analysis to capture the natural temporal variations in the groundwater quality at the RRLF Uppermost Useable Aquifer. This limited temporal variability can only be corrected with the collection of additional groundwater data, and the inclusion of the additional data in the background data set updated in the future, as long as data continue to show no impacts from the CCR unit. As a result of site-specific geologic conditions presented in the 2017, 2018, 2019, and 2020 Annual Reports (TRC, January 2018, January 2019, January 2020, and January 2021), downward migration of CCR leachate is not expected due to the presence of the underlying clay, and groundwater data continue to show no impacts from the CCR unit. Therefore, the seven additional rounds of detection monitoring data and the verification sample results[1] have been incorporated into the background dataset and the prediction limit calculations have been updated using data collected from August 2016 through October 2020 as detailed below, with the exception of iron. Iron was recently added to the monitoring program to align with Part 115. Background limits for iron will be calculated once a minimum of eight background data points have been collected.

The background data for the RRLF were evaluated in accordance with the *Uppermost Useable Aquifer Groundwater Statistical Evaluation Plan* (Stats Plan) (TRC, October 2017, Revised April 2020). Background data were evaluated in ChemStat™ statistical software. ChemStat™ is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in U.S. EPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (Unified Guidance; UG). Within the ChemStat™ statistical program (and the UG), prediction limits (PLs) were selected to perform the statistical calculation for background limits. Use of PLs is recommended by the UG to provide high statistical power and is an acceptable approach for intrawell detection monitoring under the CCR Rule. PLs were calculated for each of the constituents included in Appendix III of the CCR Rule (total boron, total calcium, chloride, fluoride, pH, sulfate, and total dissolved solids)[2]. The following narrative describes the methods employed and the results obtained. The ChemStat™ output files are included as an attachment.

The set of background wells utilized for RRLF CCR Unit includes MW 16-01 through MW-16-07. The background evaluation included the following steps:

[1] Verification sampling results used to confirm or deny potential statistically significant increases (SSIs) have been averaged with the compliance sample results for statistical limit calculation.

[2] The Stats Plan includes total iron as a detection monitoring constituent. Per the Stats Plan, the background sampling period is a minimum of eight events. Background limits for iron will be calculated following the collection of eight rounds of background data. Only two rounds of data have been collected for iron to date; therefore, background limits were not calculated.

- Review of data quality checklists for the baseline/background data sets for CCR Appendix III constituents;
- Graphical representation of the baseline data as time versus concentration (T v. C) by well/constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of percentage of non-detects for each baseline/background well-constituent (w/c) pair;
- Distribution of the data; and
- Calculation of the upper PLs for each cumulative baseline/background data set (upper and lower PLs were calculated for field pH).

The results of these evaluations are presented and discussed below.

Data Quality

Data from each sampling round were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The review was completed using the following quality control (QC) information which at a minimum included chain-of-custody forms, investigative sample results including blind field duplicates, and, as provided by the laboratory, method blanks, laboratory control spikes, laboratory duplicates. The data were found to be complete and usable for the purposes of the CCR monitoring program.

Time versus Concentration Graphs

The time versus concentration (T v. C) graphs (Attachment A) show potential or suspect outliers for one or more of the Appendix III parameters at MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017.

While variations in results are present, the graphs show consistent baseline data and do not suggest that data sets, as a whole, likely have overall trending or seasonality. However, due to limitations on CCR Rule implementation timelines, the data sets are of relatively short duration for making such observations regarding overall trending or seasonality.

Outlier Testing

Outlier removal from the background data set is summarized in Table 1. Probability plots (Attachment A) were used to further evaluate the potential outliers in the Appendix III data for MW-16-07 that were identified in the T v. C graphs (Attachment A). In general, probability plots of the data residuals show that data collected on 3/2/2017, 4/19/2017, and 6/8/2017 were from a different distribution than the remaining data. This pattern was observed for most of the Appendix III parameters for MW-16-07. Prior to outlier removal, most of the parameters for MW-16-07 exhibited a non-normal distribution. The data sets for most of the parameters exhibited a normal distribution after the removal of these outliers. As such, data collected from monitoring well MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were removed from the background data set used to calculate the statistical limit.

Distribution of the Data Sets

ChemStat™ was utilized to evaluate each data set for normality. If the skewness coefficient was calculated to be between negative one and one, then the data were assumed to be approximately normally distributed. If the skewness coefficient was calculated as greater than one (or less than negative one) then the calculation was performed on the natural log (Ln) of the data. If the Ln of the data still determined that the data appeared to be skewed, then the Shapiro-Wilk test of normality (Shapiro-Wilk) was performed. The Shapiro-Wilk statistic was calculated on both non-transformed data, and the Ln-transformed data. If the Shapiro-Wilk statistic indicated that normal distributional assumptions were not valid, then the parameter was considered a candidate for non-parametric statistical evaluation. The data distributions are summarized in Table 2.

Prediction Limits

Table 2 presents the calculated PLs for the background/baseline data sets. For normal and lognormal distributions, PLs are calculated for 95 percent confidence using parametric methods. For nonnormal background datasets, a nonparametric PL is utilized, resulting in the highest value from the background dataset as the PL. The achieved confidence levels for nonparametric prediction limits depend entirely on the number of background data points, which are shown in the ChemStat™ outputs. Verification resampling (1 of 2) is recommended per the Stats Plan and UG to achieve performance standards specified in the CCR Rule.

Attachments

Table 1 – Summary of Outlier Evaluation
Table 2 – Summary of Descriptive Statistics and Prediction Limit Calculations
Attachment A – ChemStat™ Prediction Limit Outputs

Tables

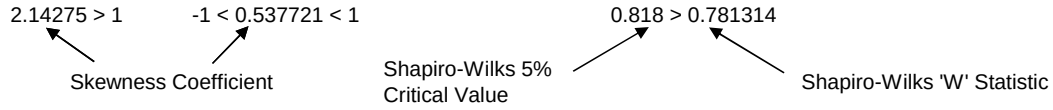
Table 1
Summary of Outlier Evaluation
DTE Electric Company – Range Road Landfill

Parameter	Units	Monitoring Well	Sample Date	Data Outlier	Basis for Removal of Outlier
Boron	ug/L	MW-16-07	03/02/17	230	Time vs. concentration graphs and probability plots indicate that data are anomalous for most of the parameters analyzed during these sampling events at MW-16-07.
		MW-16-07	04/19/17	120	
		MW-16-07	06/08/17	190	
Calcium	ug/L	MW-16-07	03/02/17	160,000	
		MW-16-07	04/19/17	170,000	
		MW-16-07	06/08/17	150,000	
Chloride	mg/L	MW-16-07	03/02/17	41	
		MW-16-07	04/19/17	40	
		MW-16-07	06/08/17	64	
Fluoride	mg/L	MW-16-07	03/02/17	0.33	
		MW-16-07	04/19/17	0.31	
		MW-16-07	06/08/17	< 0.50	
pH, Field	SU	MW-16-07	03/02/17	7.37	
		MW-16-07	04/19/17	7.41	
		MW-16-07	06/08/17	7.48	
Sulfate	mg/L	MW-16-07	03/02/17	290	
		MW-16-07	04/19/17	260	
		MW-16-07	06/08/17	270	
Total Dissolved Solids	mg/L	MW-16-07	03/02/17	910	
		MW-16-07	04/19/17	720	
		MW-16-07	06/08/17	760	

Table 2
Summary of Descriptive Statistics and Prediction Limit Calculations
DTE Electric Company – Range Road Landfill

Monitoring Well	Skewness Test		Shapiro-Wilks Test (5% Critical Value)		Outliers Removed	Prediction Limit Test	Prediction Limit
	Un-Transformed Data	Natural Log Transformed Data	Un-Transformed Data	Natural Log Transformed Data			
Appendix III							
Boron (ug/L)							
MW-16-01	-1 < -0.0680414 < 1	--	--	--	N	Parametric	620
MW-16-02	-1.29879 < -1	-1.34788 < -1	0.887 > 0.641665	0.887 > 0.635714	N	Non-Parametric	1,200
MW-16-03	-1 < -0.924486 < 1	--	--	--	N	Parametric	1,300
MW-16-04	-1 < 0.0121214 < 1	--	--	--	N	Parametric	1,200
MW-16-05	-1 < -0.485311 < 1	--	--	--	N	Parametric	1,400
MW-16-06	-1 < -0.588193 < 1	--	--	--	N	Parametric	1,200
MW-16-07	-1.04168 < -1	-1.25786 < -1	0.892 < 0.92156	--	Y	Parametric	980
Calcium (ug/L)							
MW-16-01	-1 < 0.210916 < 1	--	--	--	N	Parametric	87,000
MW-16-02	-1 < -0.55517 < 1	--	--	--	N	Parametric	24,000
MW-16-03	1 < 2.75228	1 < 2.44456	0.887 > 0.606759	0.887 > 0.661946	N	Non-Parametric	28,000
MW-16-04	-1 < -0.407028 < 1	--	--	--	N	Parametric	68,000
MW-16-05	-1.28621 < 1	-1.4875 < -1	0.887 > 0.677722	0.887 > 0.664542	N	Non-Parametric	19,000
MW-16-06	-1 < 0.470455 < 1	--	--	--	N	Parametric	34,000
MW-16-07	-1 < 0.423203 < 1	--	--	--	Y	Parametric	59,000
Chloride (mg/L)							
MW-16-01	-1 < -0.21742 < 1	--	--	--	N	Parametric	770
MW-16-02	-1 < -0.206976 < 1	--	--	--	N	Parametric	720
MW-16-03	-1 < -0.0289627 < 1	--	--	--	N	Parametric	580
MW-16-04	-1 < -0.358438 < 1	--	--	--	N	Parametric	3,600
MW-16-05	-1 < -0.0223709 < 1	--	--	--	N	Parametric	630
MW-16-06	-1 < -0.369595 < 1	--	--	--	N	Parametric	580
MW-16-07	-1.49399 < -1	-1.82389 < -1	0.892 > 0.826736	0.892 > 0.775702	Y	Non-Parametric	380
Fluoride (mg/L)							
MW-16-01	-1.47268 < -1	-1.62785 < -1	0.887 > 0.847147	0.887 > 0.820561	N	Non-Parametric	0.90
MW-16-02	-1 < -0.775096 < 1	--	--	--	N	Parametric	2.1
MW-16-03	-1.21268 < -1	1.30559 < -1	0.887 > 0.778413	0.887 > 0.769587	N	Non-Parametric	2.2
MW-16-04	-1 < -0.168294 < 1	--	--	--	N	Parametric	1.7
MW-16-05	-1 < -0.741358 < 1	--	--	--	N	Parametric	2.0
MW-16-06	-1.57185 < -1	-1.65111 < -1	0.887 > 0.648129	0.887 > 0.636114	N	Non-Parametric	1.5
MW-16-07	-1 < '-0.739376 < 1	--	--	--	Y	Parametric	1.3

Notes:

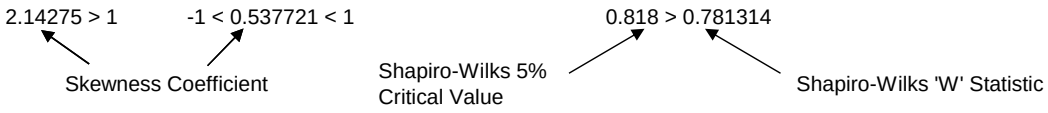


ug/L = micrograms per liter
mg/L = milligrams per liter
SU = standard units

Table 2
Summary of Descriptive Statistics and Prediction Limit Calculations
DTE Electric Company – Range Road Landfill

Monitoring Well	Skewness Test		Shapiro-Wilks Test (5% Critical Value)		Outliers Removed	Prediction Limit Test	Prediction Limit
	Un-Transformed Data	Natural Log Transformed Data	Un-Transformed Data	Natural Log Transformed Data			
pH, Field (SU)							
MW-16-01	-1 < 0.36183 < 1	--	--	--	N	Parametric	7.1 - 8.2
MW-16-02	1 < 2.41425	1 < 2.34693	0.887 > 0.682233	0.887 > 0.694457	N	Non-Parametric	8.2 - 9.0
MW-16-03	1 < 2.37546	1 < 2.31227	0.887 > 0.685816	0.887 > 0.698101	N	Non-Parametric	8.0 - 8.8
MW-16-04	-1 < -0.829411 < 1	--	--	--	N	Parametric	7.6 - 8.6
MW-16-05	1 < 2.30589	1 < 2.21955	0.887 > 0.735057	0.887 > 0.750874	N	Non-Parametric	8.0 - 8.9
MW-16-06	-1 < 0.409927 < 1	--	--	--	N	Parametric	7.6 - 8.3
MW-16-07	-1 < 0.225935 < 1	--	--	--	Y	Parametric	7.3 - 8.4
Sulfate (mg/L)							
MW-16-01	-1 < 0.362098 < 1	--	--	--	N	Parametric	45
MW-16-02	> 50% Non-Detect	--	--	--	N	Non-Parametric	10
MW-16-03	> 50% Non-Detect	--	--	--	N	Non-Parametric	10
MW-16-04	> 50% Non-Detect	--	--	--	N	Non-Parametric	50
MW-16-05	1 < 1.35571	-1 < -0.55014 < 1	--	--	N	Parametric	10
MW-16-06	-1 < 0.20805 <1	--	--	--	N	Parametric	54
MW-16-07	1 < 2.24946	-1 < 0.410858 < 1	--	--	Y	Parametric	74
Total Dissolved Solids (mg/L)							
MW-16-01	-1 < 0 <1	--	--	--	N	Parametric	1,300
MW-16-02	-1 < -0.251976 < 1	--	--	--	N	Parametric	1,300
MW-16-03	-1 < 0.0313701 < 1	--	--	--	N	Parametric	1,100
MW-16-04	-1 < 0.0534119 < 1	--	--	--	N	Parametric	5,300
MW-16-05	-1 < -0.372395 < 1	--	--	--	N	Parametric	1,200
MW-16-06	-1 < 0.357082 < 1	--	--	--	N	Parametric	1,100
MW-16-07	-1 < 0.870173 < 1	--	--	--	Y	Parametric	760

Notes:

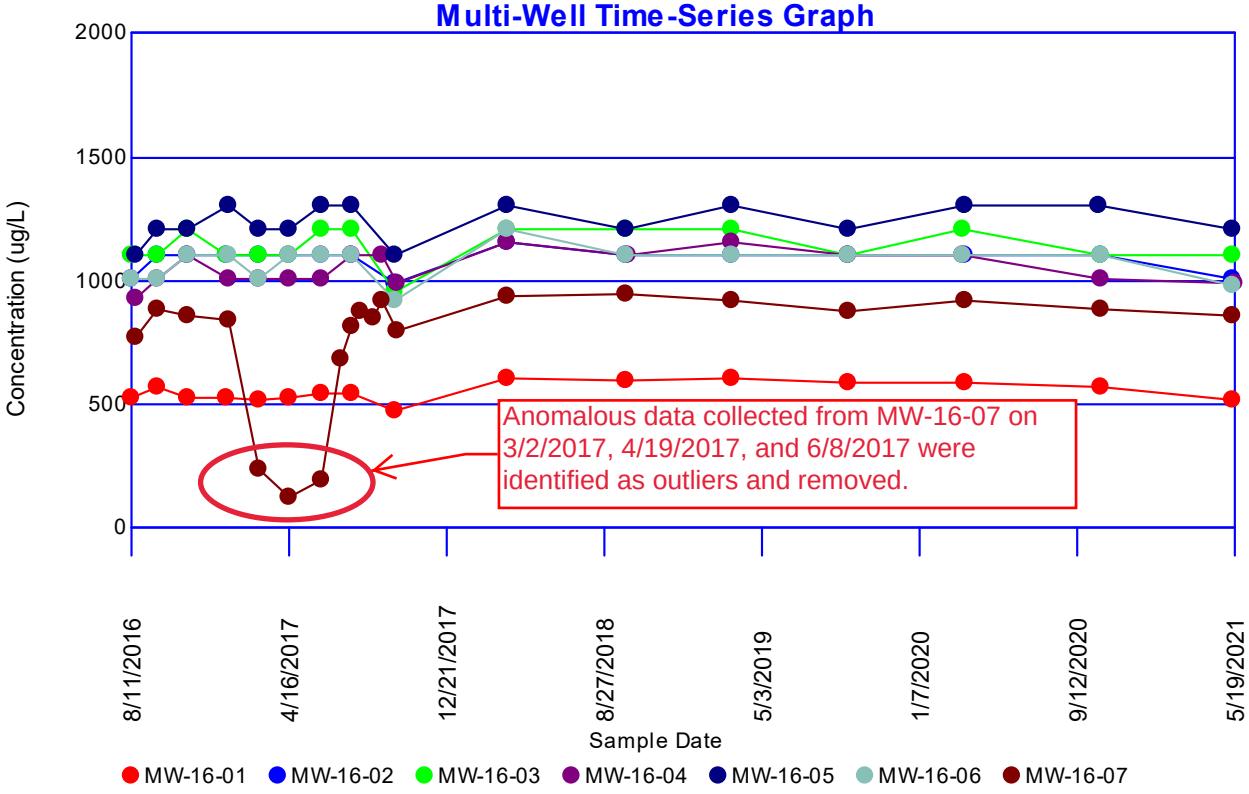


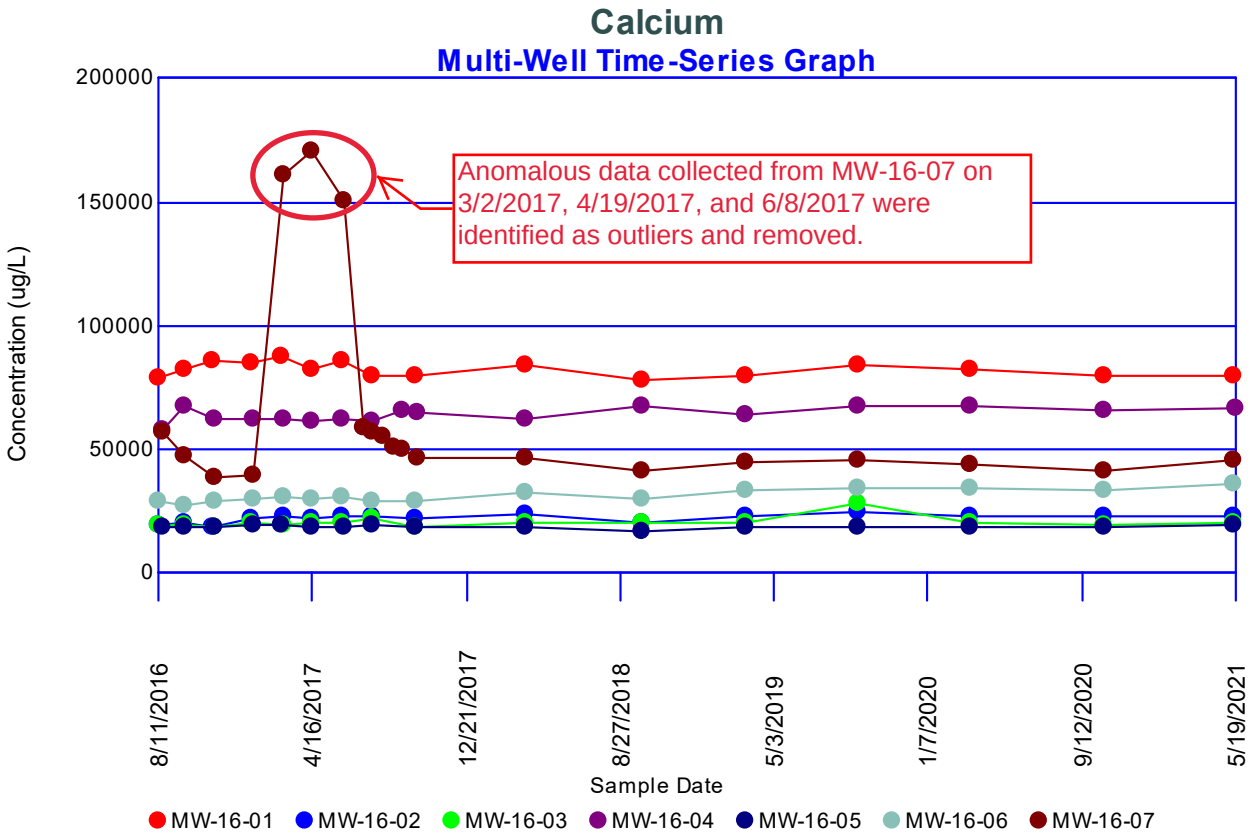
ug/L = micrograms per liter
mg/L = milligrams per liter
SU = standard units

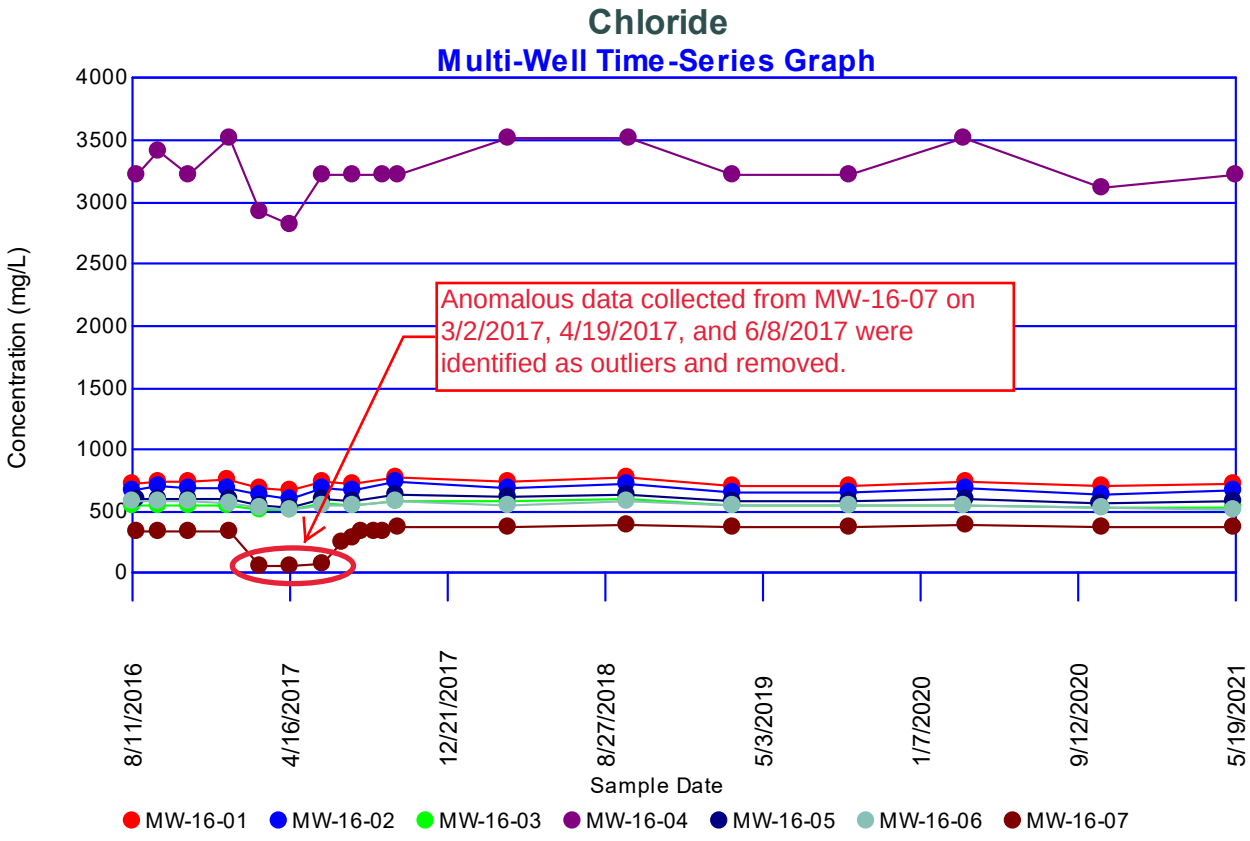
Attachment A
ChemStat™ Prediction Limit Outputs

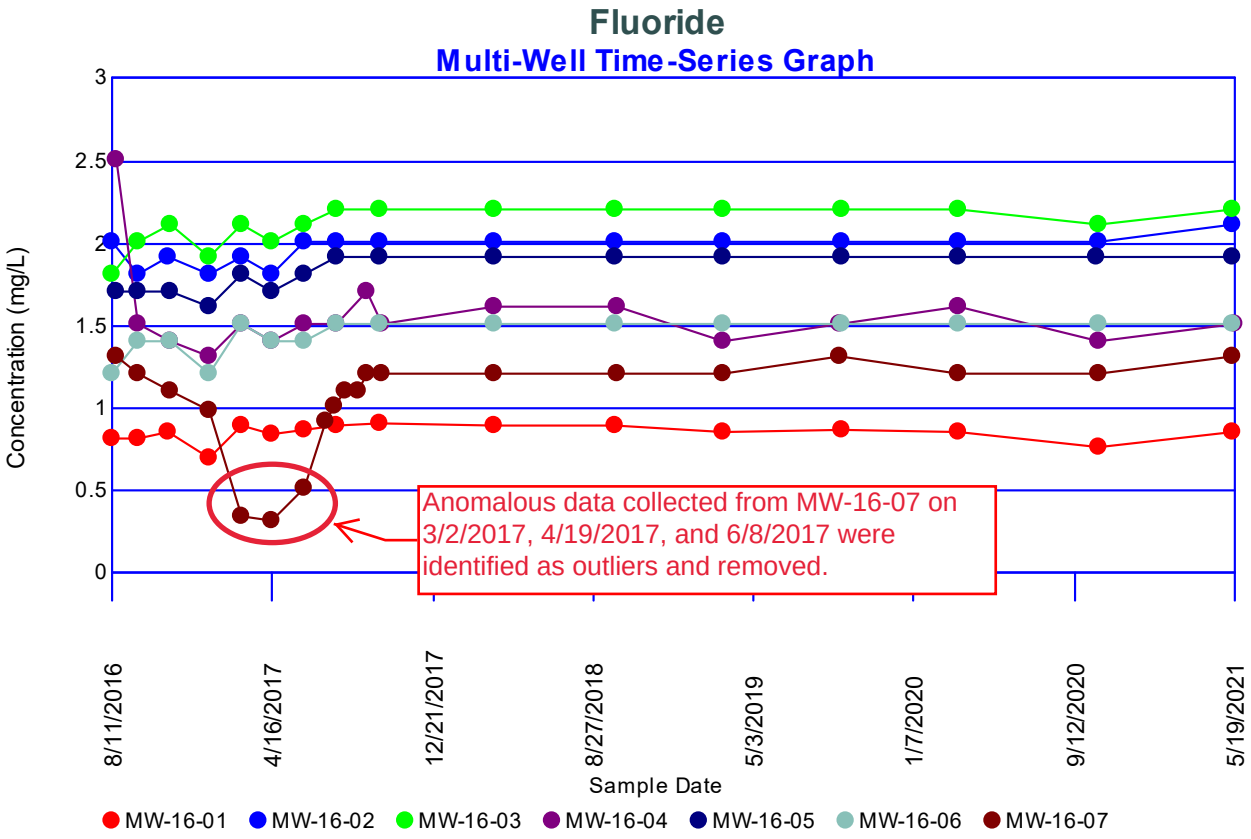
Boron

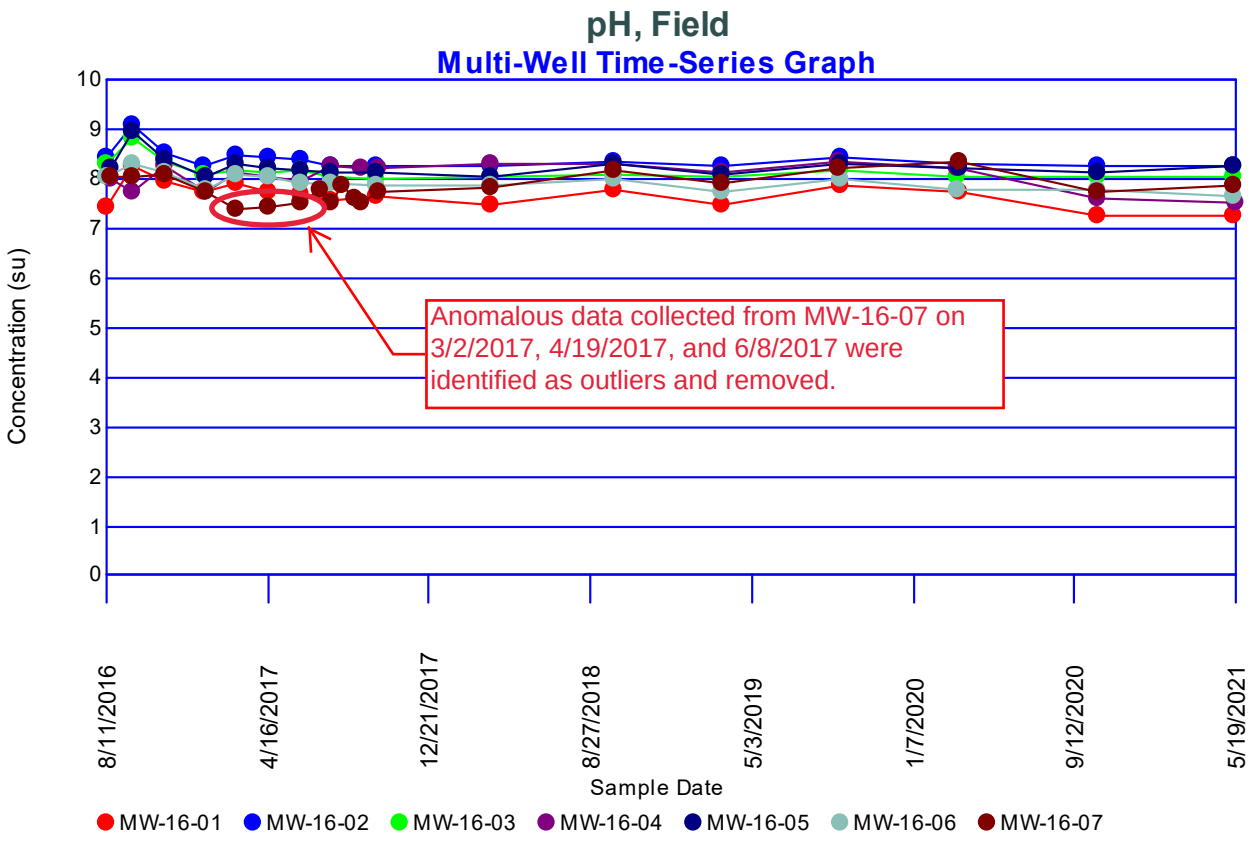
Multi-Well Time-Series Graph

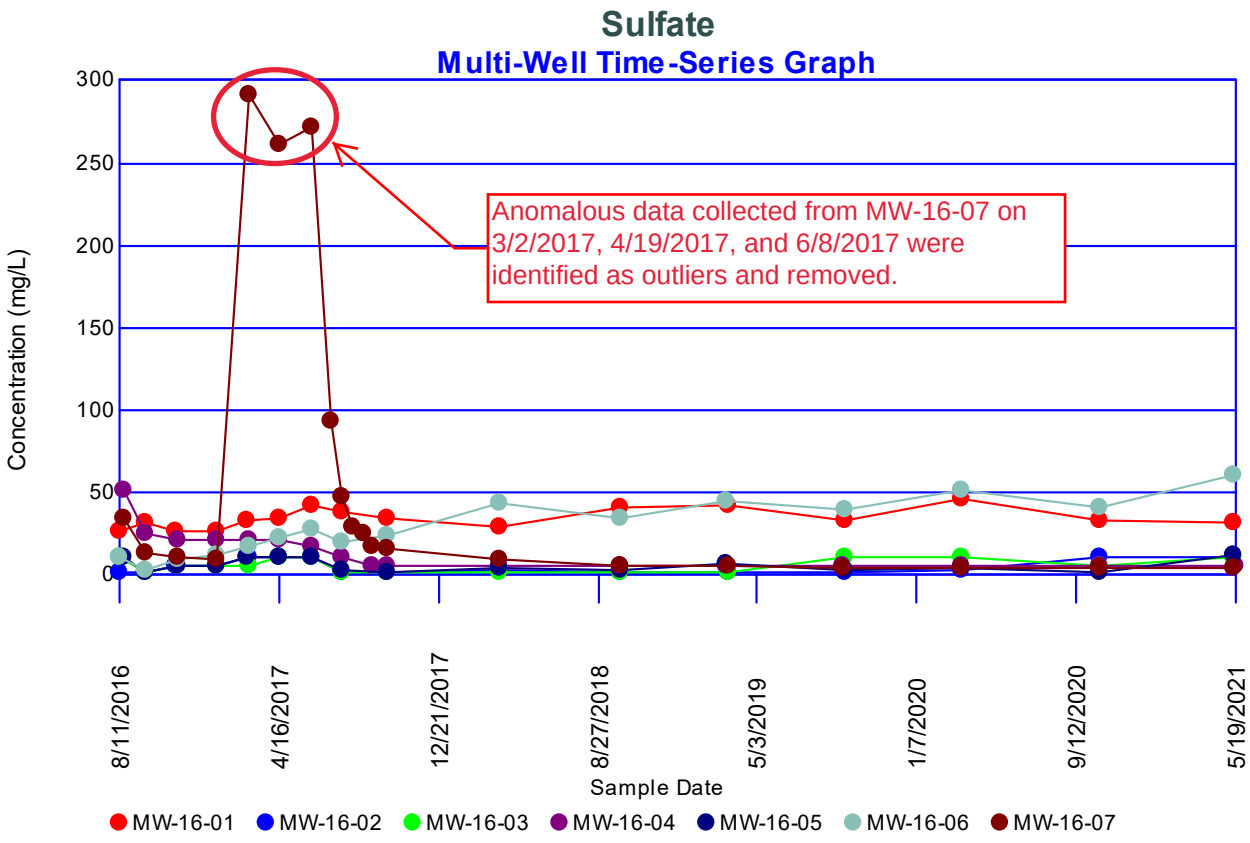


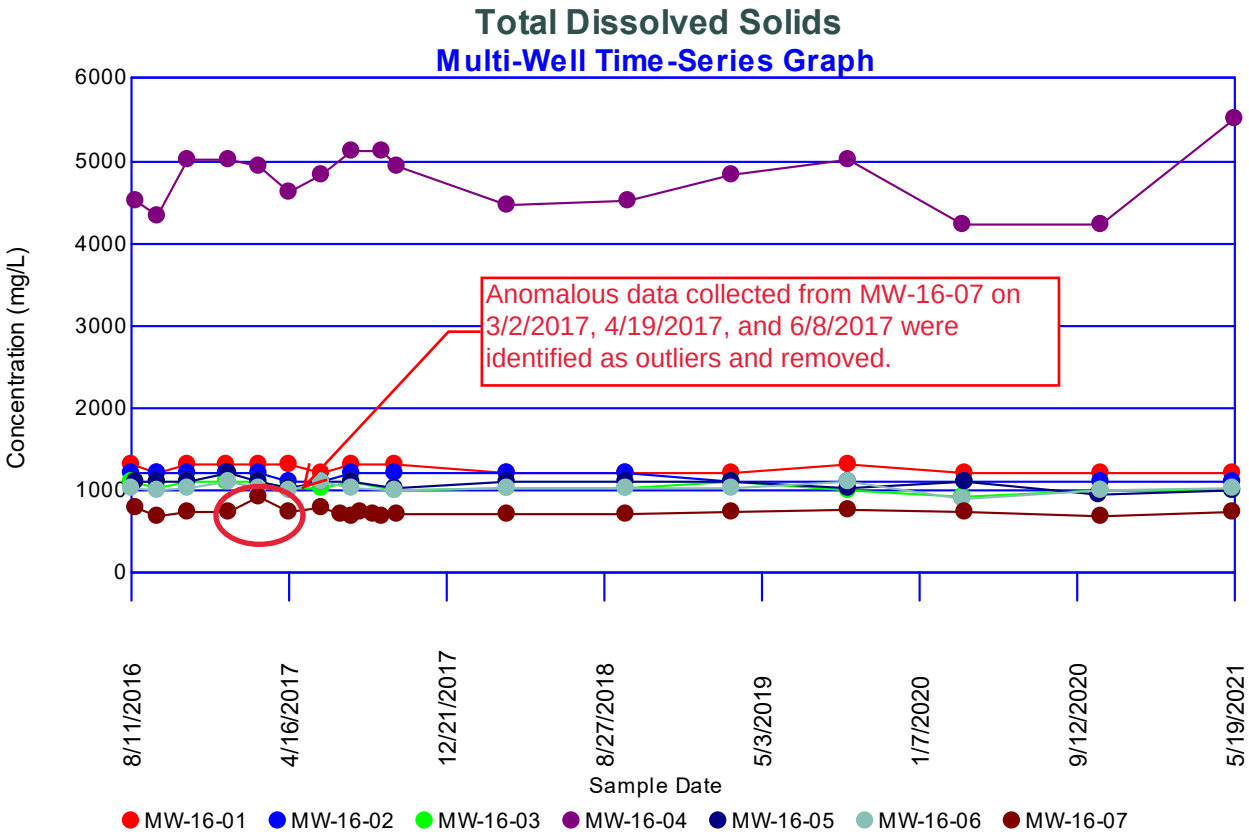

Calcium
Multi-Well Time-Series Graph
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
Concentration (ug/L)
200000
150000
100000
50000
0
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07

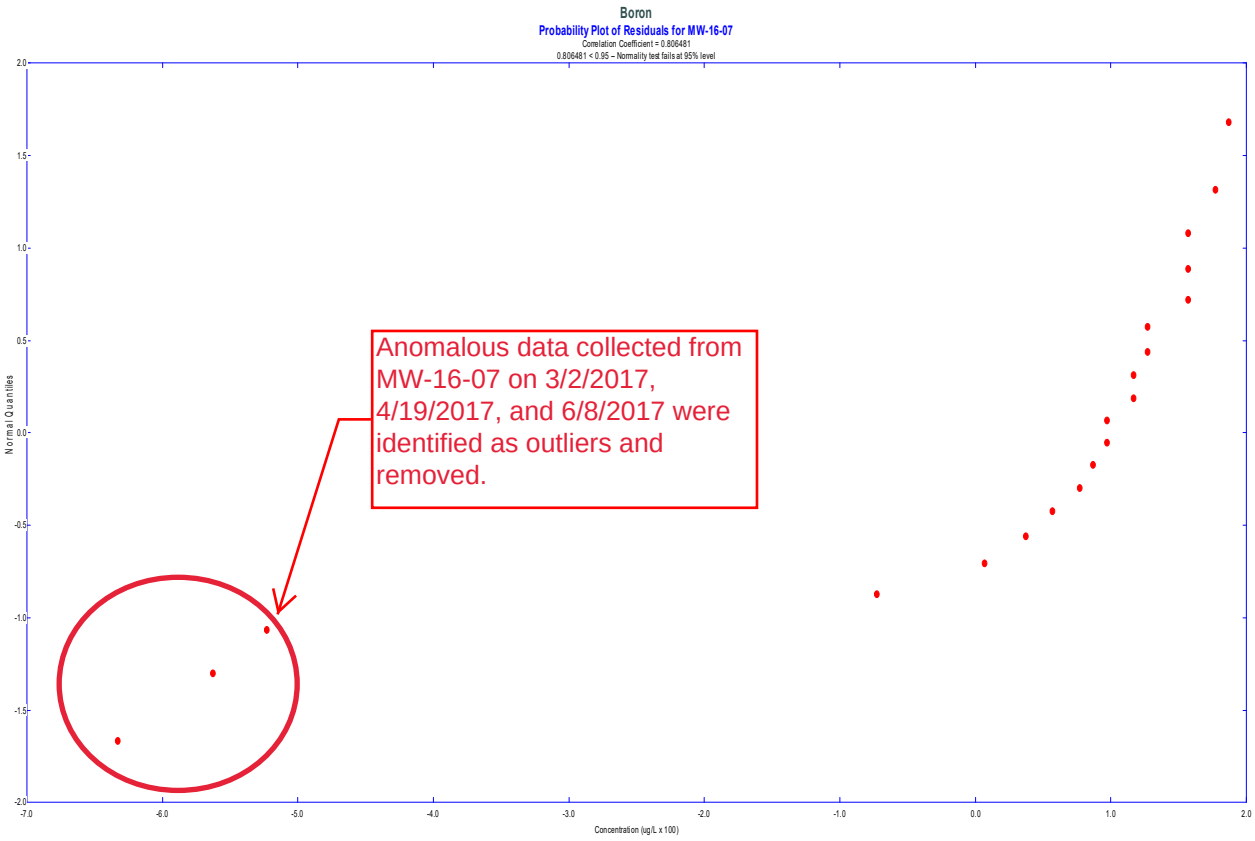

Chloride
Multi-Well Time-Series Graph
Concentration (mg/L)
4000
3500
3000
2500
2000
1500
1000
500
0
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07


Fluoride
Multi-Well Time-Series Graph
Concentration (mg/L)
3
2.5
2
1.5
1
0.5
0
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07

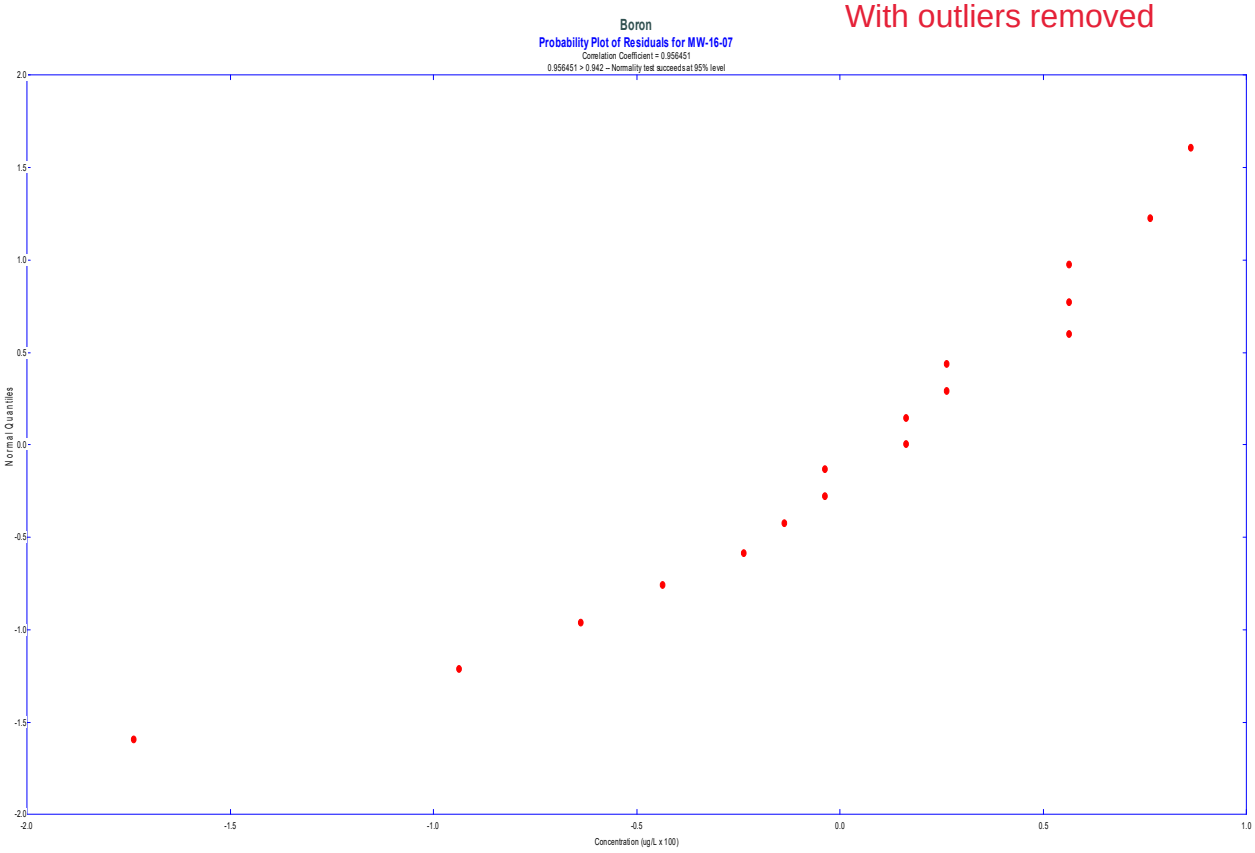

pH, Field
Multi-Well Time-Series Graph
Concentration (su)
10
9
8
7
6
5
4
3
2
1
0
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07

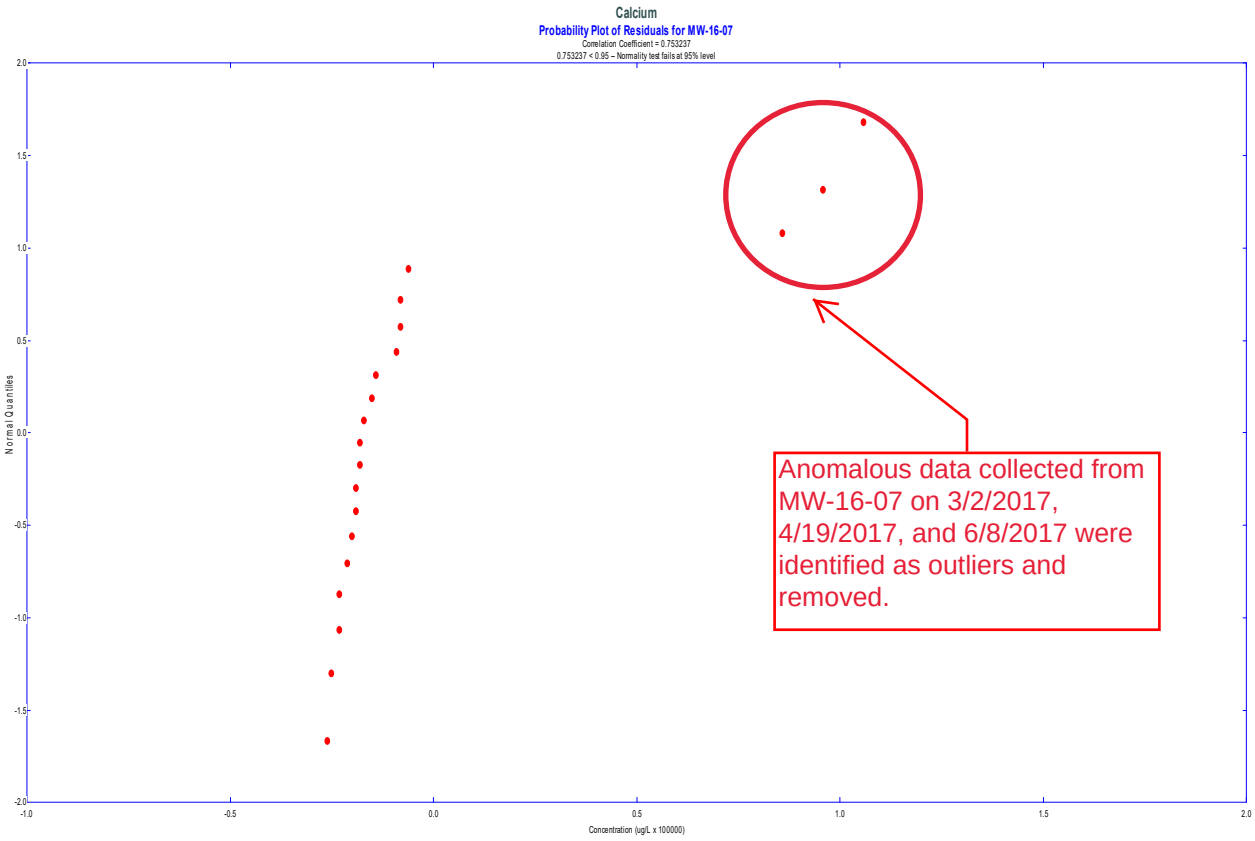

Sulfate
Multi-Well Time-Series Graph
Concentration (mg/L)
300
250
200
150
100
50
0
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07


Total Dissolved Solids
Multi-Well Time-Series Graph
Concentration (mg/L)
6000
5000
4000
3000
2000
1000
0
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
8/11/2016
4/16/2017
12/21/2017
8/27/2018
5/3/2019
1/7/2020
9/12/2020
5/19/2021
Sample Date
MW-16-01
MW-16-02
MW-16-03
MW-16-04
MW-16-05
MW-16-06
MW-16-07

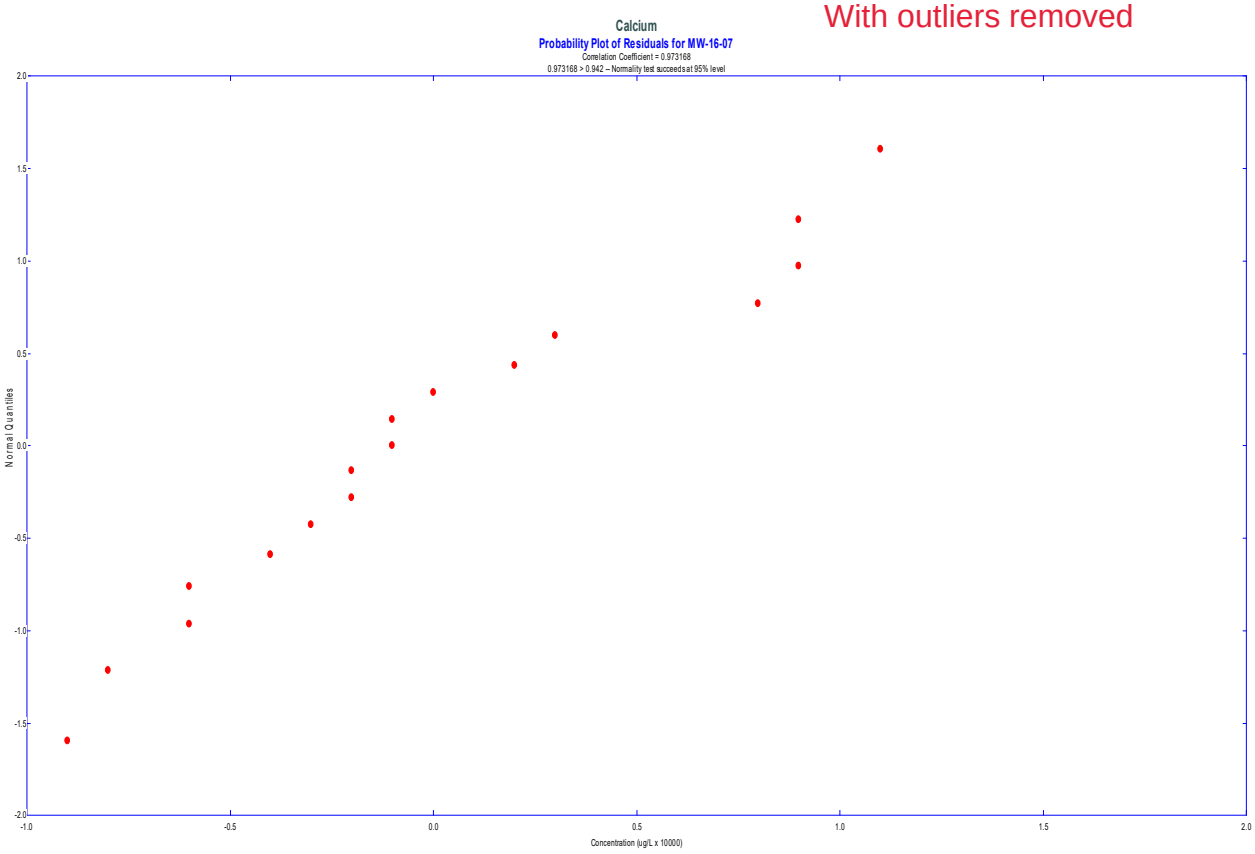

Boron
Probability Plot of Residuals for MW-16-07
Correlation Coefficient = 0.806481
0.806481 < 0.95 – Normality test fails at 95% level
Normal Quantiles
Concentration (ug/L x 100)
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.

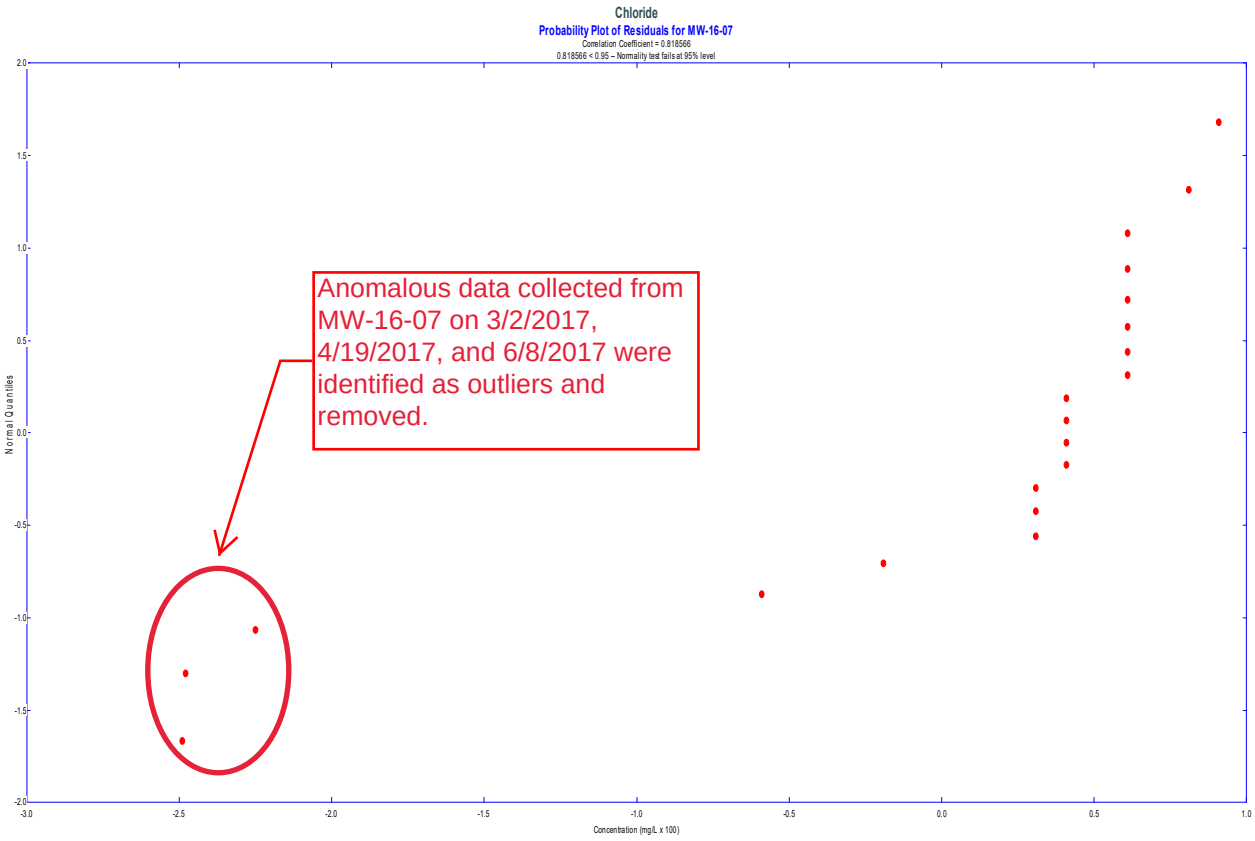
With outliers removed



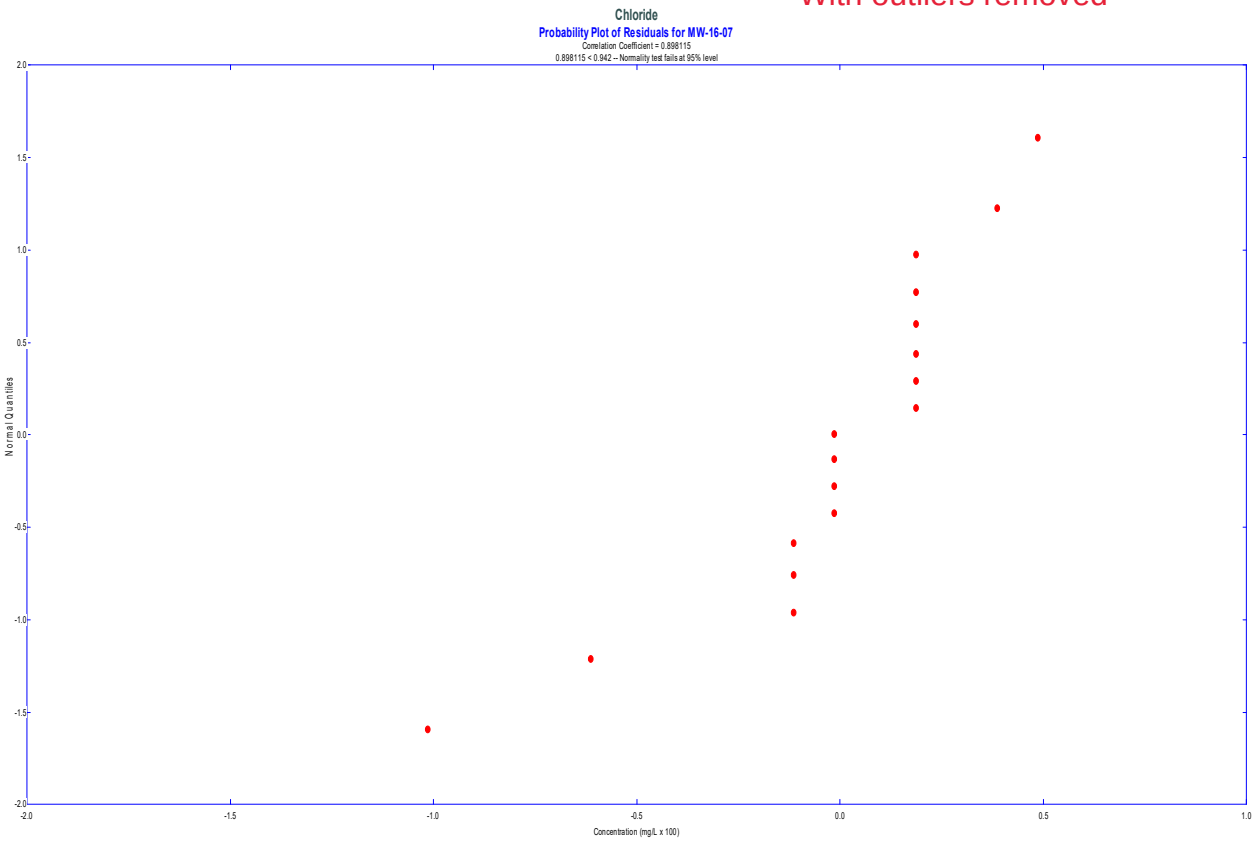

Calcium
Probability Plot of Residuals for MW-16-07
Correlation Coefficient = 0.753237
0.753237 < 0.95 – Normality test fails at 95% level
Normal Quantiles
Concentration (ug/L x 100000)
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.

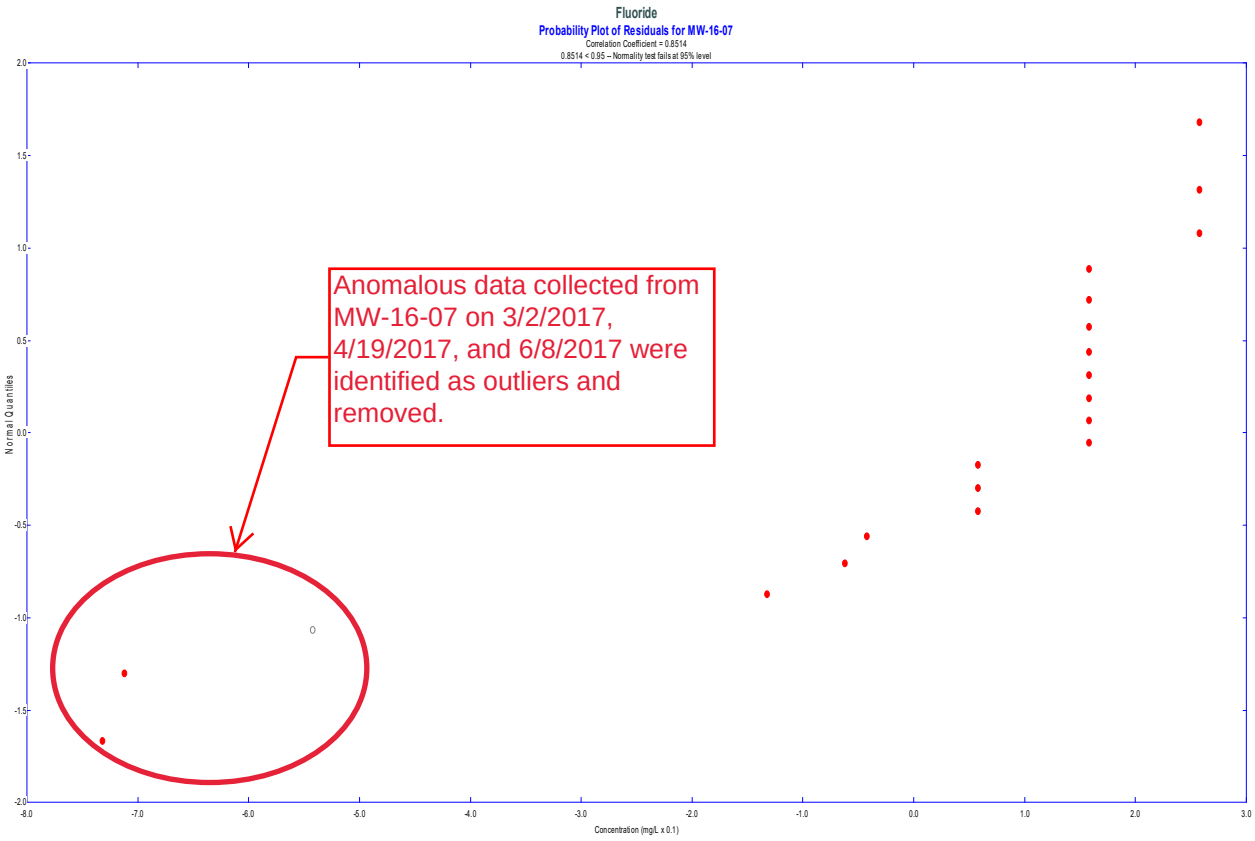
With outliers removed



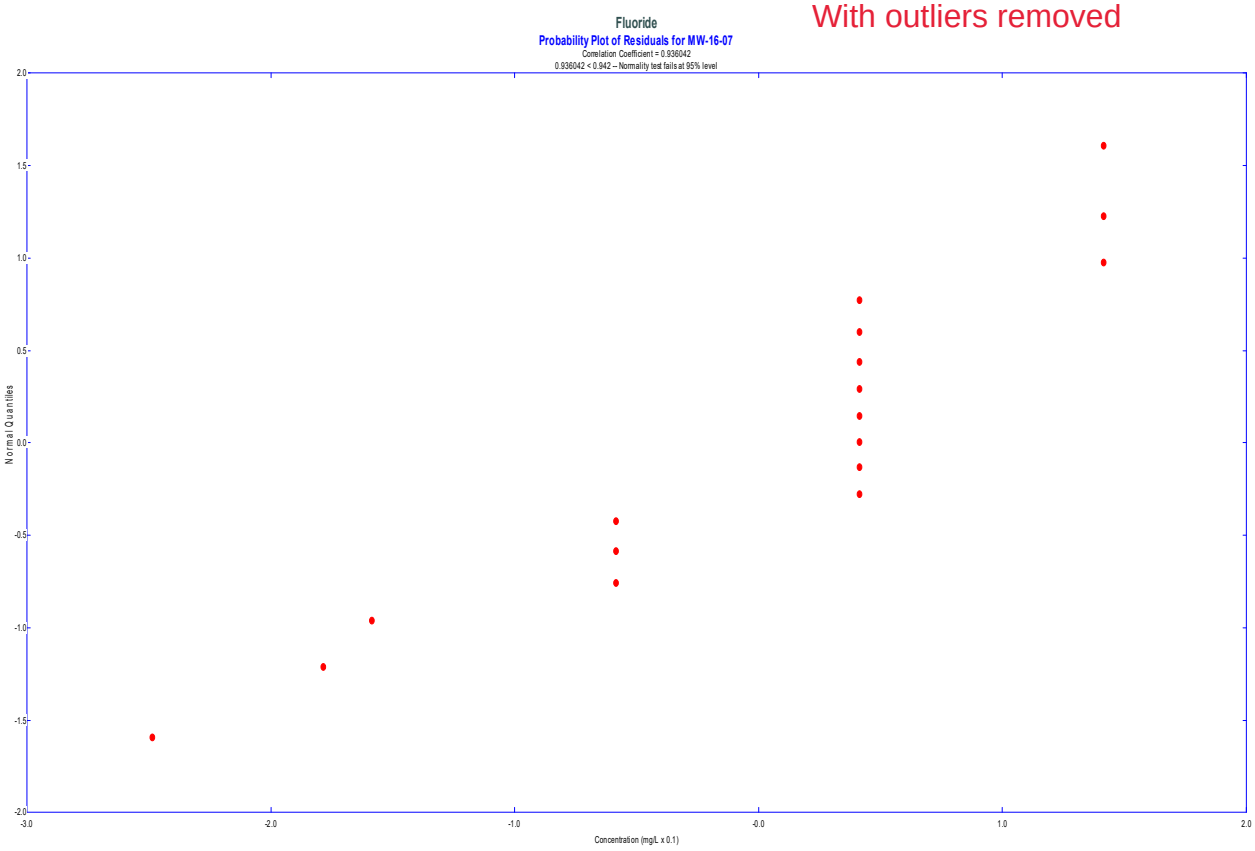

Chloride
Probability Plot of Residuals for MW-16-07
Correlation Coefficient = 0.818566
0.818566 < 0.95 – Normality test fails at 95% level
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
Normal Quantiles
Concentration (mg/L x 100)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-3.0
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0

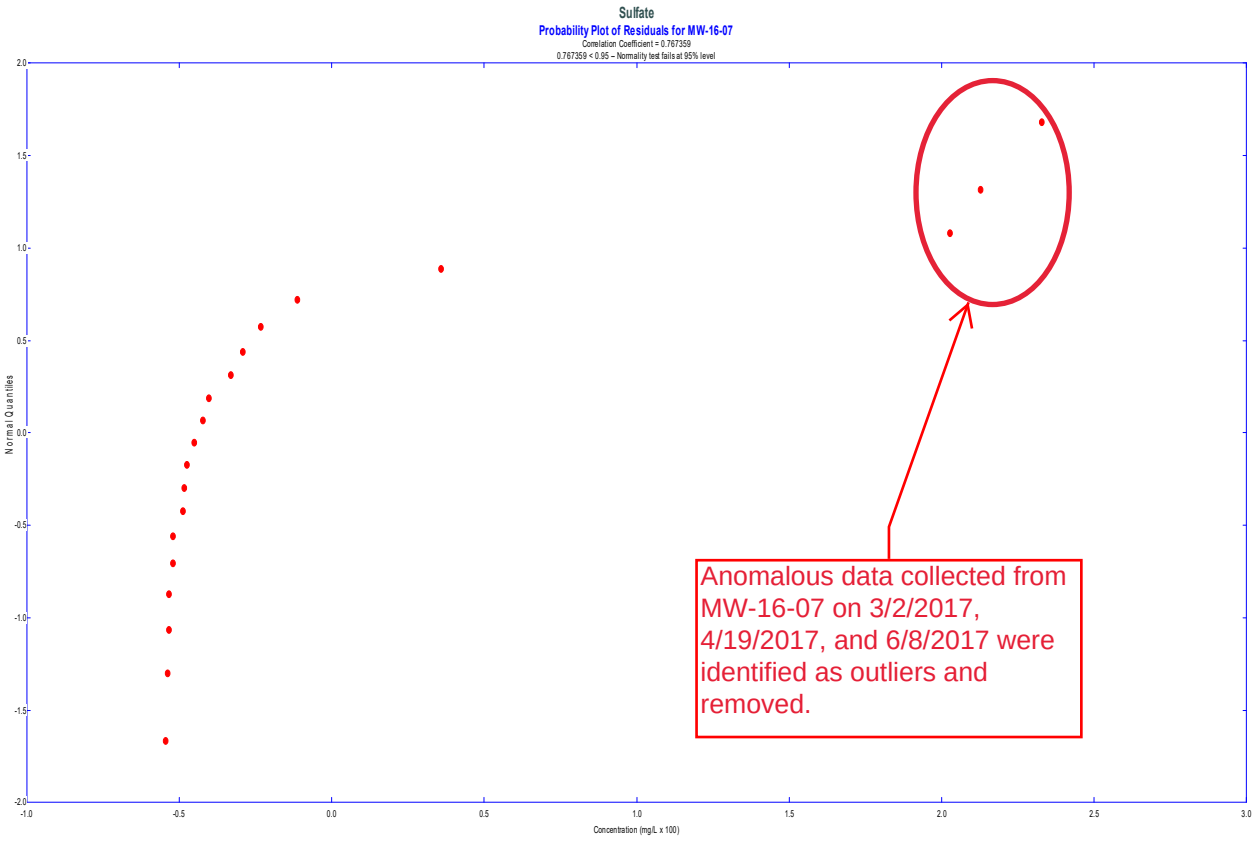
With outliers removed



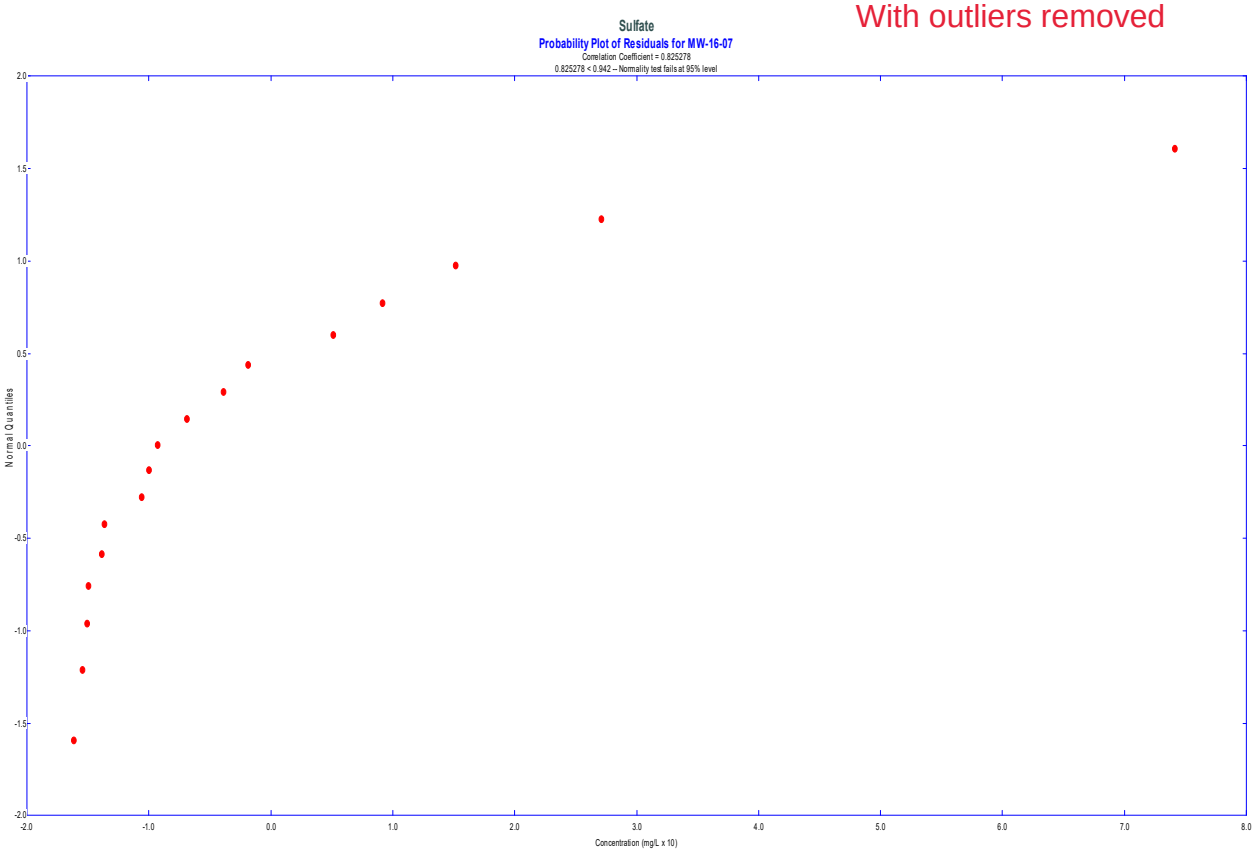

Fluoride
Probability Plot of Residuals for MW-16-07
Correlation Coefficient = 0.8514
0.8514 < 0.95 – Normality test fails at 95% level
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.
Normal Quantiles
Concentration (mg/L x 0.1)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-8.0
-7.0
-6.0
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0

With outliers removed




Sulfate
Probability Plot of Residuals for MW-16-07
Correlation Coefficient = 0.767359
0.767359 < 0.95 – Normality test fails at 95% level
Normal Quantiles
Concentration (mg/L x 100)
Anomalous data collected from MW-16-07 on 3/2/2017, 4/19/2017, and 6/8/2017 were identified as outliers and removed.

With outliers removed



Skewness Coefficient

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	545	37.9473	-0.0680414
MW-16-02	16	1083.13	46.4354	**-1.29879**
MW-16-03	16	1134.38	70.0446	-0.924486
MW-16-04	17	1045.88	69.1067	0.0121214
MW-16-05	16	1231.25	70.4154	-0.485311
MW-16-06	16	1067.5	71.2273	-0.588193
MW-16-07	17	853.529	66.327	**-1.04168**

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	993.596	219.836	-0.974775

Skewness Coefficient

Parameter: Boron

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	6.29849	0.0700671	-0.188243
MW-16-02	16	6.98671	0.0441267	**-1.34788**
MW-16-03	16	7.03197	0.063834	**-1.11867**
MW-16-04	17	6.95056	0.0662376	-0.0637703
MW-16-05	16	7.11422	0.0581173	-0.569059
MW-16-06	16	6.97092	0.0683447	-0.745838
MW-16-07	17	6.74635	0.0815289	**-1.25786**

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	6.87092	0.262934	**-1.35043**

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: MW-16-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	980	1150	170	0.5056	85.952
2	1000	1100	100	0.329	32.9
3	1000	1100	100	0.2521	25.21
4	1100	1100	0	0.1939	0
5	1100	1100	0	0.1447	0
6	1100	1100	0	0.1005	0
7	1100	1100	0	0.0593	0
8	1100	1100	0	0.0196	0
9	1100	1100	0		
10	1100	1100	0		
11	1100	1100	0		
12	1100	1100	0		
13	1100	1100	0		
14	1100	1000	-100		
15	1100	1000	-100		
16	1150	980	-170		

Sum of b values = 144.062

Sample Standard Deviation = 46.4354

W Statistic = 0.641665

5% Critical value of 0.887 exceeds 0.641665

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.641665

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: MW-16-02

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.88755	7.04752	0.159965	0.5056	0.0808781
2	6.90776	7.00307	0.0953102	0.329	0.031357
3	6.90776	7.00307	0.0953102	0.2521	0.0240277
4	7.00307	7.00307	0	0.1939	0
5	7.00307	7.00307	0	0.1447	0
6	7.00307	7.00307	0	0.1005	0
7	7.00307	7.00307	0	0.0593	0
8	7.00307	7.00307	0	0.0196	0
9	7.00307	7.00307	0		
10	7.00307	7.00307	0		
11	7.00307	7.00307	0		
12	7.00307	7.00307	0		
13	7.00307	7.00307	0		
14	7.00307	6.90776	-0.0953102		
15	7.00307	6.90776	-0.0953102		
16	7.04752	6.88755	-0.159965		

Sum of b values = 0.136263

Sample Standard Deviation = 0.0441267

W Statistic = 0.635714

5% Critical value of 0.887 exceeds 0.635714

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.635714

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: MW-16-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 17 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	680	940	260	0.4968	129.168
2	760	930	170	0.3273	55.641
3	790	910	120	0.254	30.48
4	810	910	100	0.1988	19.88
5	830	910	80	0.1524	12.192
6	840	880	40	0.1109	4.436
7	850	880	30	0.0725	2.175
8	850	870	20	0.0359	0.718
9	870	870	0		
10	870	850	-20		
11	880	850	-30		
12	880	840	-40		
13	910	830	-80		
14	910	810	-100		
15	910	790	-120		
16	930	760	-170		
17	940	680	-260		

Sum of b values = 254.69
Sample Standard Deviation = 66.327
W Statistic = 0.92156

5% Critical value of 0.892 is less than 0.92156
Data is normally distributed at 95% level of significance

1% Critical value of 0.851 is less than 0.92156
Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	520
	9/22/2016	560
	11/9/2016	520 B
	1/11/2017	520
	3/1/2017	510
	4/19/2017	520
	6/7/2017	540
	7/26/2017	540
	10/3/2017	470
	3/29/2018 ~	600
	10/3/2018	590
	3/20/2019	600
	9/18/2019	580
	3/19/2020	580
	10/20/2020	560

From 15 baseline samples
Baseline mean = 547.333
Baseline std Dev = 38.0726

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	510	[0, 616.59]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-02

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 1150
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	1000
	9/22/2016	1100
	11/9/2016	1100 B
	1/11/2017	1100
	3/2/2017	1100
	4/19/2017	1100
	6/7/2017	1100
	7/26/2017	1100
	10/3/2017	980
	3/28/2018 ~	1150
	10/3/2018	1100
	3/20/2019	1100
	9/18/2019	1100
	3/19/2020	1100
	10/20/2020	1100

Date	Count	Mean	Significant
5/17/2021	1	1000	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-03

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1100
	9/22/2016	1100
	11/10/2016	1200 B
	1/11/2017	1100
	3/2/2017	1100
	4/19/2017	1100
	6/7/2017	1200
	7/26/2017	1200
	10/3/2017	950
	3/28/2018	1200
	10/3/2018	1200
	3/20/2019	1200
	9/18/2019	1100
	3/18/2020	1200
	10/20/2020	1100

From 15 baseline samples
Baseline mean = 1136.67
Baseline std Dev = 71.8795

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	1100	[0, 1267.42]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	920
	9/23/2016	1000
	11/10/2016	1100 B
	1/12/2017	1000
	3/2/2017	1000
	4/19/2017	1000
	6/7/2017	1000
	7/26/2017	1100
	9/12/2017	1100
	10/5/2017	980
	3/29/2018 ~	1150
	10/5/2018	1100
	3/19/2019 ~	1150
	9/17/2019	1100
	3/18/2020	1100
	10/20/2020	1000

From 16 baseline samples
Baseline mean = 1050
Baseline std Dev = 69.1857

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/19/2021	1	980	[0, 1175.02]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-05

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	1100
	9/22/2016	1200
	11/10/2016	1200 B
	1/12/2017	1300
	3/1/2017	1200
	4/19/2017	1200
	6/8/2017	1300
	7/26/2017	1300
	10/3/2017	1100
	3/29/2018	1300
	10/3/2018	1200
	3/19/2019	1300
	9/19/2019	1200
	3/19/2020	1300
	10/19/2020	1300

From 15 baseline samples
Baseline mean = 1233.33
Baseline std Dev = 72.3747

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/18/2021	1	1200	[0, 1364.99]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1000
	9/23/2016	1000
	11/10/2016	1100 B
	1/12/2017	1100
	3/2/2017	1000
	4/19/2017	1100
	6/7/2017	1100
	7/26/2017	1100
	10/3/2017	910
	3/28/2018	1200
	10/3/2018	1100
	3/19/2019	1100
	9/19/2019	1100
	3/18/2020	1100
	10/20/2020	1100

From 15 baseline samples
Baseline mean = 1074
Baseline std Dev = 68.6398

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	970	[0, 1198.86]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	760
	9/23/2016	880
	11/10/2016	850 B
	1/12/2017	830
	7/10/2017	680 B
	7/25/2017	810
	8/10/2017	870
	8/30/2017	840
	9/12/2017	910
	10/5/2017	790
	3/29/2018	930
	10/4/2018	940
	3/20/2019	910
	9/17/2019	870
	3/19/2020	910
	10/20/2020	880

From 16 baseline samples
Baseline mean = 853.75
Baseline std Dev = 68.4957

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/18/2021	1	850	[0, 977.522]	FALSE

Skewness Coefficient

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	81468.8	2963.49	0.210916
MW-16-02	16	21312.5	1493.04	-0.55517
MW-16-03	16	20031.3	2148.4	**2.75228**
MW-16-04	17	63529.4	2808.86	-0.407028
MW-16-05	16	18125	718.795	**-1.28621**
MW-16-06	16	30406.3	2615.46	0.470455
MW-16-07	17	47000	6184.66	0.423203

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	40530.7	23024.9	0.648155

Skewness Coefficient

Parameter: Calcium

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	11.3074	0.0362732	0.167474
MW-16-02	16	9.96467	0.0718039	-0.737549
MW-16-03	16	9.90045	0.0953488	**2.44456**
MW-16-04	17	11.0583	0.0446945	-0.513296
MW-16-05	16	9.80428	0.0407919	**-1.4875**
MW-16-06	16	10.319	0.0847012	0.404542
MW-16-07	17	10.7499	0.129682	0.246185

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	10.4515	0.562819	0.266144

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: MW-16-03

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	18000	27500	9500	0.5056	4803.2
2	18000	21000	3000	0.329	987
3	19000	20000	1000	0.2521	252.1
4	19000	20000	1000	0.1939	193.9
5	19000	20000	1000	0.1447	144.7
6	19000	20000	1000	0.1005	100.5
7	20000	20000	0	0.0593	0
8	20000	20000	0	0.0196	0
9	20000	20000	0		
10	20000	20000	0		
11	20000	19000	-1000		
12	20000	19000	-1000		
13	20000	19000	-1000		
14	20000	19000	-1000		
15	21000	18000	-3000		
16	27500	18000	-9500		

Sum of b values = 6481.4

Sample Standard Deviation = 2148.4

W Statistic = 0.606759

5% Critical value of 0.887 exceeds 0.606759

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.606759

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: MW-16-03

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	9.79813	10.2219	0.423814	0.5056	0.21428
2	9.79813	9.95228	0.154151	0.329	0.0507156
3	9.85219	9.90349	0.0512933	0.2521	0.012931
4	9.85219	9.90349	0.0512933	0.1939	0.00994577
5	9.85219	9.90349	0.0512933	0.1447	0.00742214
6	9.85219	9.90349	0.0512933	0.1005	0.00515498
7	9.90349	9.90349	0	0.0593	0
8	9.90349	9.90349	0	0.0196	0
9	9.90349	9.90349	0		
10	9.90349	9.90349	0		
11	9.90349	9.85219	-0.0512933		
12	9.90349	9.85219	-0.0512933		
13	9.90349	9.85219	-0.0512933		
14	9.90349	9.85219	-0.0512933		
15	9.95228	9.79813	-0.154151		
16	10.2219	9.79813	-0.423814		

Sum of b values = 0.30045

Sample Standard Deviation = 0.0953488

W Statistic = 0.661946

5% Critical value of 0.887 exceeds 0.661946

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.661946

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: MW-16-05

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	16000	19000	3000	0.5056	1516.8
2	18000	19000	1000	0.329	329
3	18000	19000	1000	0.2521	252.1
4	18000	19000	1000	0.1939	193.9
5	18000	18000	0	0.1447	0
6	18000	18000	0	0.1005	0
7	18000	18000	0	0.0593	0
8	18000	18000	0	0.0196	0
9	18000	18000	0		
10	18000	18000	0		
11	18000	18000	0		
12	18000	18000	0		
13	19000	18000	-1000		
14	19000	18000	-1000		
15	19000	18000	-1000		
16	19000	16000	-3000		

Sum of b values = 2291.8

Sample Standard Deviation = 718.795

W Statistic = 0.677722

5% Critical value of 0.887 exceeds 0.677722

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.677722

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: MW-16-05

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	9.68034	9.85219	0.17185	0.5056	0.0868875
2	9.79813	9.85219	0.0540672	0.329	0.0177881
3	9.79813	9.85219	0.0540672	0.2521	0.0136303
4	9.79813	9.85219	0.0540672	0.1939	0.0104836
5	9.79813	9.79813	0	0.1447	0
6	9.79813	9.79813	0	0.1005	0
7	9.79813	9.79813	0	0.0593	0
8	9.79813	9.79813	0	0.0196	0
9	9.79813	9.79813	0		
10	9.79813	9.79813	0		
11	9.79813	9.79813	0		
12	9.79813	9.79813	0		
13	9.85219	9.79813	-0.0540672		
14	9.85219	9.79813	-0.0540672		
15	9.85219	9.79813	-0.0540672		
16	9.85219	9.68034	-0.17185		

Sum of b values = 0.12879

Sample Standard Deviation = 0.0407919

W Statistic = 0.664542

5% Critical value of 0.887 exceeds 0.664542

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.664542

Evidence of non-normality at 99% level of significance

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	78000
	9/22/2016	82000
	11/9/2016	85000
	1/11/2017	84000
	3/1/2017	87000
	4/19/2017	82000
	6/7/2017	85000
	7/26/2017	79000
	10/3/2017	79000
	3/29/2018	83000
	10/3/2018	77000
	3/20/2019	79000
	9/18/2019 ~	83500
	3/19/2020	82000
	10/20/2020	79000

From 15 baseline samples
Baseline mean = 81633.3
Baseline std Dev = 2990.86

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	79000	[0, 87073.9]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-02

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	19000
	9/22/2016	20000
	11/9/2016	18000
	1/11/2017	21000
	3/2/2017	22000
	4/19/2017	21000
	6/7/2017	22000
	7/26/2017	22000
	10/3/2017	21000
	3/28/2018	23000
	10/3/2018	20000 F1
	3/20/2019	22000
	9/18/2019 ~	24000
	3/19/2020	22000
	10/20/2020	22000

From 15 baseline samples
Baseline mean = 21266.7
Baseline std Dev = 1533.75

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	22000	[0, 24056.7]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-03

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 27500
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	19000
	9/22/2016	19000
	11/10/2016	18000
	1/11/2017	20000
	3/2/2017	19000
	4/19/2017	20000
	6/7/2017	20000
	7/26/2017	21000
	10/3/2017	18000
	3/28/2018	20000
	10/3/2018	20000
	3/20/2019	20000
	9/18/2019 ~	27500
	3/18/2020	20000
	10/20/2020	19000

Date	Count	Mean	Significant
5/17/2021	1	20000	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	57000
	9/23/2016	67000
	11/10/2016	62000
	1/12/2017	62000
	3/2/2017	62000
	4/19/2017	61000
	6/7/2017	62000
	7/26/2017	61000
	9/12/2017	65000
	10/5/2017	64000
	3/29/2018	62000
	10/5/2018 ~	67000
	3/19/2019	63000
	9/17/2019 ~	67000
	3/18/2020	67000
	10/20/2020	65000

From 16 baseline samples
Baseline mean = 63375
Baseline std Dev = 2825.48

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/19/2021	1	66000	[0, 68480.7]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-05

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 19000
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/19/2016	18000
	9/22/2016	18000
	11/10/2016	18000
	1/12/2017	19000
	3/1/2017	19000
	4/19/2017	18000
	6/8/2017	18000
	7/26/2017	19000
	10/3/2017	18000
	3/29/2018	18000
	10/3/2018	16000
	3/19/2019	18000
	9/19/2019	18000
	3/19/2020	18000
	10/19/2020	18000

Date	Count	Mean	Significant
5/18/2021	1	19000	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	28000
	9/23/2016	27000
	11/10/2016	28000
	1/12/2017	29000
	3/2/2017	30000
	4/19/2017	29000
	6/7/2017	30000
	7/26/2017	28000
	10/3/2017	28000
	3/28/2018 ~	31500
	10/3/2018	29000
	3/19/2019 ~	33000
	9/19/2019	34000
	3/18/2020	34000
	10/20/2020	33000

From 15 baseline samples
Baseline mean = 30100
Baseline std Dev = 2391.95

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	35000	[0, 34451.1]	TRUE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	56000
	9/23/2016	47000
	11/10/2016	38000
	1/12/2017	39000
	7/10/2017	58000
	7/25/2017	56000
	8/10/2017	55000
	8/30/2017	50000
	9/12/2017	49000
	10/5/2017	46000
	3/29/2018	46000
	10/4/2018	41000
	3/20/2019	44000
	9/17/2019	45000
	3/19/2020	43000
	10/20/2020	41000

From 16 baseline samples
Baseline mean = 47125
Baseline std Dev = 6365.27

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/18/2021	1	45000	[0, 58627.1]	FALSE

Skewness Coefficient

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	711.875	29.9374	-0.21742
MW-16-02	16	656.875	35.1603	-0.206976
MW-16-03	16	536.563	23.5739	-0.0289627
MW-16-04	17	3235.29	199.816	-0.358438
MW-16-05	16	575.313	27.4146	-0.0223709
MW-16-06	16	536.875	24.6897	-0.369595
MW-16-07	17	331.176	35.6865	**-1.49399**

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	955.351	968.551	**1.93391**

Skewness Coefficient

Parameter: Chloride

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	6.56707	0.042318	-0.317154
MW-16-02	16	6.48614	0.0539986	-0.362477
MW-16-03	16	6.28428	0.0440598	-0.152941
MW-16-04	17	8.08004	0.0627027	-0.523481
MW-16-05	16	6.35385	0.047794	-0.146694
MW-16-06	16	6.28476	0.0464439	-0.435556
MW-16-07	17	5.79642	0.119133	**-1.82389**

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	6.55717	0.68384	**1.42879**

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: MW-16-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 17 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	230	380	150	0.4968	74.52
2	270	370	100	0.3273	32.73
3	320	350	30	0.254	7.62
4	320	350	30	0.1988	5.964
5	320	350	30	0.1524	4.572
6	330	350	20	0.1109	2.218
7	330	350	20	0.0725	1.45
8	330	350	20	0.0359	0.718
9	330	330	0		
10	350	330	-20		
11	350	330	-20		
12	350	330	-20		
13	350	320	-30		
14	350	320	-30		
15	350	320	-30		
16	370	270	-100		
17	380	230	-150		

Sum of b values = 129.792

Sample Standard Deviation = 35.6865

W Statistic = 0.826736

5% Critical value of 0.892 exceeds 0.826736

Evidence of non-normality at 95% level of significance

1% Critical value of 0.851 exceeds 0.826736

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: MW-16-07

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 17 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5.43808	5.94017	0.502092	0.4968	0.249439
2	5.59842	5.9135	0.315081	0.3273	0.103126
3	5.76832	5.85793	0.0896122	0.254	0.0227615
4	5.76832	5.85793	0.0896122	0.1988	0.0178149
5	5.76832	5.85793	0.0896122	0.1524	0.0136569
6	5.79909	5.85793	0.0588405	0.1109	0.00652541
7	5.79909	5.85793	0.0588405	0.0725	0.00426594
8	5.79909	5.85793	0.0588405	0.0359	0.00211237
9	5.79909	5.79909	0		
10	5.85793	5.79909	-0.0588405		
11	5.85793	5.79909	-0.0588405		
12	5.85793	5.79909	-0.0588405		
13	5.85793	5.76832	-0.0896122		
14	5.85793	5.76832	-0.0896122		
15	5.85793	5.76832	-0.0896122		
16	5.9135	5.59842	-0.315081		
17	5.94017	5.43808	-0.502092		

Sum of b values = 0.419702

Sample Standard Deviation = 0.119133

W Statistic = 0.775702

5% Critical value of 0.892 exceeds 0.775702

Evidence of non-normality at 95% level of significance

1% Critical value of 0.851 exceeds 0.775702

Evidence of non-normality at 99% level of significance

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	710
	9/22/2016	730
	11/9/2016	730
	1/11/2017	740
	3/1/2017	670
	4/19/2017	650
	6/7/2017	720 F2
	7/26/2017	710
	10/3/2017	760
	3/29/2018	720
	10/3/2018	760
	3/20/2019	690
	9/18/2019	690
	3/19/2020	720
	10/20/2020	690

From 15 baseline samples
Baseline mean = 712.667
Baseline std Dev = 30.8143

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	700	[0, 768.72]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-02

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	650
	9/22/2016	690
	11/9/2016	670
	1/11/2017	670
	3/2/2017	620
	4/19/2017	580
	6/7/2017	670
	7/26/2017	650
	10/3/2017	720
	3/28/2018	670
	10/3/2018	710
	3/20/2019	640
	9/18/2019	630
	3/19/2020	670
	10/20/2020	620

From 15 baseline samples
Baseline mean = 657.333
Baseline std Dev = 36.3449

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	650	[0, 723.447]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-03

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	540
	9/22/2016	540
	11/10/2016	540
	1/11/2017	540
	3/2/2017	500
	4/19/2017	490
	6/7/2017	550
	7/26/2017	530
	10/3/2017 ~	575
	3/28/2018	560
	10/3/2018	580
	3/20/2019	530
	9/18/2019	530
	3/18/2020	540
	10/20/2020	520

From 15 baseline samples
Baseline mean = 537.667
Baseline std Dev = 23.9692

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	520	[0, 581.268]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	3200
	9/23/2016	3400
	11/10/2016	3200
	1/12/2017	3500
	3/2/2017	2900
	4/19/2017	2800
	6/7/2017	3200
	7/26/2017	3200
	9/12/2017	3200
	10/5/2017	3200
	3/29/2018	3500
	10/5/2018	3500
	3/19/2019	3200
	9/17/2019	3200
	3/18/2020	3500
	10/20/2020	3100

From 16 baseline samples
Baseline mean = 3237.5
Baseline std Dev = 206.155

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/19/2021	1	3200	[0, 3610.02]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-05

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	590
	9/22/2016	590
	11/10/2016	580
	1/12/2017	580
	3/1/2017	540
	4/19/2017	520
	6/8/2017	580 F2
	7/26/2017	560
	10/3/2017	620
	3/29/2018	600
	10/3/2018 ~	625
	3/19/2019	570
	9/19/2019	560
	3/19/2020	580
	10/19/2020	550

From 15 baseline samples
Baseline mean = 576.333
Baseline std Dev = 28.0603

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/18/2021	1	560	[0, 627.377]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	560
	9/23/2016	560
	11/10/2016	560
	1/12/2017	550
	3/2/2017	510
	4/19/2017	490
	6/7/2017	540
	7/26/2017	540
	10/3/2017 ~	570
	3/28/2018	540
	10/3/2018	570
	3/19/2019	530
	9/19/2019	530
	3/18/2020	530
	10/20/2020	510

From 15 baseline samples
Baseline mean = 539.333
Baseline std Dev = 23.4419

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	500	[0, 581.976]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-07

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 380
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/19/2016	320
	9/23/2016	320
	11/10/2016	330
	1/12/2017	330
	7/10/2017	230
	7/25/2017	270
	8/10/2017	320
	8/30/2017	330
	9/12/2017	330
	10/5/2017 ~	350
	3/29/2018	350
	10/4/2018	380
	3/20/2019	350
	9/17/2019	350
	3/19/2020	370

Date	Count	Mean	Significant
5/18/2021	1	350	FALSE

Skewness Coefficient

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	0.83875	0.0543906	**-1.47268**
MW-16-02	16	1.95625	0.0892095	-0.775096
MW-16-03	16	2.10625	0.123659	**-1.21268**
MW-16-04	17	1.47941	0.113273	-0.168294
MW-16-05	16	1.81875	0.104682	-0.741358
MW-16-06	16	1.4375	0.10247	**-1.57185**
MW-16-07	17	1.15824	0.112596	-0.739376

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	1.53825	0.429495	-0.202644

Skewness Coefficient

Parameter: Fluoride

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	-0.177956	0.0683629	**-1.62785**
MW-16-02	16	0.67003	0.0464718	-0.835776
MW-16-03	16	0.743209	0.0610066	**-1.30559**
MW-16-04	17	0.388841	0.0775493	-0.367494
MW-16-05	16	0.596548	0.058891	-0.787719
MW-16-06	16	0.360324	0.0757287	**-1.65111**
MW-16-07	17	0.142181	0.10165	-0.917988

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	0.386858	0.307854	-0.629819

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.69	0.9	0.21	0.5056	0.106176
2	0.75	0.89	0.14	0.329	0.04606
3	0.81	0.88	0.07	0.2521	0.017647
4	0.81	0.88	0.07	0.1939	0.013573
5	0.83	0.88	0.05	0.1447	0.007235
6	0.84	0.86	0.02	0.1005	0.00201
7	0.84	0.86	0.02	0.0593	0.001186
8	0.85	0.85	0	0.0196	0
9	0.85	0.85	0		
10	0.86	0.84	-0.02		
11	0.86	0.84	-0.02		
12	0.88	0.83	-0.05		
13	0.88	0.81	-0.07		
14	0.88	0.81	-0.07		
15	0.89	0.75	-0.14		
16	0.9	0.69	-0.21		

Sum of b values = 0.193887
Sample Standard Deviation = 0.0543906
W Statistic = 0.847147

5% Critical value of 0.887 exceeds 0.847147
Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.847147
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-01

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	-0.371064	-0.105361	0.265703	0.5056	0.13434
2	-0.287682	-0.116534	0.171148	0.329	0.0563078
3	-0.210721	-0.127833	0.0828877	0.2521	0.020896
4	-0.210721	-0.127833	0.0828877	0.1939	0.0160719
5	-0.18633	-0.127833	0.0584962	0.1447	0.0084644
6	-0.174353	-0.150823	0.0235305	0.1005	0.00236481
7	-0.174353	-0.150823	0.0235305	0.0593	0.00139536
8	-0.162519	-0.162519	0	0.0196	0
9	-0.162519	-0.162519	0		
10	-0.150823	-0.174353	-0.0235305		
11	-0.150823	-0.174353	-0.0235305		
12	-0.127833	-0.18633	-0.0584962		
13	-0.127833	-0.210721	-0.0828877		
14	-0.127833	-0.210721	-0.0828877		
15	-0.116534	-0.287682	-0.171148		
16	-0.105361	-0.371064	-0.265703		

Sum of b values = 0.23984

Sample Standard Deviation = 0.0683629

W Statistic = 0.820561

5% Critical value of 0.887 exceeds 0.820561

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.820561

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-03

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.8	2.2	0.4	0.5056	0.20224
2	1.9	2.2	0.3	0.329	0.0987
3	2	2.2	0.2	0.2521	0.05042
4	2	2.2	0.2	0.1939	0.03878
5	2.1	2.2	0.1	0.1447	0.01447
6	2.1	2.2	0.1	0.1005	0.01005
7	2.1	2.2	0.1	0.0593	0.00593
8	2.1	2.2	0.1	0.0196	0.00196
9	2.2	2.1	-0.1		
10	2.2	2.1	-0.1		
11	2.2	2.1	-0.1		
12	2.2	2.1	-0.1		
13	2.2	2	-0.2		
14	2.2	2	-0.2		
15	2.2	1.9	-0.3		
16	2.2	1.8	-0.4		

Sum of b values = 0.42255
Sample Standard Deviation = 0.123659
W Statistic = 0.778413

5% Critical value of 0.887 exceeds 0.778413
Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.778413
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-03

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.587787	0.788457	0.200671	0.5056	0.101459
2	0.641854	0.788457	0.146603	0.329	0.0482325
3	0.693147	0.788457	0.0953102	0.2521	0.0240277
4	0.693147	0.788457	0.0953102	0.1939	0.0184806
5	0.741937	0.788457	0.04652	0.1447	0.00673145
6	0.741937	0.788457	0.04652	0.1005	0.00467526
7	0.741937	0.788457	0.04652	0.0593	0.00275864
8	0.741937	0.788457	0.04652	0.0196	0.000911792
9	0.788457	0.741937	-0.04652		
10	0.788457	0.741937	-0.04652		
11	0.788457	0.741937	-0.04652		
12	0.788457	0.741937	-0.04652		
13	0.788457	0.693147	-0.0953102		
14	0.788457	0.693147	-0.0953102		
15	0.788457	0.641854	-0.146603		
16	0.788457	0.587787	-0.200671		

Sum of b values = 0.207277
Sample Standard Deviation = 0.0610066
W Statistic = 0.769587

5% Critical value of 0.887 exceeds 0.769587
Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.769587
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-06

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.2	1.5	0.3	0.5056	0.15168
2	1.2	1.5	0.3	0.329	0.0987
3	1.4	1.5	0.1	0.2521	0.02521
4	1.4	1.5	0.1	0.1939	0.01939
5	1.4	1.5	0.1	0.1447	0.01447
6	1.4	1.5	0.1	0.1005	0.01005
7	1.5	1.5	0	0.0593	0
8	1.5	1.5	0	0.0196	0
9	1.5	1.5	0		
10	1.5	1.5	0		
11	1.5	1.4	-0.1		
12	1.5	1.4	-0.1		
13	1.5	1.4	-0.1		
14	1.5	1.4	-0.1		
15	1.5	1.2	-0.3		
16	1.5	1.2	-0.3		

Sum of b values = 0.3195

Sample Standard Deviation = 0.10247

W Statistic = 0.648129

5% Critical value of 0.887 exceeds 0.648129

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.648129

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-16-06

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.182322	0.405465	0.223144	0.5056	0.112821
2	0.182322	0.405465	0.223144	0.329	0.0734142
3	0.336472	0.405465	0.0689929	0.2521	0.0173931
4	0.336472	0.405465	0.0689929	0.1939	0.0133777
5	0.336472	0.405465	0.0689929	0.1447	0.00998327
6	0.336472	0.405465	0.0689929	0.1005	0.00693378
7	0.405465	0.405465	0	0.0593	0
8	0.405465	0.405465	0	0.0196	0
9	0.405465	0.405465	0		
10	0.405465	0.405465	0		
11	0.405465	0.336472	-0.0689929		
12	0.405465	0.336472	-0.0689929		
13	0.405465	0.336472	-0.0689929		
14	0.405465	0.336472	-0.0689929		
15	0.405465	0.182322	-0.223144		
16	0.405465	0.182322	-0.223144		

Sum of b values = 0.233923

Sample Standard Deviation = 0.0757287

W Statistic = 0.636114

5% Critical value of 0.887 exceeds 0.636114

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.636114

Evidence of non-normality at 99% level of significance

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-01

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 0.9
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	0.81
	9/22/2016	0.81
	11/9/2016	0.85
	1/11/2017	0.69
	3/1/2017	0.89
	4/19/2017	0.83
	6/7/2017	0.86 F1
	7/26/2017	0.88
	10/3/2017	0.9
	3/29/2018	0.88
	10/3/2018	0.88
	3/20/2019	0.85
	9/18/2019	0.86
	3/19/2020	0.84
	10/20/2020	0.75

Date	Count	Mean	Significant
5/17/2021	1	0.84	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-02

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	2
	9/22/2016	1.8
	11/9/2016	1.9
	1/11/2017	1.8
	3/2/2017	1.9
	4/19/2017	1.8
	6/7/2017	2
	7/26/2017	2
	10/3/2017	2
	3/28/2018	2
	10/3/2018	2
	3/20/2019	2
	9/18/2019	2
	3/19/2020	2
	10/20/2020	2

From 15 baseline samples
Baseline mean = 1.94667
Baseline std Dev = 0.0833809

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	2.1	[0, 2.09834]	TRUE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-03

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 2.2
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	1.8
	9/22/2016	2
	11/10/2016	2.1
	1/11/2017	1.9
	3/2/2017	2.1
	4/19/2017	2
	6/7/2017	2.1
	7/26/2017	2.2
	10/3/2017	2.2
	3/28/2018	2.2
	10/3/2018	2.2
	3/20/2019	2.2
	9/18/2019	2.2
	3/18/2020	2.2
	10/20/2020	2.1

Date	Count	Mean	Significant
5/17/2021	1	2.2	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	ND<1.25 U
	9/23/2016	1.5
	11/10/2016	1.4
	1/12/2017	1.3
	3/2/2017	1.5
	4/19/2017	1.4
	6/7/2017	1.5
	7/26/2017	1.5
	9/12/2017	1.7
	10/5/2017	1.5
	3/29/2018	1.6
	10/5/2018	1.6
	3/19/2019	1.4
	9/17/2019	1.5
	3/18/2020	1.6
	10/20/2020	1.4

From 16 baseline samples
Baseline mean = 1.47812
Baseline std Dev = 0.11686

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/19/2021	1	1.5	[0, 1.68929]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-05

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	1.7
	9/22/2016	1.7
	11/10/2016	1.7
	1/12/2017	1.6
	3/1/2017	1.8
	4/19/2017	1.7
	6/8/2017	1.8 F1F2
	7/26/2017	1.9
	10/3/2017	1.9
	3/29/2018	1.9
	10/3/2018	1.9
	3/19/2019	1.9
	9/19/2019	1.9
	3/19/2020	1.9
	10/19/2020	1.9

From 15 baseline samples
Baseline mean = 1.81333
Baseline std Dev = 0.10601

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/18/2021	1	1.9	[0, 2.00617]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-06

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 1.5
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	1.2
	9/23/2016	1.4
	11/10/2016	1.4
	1/12/2017	1.2
	3/2/2017	1.5
	4/19/2017	1.4
	6/7/2017	1.4
	7/26/2017	1.5
	10/3/2017	1.5
	3/28/2018	1.5
	10/3/2018	1.5
	3/19/2019	1.5
	9/19/2019	1.5
	3/18/2020	1.5
	10/20/2020	1.5

Date	Count	Mean	Significant
5/17/2021	1	1.5	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	1.3
	9/23/2016	1.2
	11/10/2016	1.1
	1/12/2017	0.98
	7/10/2017	0.91
	7/25/2017	1
	8/10/2017	1.1
	8/30/2017	1.1
	9/12/2017	1.2
	10/5/2017	1.2
	3/29/2018	1.2
	10/4/2018	1.2
	3/20/2019	1.2
	9/17/2019	1.3
	3/19/2020	1.2
	10/20/2020	1.2

From 16 baseline samples
Baseline mean = 1.14937
Baseline std Dev = 0.109998

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/18/2021	1	1.3	[0, 1.34814]	FALSE

Skewness Coefficient

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	7.64937	0.262335	0.36183
MW-16-02	16	8.35625	0.206038	**2.41425**
MW-16-03	16	8.12812	0.211099	**2.37546**
MW-16-04	17	8.02529	0.25904	-0.829411
MW-16-05	16	8.21875	0.215557	**2.30589**
MW-16-06	16	7.89812	0.168808	0.409927
MW-16-07	17	7.85412	0.238617	0.225935

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	8.01719	0.311683	0.109754

Skewness Coefficient

Parameter: pH, Field

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	2.03408	0.0341355	0.26733
MW-16-02	16	2.12274	0.0239879	**2.34693**
MW-16-03	16	2.09503	0.025242	**2.31227**
MW-16-04	17	2.0821	0.0327252	-0.859807
MW-16-05	16	2.10611	0.0255098	**2.21955**
MW-16-06	16	2.06641	0.021292	0.365563
MW-16-07	17	2.06061	0.0303016	0.180134

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	2.08084	0.0388872	-0.0491185

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	8.21	9.04	0.83	0.5056	0.419648
2	8.21	8.5	0.29	0.329	0.09541
3	8.21	8.46	0.25	0.2521	0.063025
4	8.23	8.41	0.18	0.1939	0.034902
5	8.23	8.39	0.16	0.1447	0.023152
6	8.24	8.39	0.15	0.1005	0.015075
7	8.24	8.36	0.12	0.0593	0.007116
8	8.27	8.31	0.04	0.0196	0.000784
9	8.31	8.27	-0.04		
10	8.36	8.24	-0.12		
11	8.39	8.24	-0.15		
12	8.39	8.23	-0.16		
13	8.41	8.23	-0.18		
14	8.46	8.21	-0.25		
15	8.5	8.21	-0.29		
16	9.04	8.21	-0.83		

Sum of b values = 0.659112

Sample Standard Deviation = 0.206038

W Statistic = 0.682233

5% Critical value of 0.887 exceeds 0.682233

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.682233

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-02

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.10535	2.20166	0.0963063	0.5056	0.0486924
2	2.10535	2.14007	0.0347132	0.329	0.0114207
3	2.10535	2.13535	0.0299963	0.2521	0.00756205
4	2.10779	2.12942	0.0216355	0.1939	0.00419512
5	2.10779	2.12704	0.0192545	0.1447	0.00278613
6	2.109	2.12704	0.0180402	0.1005	0.00181304
7	2.109	2.12346	0.0144581	0.0593	0.000857364
8	2.11263	2.11746	0.0048251	0.0196	9.4572e-005
9	2.11746	2.11263	-0.0048251		
10	2.12346	2.109	-0.0144581		
11	2.12704	2.109	-0.0180402		
12	2.12704	2.10779	-0.0192545		
13	2.12942	2.10779	-0.0216355		
14	2.13535	2.10535	-0.0299963		
15	2.14007	2.10535	-0.0347132		
16	2.20166	2.10535	-0.0963063		

Sum of b values = 0.0774214

Sample Standard Deviation = 0.0239879

W Statistic = 0.694457

5% Critical value of 0.887 exceeds 0.694457

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.694457

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-03

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	7.95	8.82	0.87	0.5056	0.439872
2	8	8.31	0.31	0.329	0.10199
3	8	8.29	0.29	0.2521	0.073109
4	8.01	8.15	0.14	0.1939	0.027146
5	8.01	8.13	0.12	0.1447	0.017364
6	8.01	8.13	0.12	0.1005	0.01206
7	8.03	8.12	0.09	0.0593	0.005337
8	8.04	8.05	0.01	0.0196	0.000196
9	8.05	8.04	-0.01		
10	8.12	8.03	-0.09		
11	8.13	8.01	-0.12		
12	8.13	8.01	-0.12		
13	8.15	8.01	-0.14		
14	8.29	8	-0.29		
15	8.31	8	-0.31		
16	8.82	7.95	-0.87		

Sum of b values = 0.677074

Sample Standard Deviation = 0.211099

W Statistic = 0.685816

5% Critical value of 0.887 exceeds 0.685816

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.685816

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-03

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.07317	2.17702	0.10385	0.5056	0.0525065
2	2.07944	2.11746	0.0380181	0.329	0.0125079
3	2.07944	2.11505	0.0356084	0.2521	0.00897688
4	2.08069	2.09802	0.0173272	0.1939	0.00335974
5	2.08069	2.09556	0.0148702	0.1447	0.00215171
6	2.08069	2.09556	0.0148702	0.1005	0.00149445
7	2.08318	2.09433	0.0111456	0.0593	0.000660936
8	2.08443	2.08567	0.00124301	0.0196	2.4363e-005
9	2.08567	2.08443	-0.00124301		
10	2.09433	2.08318	-0.0111456		
11	2.09556	2.08069	-0.0148702		
12	2.09556	2.08069	-0.0148702		
13	2.09802	2.08069	-0.0173272		
14	2.11505	2.07944	-0.0356084		
15	2.11746	2.07944	-0.0380181		
16	2.17702	2.07317	-0.10385		

Sum of b values = 0.0816826

Sample Standard Deviation = 0.025242

W Statistic = 0.698101

5% Critical value of 0.887 exceeds 0.698101

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.698101

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-05

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	8	8.93	0.93	0.5056	0.470208
2	8.03	8.35	0.32	0.329	0.10528
3	8.05	8.29	0.24	0.2521	0.060504
4	8.09	8.28	0.19	0.1939	0.036841
5	8.09	8.28	0.19	0.1447	0.027493
6	8.12	8.25	0.13	0.1005	0.013065
7	8.16	8.2	0.04	0.0593	0.002372
8	8.19	8.19	0	0.0196	0
9	8.19	8.19	0		
10	8.2	8.16	-0.04		
11	8.25	8.12	-0.13		
12	8.28	8.09	-0.19		
13	8.28	8.09	-0.19		
14	8.29	8.05	-0.24		
15	8.35	8.03	-0.32		
16	8.93	8	-0.93		

Sum of b values = 0.715763

Sample Standard Deviation = 0.215557

W Statistic = 0.735057

5% Critical value of 0.887 exceeds 0.735057

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.735057

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: MW-16-05

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.07944	2.18942	0.109975	0.5056	0.0556033
2	2.08318	2.12226	0.039077	0.329	0.0128563
3	2.08567	2.11505	0.0293779	0.2521	0.00740616
4	2.09063	2.11384	0.0232142	0.1939	0.00450124
5	2.09063	2.11384	0.0232142	0.1447	0.0033591
6	2.09433	2.11021	0.015883	0.1005	0.00159625
7	2.09924	2.10413	0.00488999	0.0593	0.000289976
8	2.10291	2.10291	0	0.0196	0
9	2.10291	2.10291	0		
10	2.10413	2.09924	-0.00488999		
11	2.11021	2.09433	-0.015883		
12	2.11384	2.09063	-0.0232142		
13	2.11384	2.09063	-0.0232142		
14	2.11505	2.08567	-0.0293779		
15	2.12226	2.08318	-0.039077		
16	2.18942	2.07944	-0.109975		

Sum of b values = 0.0856123

Sample Standard Deviation = 0.0255098

W Statistic = 0.750874

5% Critical value of 0.887 exceeds 0.750874

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.750874

Evidence of non-normality at 99% level of significance

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% Two-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	7.4
	9/22/2016	8.25
	11/9/2016	7.94
	1/11/2017	7.7
	3/1/2017	7.87
	4/19/2017	7.69
	6/7/2017	7.68
	7/26/2017	7.55
	10/3/2017	7.62
	3/29/2018	7.46
	10/3/2018	7.73
	3/20/2019	7.46
	9/18/2019	7.86
	3/19/2020	7.7
	10/20/2020	7.24

From 15 baseline samples
Baseline mean = 7.67667
Baseline std Dev = 0.246914

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1)/2 = 97.5 %
t is Percentile of Student's T-Test (0.95/1/2) = 0.975
Degrees of Freedom = 15 (background observations) - 1
t(0.975, 15) = 2.14479

Date	Samples	Mean	Interval	Significant
5/17/2021	1	7.24	[7.13, 8.22]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-02

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 9.04
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	8.39
	9/22/2016	9.04
	11/9/2016	8.5
	1/11/2017	8.21
	3/2/2017	8.46
	4/19/2017	8.41
	6/7/2017	8.36
	7/26/2017	8.23
	10/3/2017	8.21
	3/28/2018	8.24
	10/3/2018	8.31
	3/20/2019	8.23
	9/18/2019	8.39
	3/19/2020	8.27
	10/20/2020	8.21

Date	Count	Mean	Significant
5/17/2021	1	8.24	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-03

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 8.82
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	8.29
	9/22/2016	8.82
	11/10/2016	8.31
	1/11/2017	8.05
	3/2/2017	8.15
	4/19/2017	8.12
	6/7/2017	8.13
	7/26/2017	8.01
	10/3/2017	7.95
	3/28/2018	8.01
	10/3/2018	8.04
	3/20/2019	8
	9/18/2019	8.13
	3/18/2020	8.01
	10/20/2020	8

Date	Count	Mean	Significant
5/17/2021	1	8.03	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% Two-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	7.97
	9/23/2016	7.72
	11/10/2016	8.21
	1/12/2017	7.69
	3/2/2017	8.09
	4/19/2017	8.02
	6/7/2017	7.91
	7/26/2017	8.25
	9/11/2017	8.19
	10/5/2017	8.19
	3/29/2018	8.27
	10/5/2018	8.27
	3/19/2019	8.09
	9/17/2019	8.3
	3/18/2020	8.19
	10/20/2020	7.56

From 16 baseline samples
Baseline mean = 8.0575
Baseline std Dev = 0.22971

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1)/2 = 97.5 %
t is Percentile of Student's T-Test (0.95/1/2) = 0.975
Degrees of Freedom = 16 (background observations) - 1
t(0.975, 16) = 2.13145

Date	Samples	Mean	Interval	Significant
5/19/2021	1	7.51	[7.55, 8.56]	TRUE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-05

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 8.93
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/19/2016	8.19
	9/22/2016	8.93
	11/10/2016	8.35
	1/12/2017	8
	3/1/2017	8.29
	4/19/2017	8.2
	6/8/2017	8.16
	7/26/2017	8.09
	10/3/2017	8.12
	3/29/2018	8.03
	10/3/2018	8.28
	3/19/2019	8.05
	9/19/2019	8.28
	3/19/2020	8.19
	10/19/2020	8.09

Date	Count	Mean	Significant
5/18/2021	1	8.25	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% Two-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	8
	9/23/2016	8.27
	11/10/2016	8.1
	1/12/2017	7.76
	3/2/2017	8.06
	4/19/2017	8.01
	6/7/2017	7.89
	7/26/2017	7.9
	10/3/2017	7.83
	3/28/2018	7.83
	10/3/2018	7.96
	3/19/2019	7.69
	9/19/2019	7.96
	3/18/2020	7.73
	10/20/2020	7.74

From 15 baseline samples
Baseline mean = 7.91533
Baseline std Dev = 0.159547

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1)/2 = 97.5 %
t is Percentile of Student's T-Test (0.95/1/2) = 0.975
Degrees of Freedom = 15 (background observations) - 1
t(0.975, 15) = 2.14479

Date	Samples	Mean	Interval	Significant
5/17/2021	1	7.64	[7.56, 8.27]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% Two-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	8.03
	9/23/2016	8.02
	11/10/2016	8.05
	1/12/2017	7.69
	7/10/2017	7.74
	7/25/2017	7.5
	8/10/2017	7.84
	8/30/2017	7.56
	9/11/2017	7.51
	10/5/2017	7.71
	3/29/2018	7.78
	10/4/2018	8.15
	3/20/2019	7.87
	9/17/2019	8.19
	3/19/2020	8.3
	10/20/2020	7.72

From 16 baseline samples
Baseline mean = 7.85375
Baseline std Dev = 0.246438

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1)/2 = 97.5 %
t is Percentile of Student's T-Test (0.95/1/2) = 0.975
Degrees of Freedom = 16 (background observations) - 1
t(0.975, 16) = 2.13145

Date	Samples	Mean	Interval	Significant
5/18/2021	1	7.86	[7.31, 8.4]	FALSE

Skewness Coefficient

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	33.4375	5.96622	0.362098
MW-16-02	16	2.36875	1.93863	0.509235
MW-16-03	16	2.73125	1.97204	0.09773
MW-16-04	17	7.85294	7.59474	**1.27252**
MW-16-05	16	3.56562	2.72401	**1.35571**
MW-16-06	16	27.6563	17.2342	0.20805
MW-16-07	17	18.8118	22.7264	**2.24946**

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	13.7671	16.4018	**1.72288**

Skewness Coefficient

Parameter: Sulfate

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	3.49492	0.177141	0.0951712
MW-16-02	16	0.473915	0.960767	-0.0402426
MW-16-03	16	0.627399	1.00125	-0.399455
MW-16-04	17	1.6645	0.892427	0.551856
MW-16-05	16	0.970278	0.870576	-0.55014
MW-16-06	16	3.04148	0.8898	-0.97497
MW-16-07	17	2.42113	1.01629	0.410858

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	1.8174	1.39683	-0.14365

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	25
	9/22/2016	31
	11/9/2016	26
	1/11/2017	26
	3/1/2017	32
	4/19/2017	34
	6/7/2017	41 F1
	7/26/2017	37
	10/3/2017	34
	3/29/2018	28
	10/3/2018	40
	3/20/2019	41
	9/18/2019	32
	3/19/2020 ~	45
	10/20/2020	32

From 15 baseline samples
Baseline mean = 33.6
Baseline std Dev = 6.13887

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	31	[0, 44.767]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-02

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 73.3333%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 10
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	ND<1 U
	9/22/2016	ND<1 U
	11/9/2016	ND<5 U
	1/11/2017	ND<5 U
	3/2/2017	ND<10 U
	4/19/2017	ND<10 U
	6/7/2017	ND<10 U
	7/26/2017	ND<1 U
	10/3/2017	ND<1 U
	3/28/2018	1.5
	10/3/2018	1.3
	3/20/2019	ND<1 U
	9/18/2019	1.1
	3/19/2020	1.5
	10/20/2020	ND<10 U

Date	Count	Mean	Significant
5/17/2021	1	10	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-03

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 93.3333%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 10
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/11/2016	ND<10 U
	9/22/2016	ND<1 U
	11/10/2016	ND<5 U
	1/11/2017	ND<5 U
	3/2/2017	ND<5 U
	4/19/2017	ND<10 U
	6/7/2017	ND<10 U
	7/26/2017	ND<1 U
	10/3/2017	ND<1 U
	3/28/2018	ND<1 U
	10/3/2018	1.2
	3/20/2019	ND<1 U
	9/18/2019	ND<10 U
	3/18/2020	ND<10 U
	10/20/2020	ND<5 U

Date	Count	Mean	Significant
5/17/2021	1	10	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-16-04

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 86.6667%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 15
Maximum Baseline Concentration = 50
Confidence Level = 93.8%
False Positive Rate = 6.2%

Baseline Measurements	Date	Value
	8/19/2016	ND<50 U
	9/23/2016	24
	11/10/2016	ND<20 U
	1/12/2017	ND<20 U
	3/2/2017	ND<20 U
	4/19/2017	ND<20 U
	6/7/2017	17
	7/26/2017	ND<10 U
	9/12/2017	ND<5 U
	10/5/2017	ND<5 U
	3/29/2018	ND<5 U
	10/5/2018	ND<5 U
	3/19/2019	ND<5 U
	9/17/2019	ND<5 U
	3/18/2020	ND<5 U

Date	Count	Mean	Significant
5/19/2021	1	5	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-05

Parameter: Sulfate

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	ND<1.60944 U
	9/22/2016	ND<-0.693147 U
	11/10/2016	ND<0.916291 U
	1/12/2017	ND<0.916291 U
	3/1/2017	ND<1.60944 U
	4/19/2017	ND<1.60944 U
	6/8/2017	ND<1.60944 UF1F2
	7/26/2017	0.641854
	10/3/2017	ND<-0.693147 U
	3/29/2018	1.06471
	10/3/2018	0.405465
	3/19/2019	1.8563
	9/19/2019	0.875469
	3/19/2020	1.28093
	10/19/2020	0.0953102

From 15 baseline samples
Baseline mean = 0.873605
Baseline std Dev = 0.807359

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/18/2021	1	2.42037	[0, 2.34225]	TRUE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	ND<5 U
	9/23/2016	2.6
	11/10/2016	7.9
	1/12/2017	11
	3/2/2017	16
	4/19/2017	22
	6/7/2017	27
	7/26/2017	19
	10/3/2017	23
	3/28/2018 ~	43
	10/3/2018	33
	3/19/2019	44
	9/19/2019	38
	3/18/2020	51
	10/20/2020	40

From 15 baseline samples
Baseline mean = 25.5
Baseline std Dev = 15.4444

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	60	[0, 53.5945]	TRUE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: Sulfate

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	3.52636
	9/23/2016	2.48491
	11/10/2016	2.26176
	1/12/2017	2.18605
	7/10/2017	4.5326
	7/25/2017	3.82864
	8/10/2017	3.3322
	8/30/2017	3.17805
	9/12/2017	2.83321
	10/5/2017	2.70805
	3/29/2018	2.11626
	10/4/2018	1.64866
	3/20/2019	1.60944
	9/17/2019	1.36098
	3/19/2020	1.335
	10/20/2020	0.993252

From 16 baseline samples
Baseline mean = 2.49596
Baseline std Dev = 1.00007

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/18/2021	1	1.22378	[0, 4.3031]	FALSE

Skewness Coefficient

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. Dev.	Skewness
MW-16-01	16	1250	51.6398	0
MW-16-02	16	1156.25	51.2348	-0.251976
MW-16-03	16	1028.13	61.4512	0.0313701
MW-16-04	17	4755.88	361.37	0.0534119
MW-16-05	16	1069.38	67.0789	-0.372395
MW-16-06	16	1005.63	54.4021	0.357082
MW-16-07	17	706.471	26.2062	0.870173

All Locations

Obs.	Mean	Std. Dev.	Skewness
114	1587.81	1349.26	**1.94796**

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-01

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1300
	9/22/2016	1200
	11/9/2016	1300
	1/11/2017	1300
	3/1/2017	1300
	4/19/2017	1300
	6/7/2017	1200
	7/26/2017	1300
	10/3/2017	1300
	3/29/2018	1200
	10/3/2018	1200
	3/20/2019	1200
	9/18/2019	1300
	3/19/2020	1200
	10/20/2020	1200

From 15 baseline samples
Baseline mean = 1253.33
Baseline std Dev = 51.6398

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	1200	[0, 1347.27]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-02

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1200
	9/22/2016	1200
	11/9/2016	1200
	1/11/2017	1200
	3/2/2017	1200
	4/19/2017	1100
	6/7/2017	1100
	7/26/2017	1200
	10/3/2017	1200
	3/28/2018	1200
	10/3/2018	1200
	3/20/2019	1100
	9/18/2019	1100
	3/19/2020	1100
	10/20/2020	1100

From 15 baseline samples
Baseline mean = 1160
Baseline std Dev = 50.7093

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	1100	[0, 1252.24]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-03

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1100
	9/22/2016	1000
	11/10/2016	1100
	1/11/2017	1100
	3/2/2017	1100
	4/19/2017	1000
	6/7/2017	1000
	7/26/2017	1100
	10/3/2017	990
	3/28/2018	1000
	10/3/2018	1000
	3/20/2019	1100
	9/18/2019	990
	3/18/2020	910
	10/20/2020	990

From 15 baseline samples
Baseline mean = 1032
Baseline std Dev = 61.5514

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	970	[0, 1143.97]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-04

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	4500
	9/23/2016	4300
	11/10/2016	5000
	1/12/2017	5000
	3/2/2017	4900
	4/19/2017	4600
	6/7/2017	4800
	7/26/2017	5100
	9/12/2017	5100
	10/5/2017	4900
	3/29/2018 ~	4450
	10/5/2018	4500
	3/19/2019	4800
	9/17/2019 ~	5000
	3/18/2020	4200
	10/20/2020	4200

From 16 baseline samples
Baseline mean = 4709.38
Baseline std Dev = 316.343

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/19/2021	1	5500	[0, 5281.01]	TRUE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-05

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	1100
	9/22/2016	1100
	11/10/2016	1100
	1/12/2017	1200
	3/1/2017	1100
	4/19/2017	1000
	6/8/2017	1100
	7/26/2017	1100
	10/3/2017	1000
	3/29/2018	1100
	10/3/2018	1100
	3/19/2019	1100
	9/19/2019	1000
	3/19/2020	1100
	10/19/2020	940

From 15 baseline samples
Baseline mean = 1076
Baseline std Dev = 63.7854

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/18/2021	1	970	[0, 1192.03]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-06

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/11/2016	1000
	9/23/2016	970
	11/10/2016	1000
	1/12/2017	1100
	3/2/2017	1000
	4/19/2017	970
	6/7/2017	1100
	7/26/2017	1000
	10/3/2017	990
	3/28/2018	1000
	10/3/2018	1000
	3/19/2019	1000
	9/19/2019	1100
	3/18/2020	890
	10/20/2020	970

From 15 baseline samples
Baseline mean = 1006
Baseline std Dev = 56.2901

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 15 (background observations) - 1
t(0.95, 15) = 1.76131

Date	Samples	Mean	Interval	Significant
5/17/2021	1	1000	[0, 1108.4]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-16-07

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	8/19/2016	770
	9/23/2016	680
	11/10/2016	720
	1/12/2017	730
	7/10/2017	690
	7/25/2017	680
	8/10/2017	710
	8/30/2017	700
	9/12/2017	680
	10/5/2017	700
	3/29/2018	700
	10/4/2018	690
	3/20/2019	710
	9/17/2019	750
	3/19/2020	720
	10/20/2020	670

From 16 baseline samples
Baseline mean = 706.25
Baseline std Dev = 27.0493

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 16 (background observations) - 1
t(0.95, 16) = 1.75305

Date	Samples	Mean	Interval	Significant
5/18/2021	1	710	[0, 755.128]	FALSE