2019 Annual Groundwater Monitoring Report

DTE Electric Company
Sibley Quarry Coal Combustion Residual Landfill

801 Fort Street
Trenton, Michigan

January 2020

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Prepared For
DTE Electric Company

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Executive 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 July 30, 2018. The CCR Rule, which became effective on October 19, 2015 (amendment effective August 29, 2018), applies to the DTE Electric Company (DTE Electric) Sibley Quarry Landfill (SQLF) 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 Environmental Corporation (TRC), has prepared this Annual Groundwater Monitoring Report for calendar year 2019 activities at the SQLF CCR unit.

The semiannual detection monitoring events for 2019 were completed in March/April and September 2019 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 2019 are presented in this report.

SSIs for Appendix III constituents were confirmed in a few wells: for boron in one sample in March/April 2019 and for chloride in one sample and for sulfate in one sample in September 2019. TRC performed an alternate source demonstration (ASD) after a previous sampling event and/or in 2019 and determined the observation of these constituents SSIs were a result of natural variability in groundwater quality and not attributable to the SQLF CCR unit.

Based on the hydrogeology at the Site, the uppermost aquifer is in an area where pumping has been performed continuously since before CCR disposal began and will continue to be dewatered, by which a continuous inward hydraulic gradient is maintained. As a result, the uppermost aquifer perimeter monitoring wells cannot have been affected by the SQLF CCR unit operations to date, nor could they be in the future under current pumping conditions. Therefore, detection monitoring will be continued at the SQLF CCR unit in accordance with §257.94 of the CCR Rule.

Section 1
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 July 30, 2018. The CCR Rule, which became effective on October 19, 2015 (amendment effective August 29, 2018), applies to the DTE Electric Company (DTE Electric) Sibley Quarry Landfill Coal Combustion Residual Landfill (SQLF) 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 Environmental Corporation (TRC), has prepared this Annual Groundwater Monitoring Report for calendar year 2019 activities at the SQLF CCR unit (2019 Annual Report).

In the January 31, 2018 *Annual Groundwater Monitoring Report for the Sibley Quarry Landfill,* covering calendar year 2017 (2017 Annual Report), DTE Electric reported that while some natural variability was observed in compliance wells, there was no evidence of release from the CCR unit. TRC performed an alternate source demonstration (ASD) and concluded that the variability in boron, chloride, sulfate, and TDS concentrations in a few locations was a result of natural variability in groundwater quality. No statistically significant exceedances of the prediction limits for Appendix III constituents were noted in 2018 (TRC, January 2019).

This 2019 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 March/April and September 2019 semiannual groundwater monitoring events for the SQLF CCR unit. The semiannual detection monitoring events for 2019 were completed in March/April and September 2019 and included sampling and analyzing groundwater within the groundwater monitoring system for the indicator parameters listed in Appendix III to the CCR Rule. Detection monitoring for these events continued to be performed in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill* (QAPP) (TRC, August 2016; revised March 2017) and statistically evaluated per the *Groundwater Statistical Evaluation Plan – DTE Electric Company Sibley Quarry 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 statistically significant increases (SSIs) of detection monitoring parameters compared to background levels.

1.2 Site Overview

The SQLF is located in Section 7, Township 4 South, Range 11 East, at 801 Fort Street (a.k.a. 502 Quarry Road) in Trenton, Wayne County, Michigan (Figure 1). The SQLF is located about two miles north of the DTE Electric Trenton Power Plant. The SQLF is bounded mostly by Fort Street to the west, Sibley Road to the north, the former Detroit and Toledo Shore Line Railroad and West Jefferson Avenue to the east, and the former Vulcan Mold & Iron Company (now owned by Danou Enterprises) and the DTE Electric Jefferson Substation to the south.

The SQLF is a licensed Type III solid waste disposal facility owned and operated by DTE Electric. The disposal facility currently receives the majority of CCR from the Trenton Channel and River Rouge Power Plants. In addition, a small amount of CCR is also received from the Monroe Power Plant. The SQLF is operated under the current operating license number 9394 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 SQLF CCR unit is located approximately one-half mile west of the Detroit River. The Sibley quarry was originally developed to mine limestone beginning in the mid-1800s and was mined to over 300 feet below ground surface (ft bgs) in some areas before becoming inactive. In 1951, Detroit Edison (now DTE Electric) acquired Sibley Quarry and began to manage CCR in the SQLF. As part of normal operations, beginning in 1951, the SQLF has been continuously dewatered to approximately 300 ft bgs maintaining a water level in the bottom of the quarry by pumping an average of approximately 1.5 million gallons per day.

The SQLF resides in an area characterized by near surface deposits of glacio-lacustrine clay and silt units on top of thick strata of dolomite and limestone bedrock. The SQLF is located in an area where the Dundee Formation (mostly limestone) and the Detroit River Group (limestone, dolostone and some sandstone) underlie the unconsolidated glacial drift and are the uppermost aquifer. At SQLF, the Dundee Formation is overlain by anywhere from less than 15 feet to more than 70 feet of unconsolidated material, most of which is clay-rich soil with some fill. The top of the Dundee Formation limestone/dolostone bedrock was encountered at depths ranging from 16.5 to 74.5 ft bgs and including the underlying Detroit River Group limestone/dolostone/ sandstone, extends to depths ranging from 235 to over 310 ft bgs. The underlying Sylvania Sandstone was encountered at depths ranging from 235 to 300 ft bgs in some locations at the SQLF.

As expected, data show that groundwater levels are significantly lower within the bedrock in monitoring wells that are the closest to the quarry where significant pumping is occurring, with water levels ranging from 120 to more than 250 ft bgs. Groundwater flow is consistently inward

toward the base of the quarry due to continuous pumping at the quarry that hydraulically controls groundwater flow. The pumped water from the quarry is managed in accordance with a National Pollution Discharge Elimination System (NPDES) permit. Quarry dewatering results in all the perimeter uppermost aquifer CCR monitoring wells being upgradient of the SQLF CCR unit.

Because the uppermost aquifer is in an area where pumping has been performed continuously before CCR disposal began, and will be continued to be dewatered, a continuous inward hydraulic gradient is maintained. As a result, the uppermost aquifer perimeter monitoring wells cannot have been affected by the SQLF CCR unit operations to date, nor could they be in the future under current pumping conditions. Given that groundwater flow is inward toward the quarry, all of the perimeter monitoring wells in the groundwater monitoring system are located in an up gradient position relative to the landfill; therefore, monitoring of the SQLF CCR unit using interwell statistical methods (upgradient to downgradient) is not possible. Instead, based on these hydrogeologic conditions, intrawell statistical approaches are the appropriate method to evaluate groundwater data statistically. Consequently, intrawell statistical tests are being used during detection monitoring as outlined in the Stats Plan.

Section 2
Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for the SQLF CCR unit as detailed in the *Groundwater Monitoring System Summary Report – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill* (GWMS Report) (TRC, October 2017). The detection monitoring well network for the SQLF CCR unit currently consists of eight monitoring wells that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

As discussed above and in the Stats Plan, intrawell statistical methods for the SQLF were selected because the uppermost aquifer is in an area where pumping has been performed continuously since before CCR disposal began, and will be continued to be dewatered, resulting in a maintained continuous inward hydraulic gradient. Given that groundwater flow is inward under pumping conditions toward the quarry, all of the perimeter monitoring wells in the groundwater monitoring system are located in an up gradient position relative to the landfill. Therefore, monitoring of the SQLF CCR unit using interwell statistical methods (upgradient to downgradient) is not possible. This also supports that the aquifer is unaffected by the CCR unit, where, as a result of the continuously maintained inward gradient, groundwater within the uppermost aquifer cannot have been affected by the SQLF CCR unit operations to date, nor could they be in the future under current pumping conditions.

An intrawell statistical approach requires that each of the monitoring wells double as background and compliance wells, 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. Monitoring wells MW-101 through MW-107 and MW-108A are located around the perimeter of the SQLF and provide data on both background and perimeter groundwater quality that has not been affected by the CCR unit (total of eight background/compliance monitoring wells).

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 2019 was performed on March 27, March 28, and April 16, 2019, by TRC personnel and samples were analyzed by TestAmerica in accordance with the QAPP. Static water elevation data were collected at all eight monitoring well locations. Groundwater samples were collected from the eight detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the March/April 2019 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 2019 was performed during September 24 through September 26, 2019 by TRC personnel and samples were analyzed by TestAmerica in accordance with the QAPP. Static water elevation data were collected at all eight monitoring well locations. Groundwater samples were collected from the eight detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the September 2019 event is provided on Table 1 (static groundwater elevation data), Table 2 (field data), and Table 4 (analytical results).

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

Groundwater elevation data collected during the March/April and September 2019 sampling events continue to show that groundwater within the uppermost aquifer flows radially into the quarry as a result of continuous pumping/dewatering at the Site. Groundwater potentiometric surface elevations measured across the site during the March/April 2019, and the September 2019 sampling events are provided on Table 1 and were used to construct the groundwater potentiometric surface maps shown on Figures 3 and 4, respectively.

The data indicates that current groundwater flow rates and direction are consistent with previous monitoring events. The average hydraulic gradient throughout the site during

both 2019 monitoring events are estimated at 0.085 ft/ft, resulting in an estimated average seepage velocity of approximately 5.8 ft/day or 2,100 ft/year, using the average hydraulic conductivity of 6.8 ft/day (Golder, 2015) and an assumed effective porosity of 0.1.

Given that groundwater flow is maintained inward toward the quarry under active pumping, all of the perimeter monitoring wells in the groundwater monitoring system are located in an upgradient position relative to the landfill. Therefore, there is no potential for groundwater to migrate away from the SQLF CCR unit.

Section 3
Statistical Evaluation

3.1 Establishing Background Limits

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 eight established detection monitoring wells (MW-101 through MW-107 and MW-108A). The 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 SQLF CCR unit by comparing concentrations in the detection monitoring wells to their respective background limits for each Appendix III indicator parameter.

3.2 Data Comparison to Background Limits – First 2019 Semiannual Event (March/April 2019)

The concentrations of the indicator parameters in each of the detection monitoring wells (MW-101 through MW-107 and MW-108A) were compared to their respective statistical background limits calculated from the background data collected from each individual well (i.e., monitoring data from MW-101 is compared to the background limit developed using the background dataset from MW-101, and so forth).

The comparisons for the March/April 2019 monitoring event are presented on Table 3. Based on the statistical evaluation of the March and April 2019 Appendix III indicator parameters a resample of the following was collected in accordance with the Stats Plan.

- Boron at MW-101.

3.3 Verification Resampling for the First 2019 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 rules. 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. Constituents that have been addressed through an ASD will not be analyzed for verification purposes.

Verification resampling for the March/April 2019 event was conducted on May 8, 2019 by TRC personnel in accordance with the QAPP. A summary of the analytical results collected during the May 2019 resampling event is provided on Table 3. The associated data quality review is included in Appendix C

The May 2019 verification resampling confirmed the SSI for Boron at monitoring well MW-101. TRC reviewed the data and determined that boron is a result of natural variability in groundwater quality and not attributable to the SQLF CCR unit as presented in the *Alternate Source Demonstration: 2019 First Semiannual Detection Monitoring Sampling Event for the Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan*, dated August 8, 2019 (August 2019 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 Semiannual Event (September 2019)

The comparisons for the September 2019 monitoring event are presented on Table 4. Based on the statistical evaluation of the September 2019 Appendix III indicator parameters a resample of the following was collected in accordance with the Stats Plan:

- Chloride at MW-106, and
- Sulfate at MW-108A.

3.5 Verification Resampling for the Second 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 rules. 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. Constituents that have been addressed through an ASD will not be analyzed for verification purposes.

Verification resampling for the September 2019 event was conducted on November 12, 2019 by TRC personnel in accordance with the QAPP. A summary of the analytical results collected during the November 2019 resampling event is provided on Table 4. The associated data quality review is included in Appendix C.

The November 2019 verification sampling confirmed the SSI for sulfate at monitoring well MW-108A. TRC reviewed the data and determined that sulfate is a result of natural variability in groundwater quality and not attributable to the SQLF CCR unit as presented in the *Alternate*

Source Demonstration: 2019 Second Semiannual Detection Monitoring Sampling Event for the Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan, dated January 30, 2020 (January 2020 ASD) (Appendix B).

The MW-106 chloride verification result is below the prediction limit and no SSI exists for the September 2019 sampling event for this parameter in accordance with the Stats Plan and the Unified Guidance. As no SSIs were found that were not addressed within an ASD, detection monitoring was continued at the SQLF CCR unit in accordance with §257.94 of the CCR Rule.

Section 4
Conclusions and Recommendations

Potential SSIs over background limits were noted for a few Appendix III constituents in one or more downgradient wells during the March/April and September 2019 monitoring events. These potential SSIs were either not statistically significant (i.e. verification resampling did not confirm the exceedance) or were addressed through an ASD that demonstrated the observed concentrations were a result of natural variability in groundwater quality and not attributable to the SQLF CCR unit.

As discussed above, and in the GWMS Report, because the uppermost aquifer is in an area where pumping has been performed continuously since before CCR disposal began and will be continued to be dewatered, a continuous inward hydraulic gradient is maintained. As a result, the uppermost aquifer perimeter monitoring wells cannot have been affected by the SQLF CCR unit operations to date, nor could they be in the future under current pumping conditions. Due to limitations on CCR Rule implementation timelines, the background data sets are of relatively short duration for capturing the occurrence of natural temporal changes in the aquifer being drawn inward toward the SQLF. Therefore, detection monitoring will be continued at the SQLF CCR unit in accordance with §257.94.

No corrective actions were performed in 2019. The next semiannual monitoring event at the SQLF CCR unit is scheduled for the second calendar quarter of 2020.

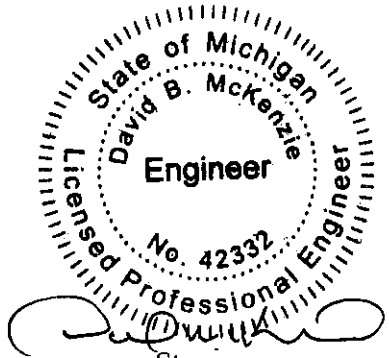
Section 5
Groundwater Monitoring Report Certification

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
Sibley Quarry Coal Combustion Residual Landfill
Trenton, Michigan

CERTIFICATION

I hereby certify that the annual groundwater and corrective action report presented within this document for the SQLF 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: October 31, 2021	 Stamp
Company: TRC Engineers Michigan, Inc.	Date: January 30, 2020	

Section 6
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Tables

Table 1
Summary of Groundwater Elevation Data – March & September 2019
Sibley Quarry Landfill – RCRA CCR Monitoring Program
Trenton, Michigan

Well ID	MW-101		MW-102		MW-103		MW-104		MW-105		MW-106		MW-107		MW-108A	
Date Installed	7/14/2015		7/16/2015		7/15/2015		7/16/2015		3/30/2016		3/28/2016		4/6/2016		1/24/2017	
TOC Elevation	617.67		615.03		607.23		608.39		593.28		606.75		610.03		594.06	
Geologic Unit of Screened Interval	Limestone Bedrock		Limestone Bedrock		Limestone Bedrock		Limestone Bedrock		Limestone Bedrock		Limestone Bedrock		Limestone Bedrock		Sandstone Bedrock	
Bottom of Open Hole Elevation	295.2		342.6		294.7		296.0		290.7		304.0		336.5		290.5	
Unit	ft BTOC	ft	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	Depth to Water	GW Elevation
3/27/2019	177.87	439.80	240.38	374.65	173.80	433.43	120.54	487.85	22.33	570.95	185.85	420.90	156.33	453.70	54.22	539.84
9/24/2019	177.50	440.17	238.90	376.13	180.00	427.23	119.75	488.64	23.00	570.28	182.30	424.45	155.85	454.18	52.10	541.96

Notes:

Elevations are reported in feet relative to the national geodetic vertical datum of 1929.

ft BTOC - feet below top of casing

Table 2
Summary of Field Data – March, April, and September 2019
Sibley Quarry Landfill – RCRA CCR Monitoring Program
Trenton, 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-101	3/27/2019	0.88	13.3	7.0	1,440	11.13	13.2
	9/25/2019	0.09	-63.7	7.0	1,501	13.34	2.36
MW-102	4/16/2019	8.42	103.1	7.0	1,637	12.06	41.4
	9/26/2019	1.93	48.6	6.8	1,635	13.01	2.10
MW-103	3/27/2019	0.16	-327.8	6.9	2,593	11.78	1.99
	9/25/2019	0.18	-188.7	6.9	2,704	13.39	2.63
MW-104	3/27/2019	0.12	-273.9	7.0	2,474	11.55	1.66
	9/24/2019	0.10	-188.0	7.1	2,617	13.59	3.91
MW-105	3/27/2019	0.08	-106.0	6.9	8,472	11.66	2.07
	9/25/2019	0.12	-6.8	6.9	9,536	14.04	1.24
MW-106	3/28/2019	0.16	-329.9	6.9	2,484	11.46	1325
	9/25/2019	0.09	-315.0	6.9	2,769	14.06	500
MW-107	3/28/2019	0.16	-270.4	6.8	36,426	10.56	7.86
	9/24/2019	0.15	-209.9	6.8	40,041	13.58	1.34
MW-108A	3/27/2019	0.07	-47.8	6.9	5,061	11.72	2.20
	9/25/2019	0.06	-232.9	6.9	5,975	13.07	1.53

Notes:

mg/L - milligrams per liter.

mV - milliVolt.

SU - standard unit.

umhos/cm - micro-mhos per centimeter.

deg C - degrees celcius.

NTU - nephelometric turbidity units.

Table 3
Comparison of Appendix III Parameter Results to Background Limits – March, April, and May 2019
Sibley Quarry Landfill – RCRA CCR Monitoring Program
Trenton, Michigan

Sample Location:		MW-101			MW-102		MW-103		MW-104		MW-105		MW-106		MW-107		MW-108A	
Sample Date:		3/27/2019	5/8/2019[1]	PL	4/16/2019	PL	3/27/2019	PL	3/27/2019	PL	3/27/2019	PL	3/28/2019	PL	3/27/2019	PL	3/27/2019	PL
Constituent	Unit	Data			Data		Data		Data		Data		Data		Data		Data	
Appendix III																		
Boron	ug/L	290	**370[2]**	280	140	200	770	810	740	970	2,000	2,600	**900[3]**	810	1,400	1,500	1,300	1,400
Calcium	ug/L	220,000	--	270,000	270,000	310,000	550,000	630,000	480,000	530,000	610,000	830,000	560,000	650,000	1,300,000	1,500,000	430,000	470,000
Chloride	mg/L	190	--	200	250	270	150	160	230	800	3,400	4,800	120	130	20,000	21,000	1,800	1,900
Fluoride	mg/L	1.9	--	2.1	1.6	1.9	1.7	2.1	1.5	2.8	0.95	5.8	1.6	3.0	< 2.5	2.5	1.0	2.5
pH, Field	SU	7.0	6.8	6.8 - 7.8	7.0	6.5 - 7.6	6.9	6.7 - 7.6	7.0	6.8 - 7.9	6.9	6.6 - 7.9	6.9	6.5 - 7.6	6.8	6.5 - 7.6	6.9	6.7 - 6.9
Sulfate	mg/L	600	--	740	640	770	1,900	2,100	1,900	1,900	1,900	2,000	1,900	2,100	3,300	3,800	1,100	1,100
Total Dissolved Solids	mg/L	1,300	--	1,400	1,500	1,800	3,100	3,700	2,800	4,100	7,000	9,700	2,900	3,200	21,000	41,000	4,100	4,900

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

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) - Results shown for verification sampling performed on 5/8/2019.

(2) - New successful alternative source demonstration was completed following confirmation of the initial statistically significant exceedance.

(3) - Concentraton addressed through initial alternate source demonstration.

Table 4
Comparison of Appendix III Parameter Results to Background Limits – September and November 2019
Sibley Quarry Landfill – RCRA CCR Monitoring Program
Trenton, Michigan

Sample Location:		MW-101		MW-102		MW-103		MW-104		MW-105		MW-106			MW-107		MW-108A		
Sample Date:		9/25/2019	PL	9/26/2019	PL	9/25/2019	PL	9/24/2019	PL	9/25/2019	PL	9/25/2019	11/12/2019[2]	PL	9/24/2019	PL	9/25/2019	11/12/2019[2]	PL
Constituent	Unit	Data		Data		Data		Data		Data		Data			Data		Data		
Appendix III																			
Boron	ug/L	260	280	110	200	680	810	740	970	2,100	2,600	**2,400[1]**	--	810	1,400	1,500	1,400	--	1,400
Calcium	ug/L	210,000	270,000	270,000	310,000	600,000	630,000	470,000	530,000	660,000	830,000	520,000	--	650,000	1,400,000	1,500,000	440,000	--	470,000
Chloride	mg/L	190	200	150	270	140	160	200	800	3,600	4,800	**230**	120	130	19,000	21,000	**2,000[1]**	--	1,900
Fluoride	mg/L	1.9	2.1	1.7	1.9	1.8	2.1	1.6	2.8	1.1	5.8	1.6	--	3.0	< 2.5	2.5	1.1	--	2.5
pH, Field	SU	7.0	6.8 - 7.8	6.8	6.5 - 7.6	6.9	6.7 - 7.6	7.1	6.8 - 7.9	6.9	6.6 - 7.9	6.9	6.7	6.5 - 7.6	6.8	6.5 - 7.6	6.9	6.9	6.7 - 6.9
Sulfate	mg/L	560	740	720	770	2,000	2,100	1,800	1,900	2,000	2,000	1,900	--	2,100	3,300	3,800	**1,200**	**1,200[3]**	1,100
Total Dissolved Solids	mg/L	1,400	1,400	1,500	1,800	3,300	3,700	2,900	4,100	7,300	9,700	3,100	--	3,200	40,000	41,000	4,300	--	4,900

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).

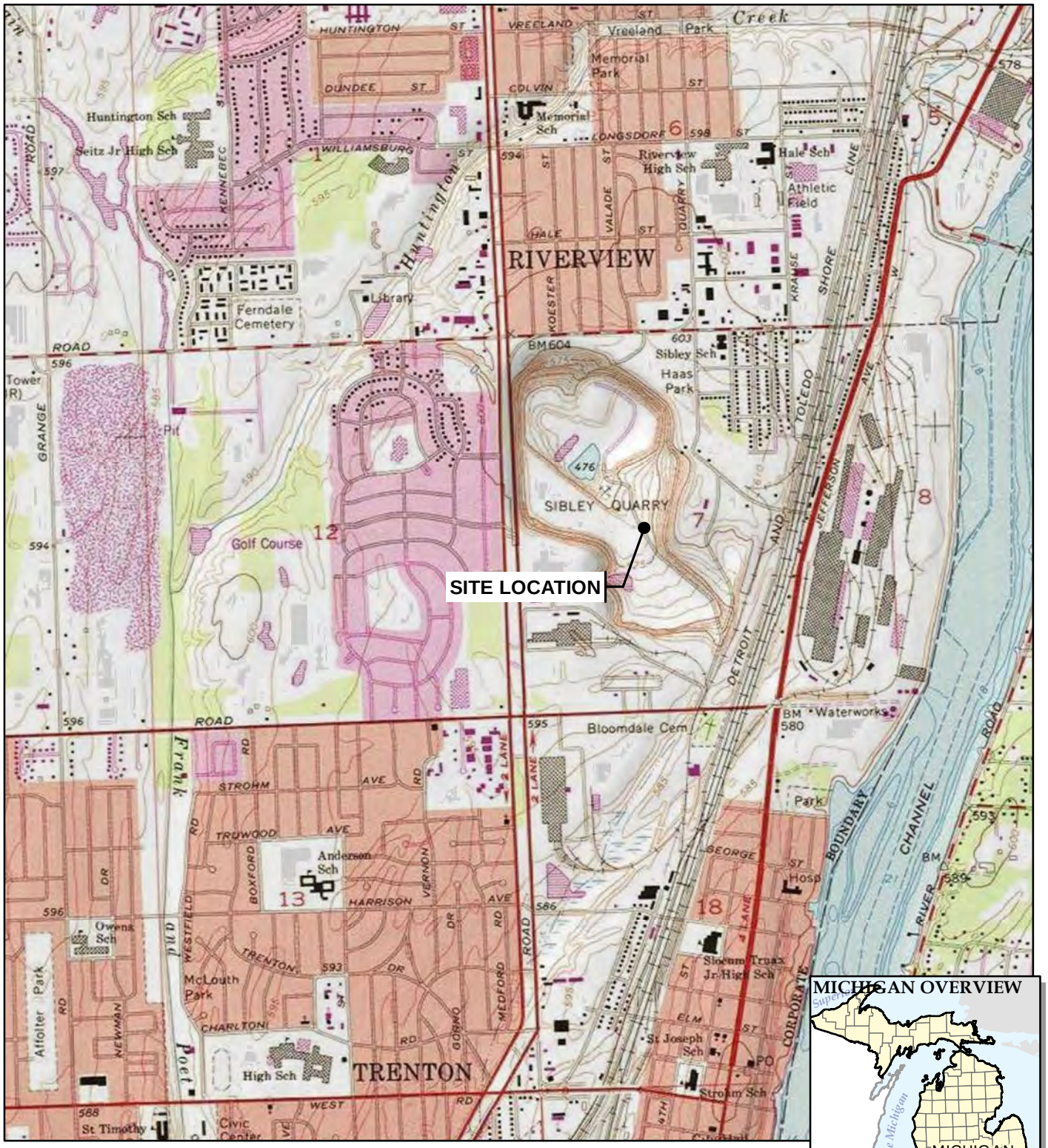
RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

(1) - Concentration addressed through initial alternate source demonstration.

(2) - Results shown for verification sampling performed on 11/12/2019.

(3) - New successful alternative source demonstration was completed following confirmation of the initial statistically significant exceedance.

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 2,000 4,000
FEET

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TRC - GIS

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY LANDFILL
803 FORT STREET
TRENTON, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	M. VAPHIADIS
CHECKED BY:	S. HOLMSTROM
APPROVED BY:	V. BUENING
DATE:	JANUARY 2020
PROJ. NO.:	320511.0002
FILE:	320511-0002-SLMMB.mxd

FIGURE 1

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LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 FILL AREA DESIGNATION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 4/23/2019.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANUARY 2017.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

DTE ELECTRIC COMPANY
SIBLEY QUARRY LANDFILL
801 FORT STREET
TRENTON, MICHIGAN

TITLE:

MONITORING NETWORK AND SITE PLAN

DRAWN BY:	S. MAJOR	PROJ NO.:	320511.0002
CHECKED BY:	B. YELEN		
APPROVED BY:	V. BUENING		**FIGURE 2**
DATE:	JANUARY 2020		

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FILE NO.: 320511-0002-028-Fig02.mxd

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

TRC - GIS

MW-107
(453.70)

450

400

350

MW-103
(433.43)

3

QUARRY BOTTOM
WATER ELEVATION
~304 FT MSL

MW-102
(374.65)

1

MW-106
(420.90)

MW-101
(439.80)

4

500

3

550

MW-104
(487.85)

500

MW-105
(570.95)

4

MW-108
(Abandoned)

MW-108A
(539.84)

550

N 5,000
N 4,000
N 3,000
N 2,000
N 1,000
N 0
E 0
E 1,000
E 2,000
E 3,000

LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 — FILL AREA DESIGNATION
- (439.08) — GROUNDWATER ELEVATION (FT NGVD 1929)
- POTENTIOMETRIC SURFACE CONTOUR (50-FT INTERVAL, DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 4/23/2019.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANURARY 2017.
4. GROUNDWATER ELEVATIONS DISPLAY ED IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY
801 FORT STREET
TRENTON, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP MARCH 2019

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0002
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	JANUARY 2020		

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FILE NO.: 320511-0002-029-Fig03.mxd

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Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
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LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 — FILL AREA DESIGNATION
- (439.08) — GROUNDWATER ELEVATION (FT NGVD 1929)
- POTENTIOMETRIC SURFACE CONTOUR (50-FT INTERVAL, DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 4/23/2019.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANURARY 2017.
4. GROUNDWATER ELEVATIONS DISPLAY ED IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY
801 FORT STREET
TRENTON, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2019

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0002
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	JANUARY 2020		

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FILE NO.: 320511-0002-030-Fig04.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
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Path: E:\DTE\CCR_Sites\2017_265996\320511-0002-030-Fig04.mxd

Appendix A
Alternate Source Demonstration: First Semiannual Detection Monitoring Sampling Event

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Technical Memorandum

Date: August 8, 2019

To: Christopher P. Scieszka
DTE Electric Company

From: Graham Crockford, TRC
David McKenzie, TRC

Project No.: 320511.0002.0000 Phase 001, Task 001

Subject: Alternate Source Demonstration: 2019 First Semiannual Detection Monitoring Sampling Event Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan

Introduction

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). The CCR Rule, which became effective on October 19, 2015, applies to the DTE Electric Company (DTE Electric) Sibley Quarry Coal Combustion Residual Landfill (SQLF) CCR unit.

TRC Engineers Michigan, Inc. (TRC) conducted the first semiannual 2019 detection monitoring event for the SQLF on behalf of DTE Electric on March 27 and 28, 2019 in accordance with the CCR Groundwater Monitoring and Quality Assurance Project Plan – *DTE Electric Company Sibley Quarry Coal Ash Landfill* (QAPP) (TRC, August 2016; Revised March 2017). The semiannual groundwater monitoring event included statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule). This event was the fourth detection monitoring event performed to comply with §257.94. 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. The statistical analysis was performed pursuant to §257.93(f) and (g), and in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, 2017).

The statistical evaluation of the March 2019 Appendix III indicator parameters showed potential SSIs over background for:

- Boron at MW-101 and MW-106

Verification sampling conducted in May 2019 confirmed the SSI for boron at MW-101. The boron concentration at MW-106 is a continued exceedance of the prediction limit that has been demonstrated to be from natural variability and is not from the CCR unit as presented in the *Alternate*

Source Demonstration: 2017 Initial Detection Monitoring Sampling Event Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan, dated April 12, 2018. All other Appendix III constituents were within the statistical background limits.

In accordance with §257.94(e)(2), 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 evaluate the potential SSIs identified in the March 2019 detection monitoring event.

Background

The SQLF is located in Section 7, Township 4 South, Range 11 East, at 801 Fort Street in Trenton, Wayne County, Michigan. The site location is shown in Figure 1. The former limestone quarry began operations in the mid-1800s, and was mined to over 300 feet below ground surface (ft bgs). Quarry dewatering activities were necessary to facilitate limestone mining. The groundwater elevation is currently maintained at a depth of approximately 300 ft bgs. In 1951, Detroit Edison (now DTE Electric) acquired the quarry for the purpose of CCR landfilling. (TRC, January 2018). The SQLF is approximately 207 acres with 92.1 acres designated for CCR landfill development (TRC, October 2017).

The SQLF resides in an area characterized by near surface deposits of glacio-lacustrine clay and silt units on top of thick strata of dolomite and limestone bedrock. The clay-rich soil directly beneath the CCR unit ranges in thickness between 16.5 and 74.5 ft bgs. Limestone bedrock strata underlaying the clay-rich soil extends to over 310 ft bgs and is considered the uppermost aquifer at the site (TRC, January 2018). The CCR detection monitoring well network for the SQLF currently consists of eight monitoring wells installed in the uppermost aquifer, details for which can be found in the *Groundwater Monitoring System Summary Report – DTE Electric Sibley Quarry Coal Combustion Residual Landfill* (TRC, October 2017). Monitoring well locations are shown in Figure 2.

Due to the dewatering of the quarry, at a rate of approximately 1.5 million gallons per day (MGD), groundwater levels are significantly lower within the bedrock monitoring wells that are closest to the quarry. The pumping creates an inward hydraulic gradient, and prevents groundwater contact with the CCR material. All CCR monitoring network wells are therefore considered upgradient of the CCR disposal unit. Based on the site specific hydrogeological conditions, the uppermost aquifer cannot be affected by CCR disposal operations. A current potentiometric map of the site is provided in Figure 3.

Alternate Source Demonstration

Verification resampling was performed as recommended per the Statistical Evaluation 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 rules. Per the Statistical Evaluation 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. As such, verification resampling was conducted on May 8, 2019, by TRC personnel. Groundwater samples were collected in accordance with the Quality Assurance Project Plan (TRC, August 2016; Revised March 2017). A summary of the groundwater data collected during the verification resampling event is provided on Table 1. The associated data quality review is included in Attachment A. The verification resampling confirmed the exceedance for boron at MW-101

The following discussion presents the Alternative Source Demonstration (ASD) for the confirmed prediction limit exceedance for boron at MW-101. As mentioned above, quarry dewatering activities strongly support that Appendix III concentrations in groundwater are from a source other than the SQLF CCR unit. Prior to CCR landfilling operations beginning at the Sibley Quarry in 1951, dewatering has occurred via a sump in the bottom of the 300 foot deep excavation. The groundwater discharge rate is kept at approximately 1.5 MGD to maintain the water level at the bottom of the quarry at approximately 300 ft bgs. Dewatering operations are expected to continue, ensuring that no direct contact between the groundwater and the CCR waste occurs, and that an inward hydraulic gradient will be maintained, preventing CCR constituents from migrating off site in the event of a release. As a result of dewatering activities, the groundwater monitoring wells are all upgradient and it is likely that changes in groundwater constituent concentrations are derived from natural conditions within the aquifer. Additional supporting lines of evidence specific to the SSI are presented below.

Boron at MW-101: The boron concentrations in the groundwater at MW-101, shown graphically as data points greater than the prediction limit in Figure 4, is likely the result of natural variability or statistical error and not the release of CCR constituents from the SQLF CCR unit. Multiple lines of evidence are provided in support of this conclusion and are as follows:

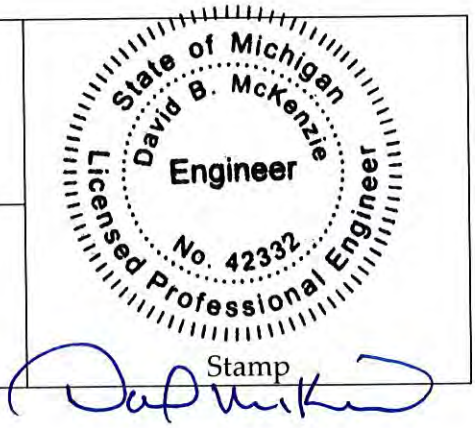
- **Site-wide background concentrations of boron** – Considering all eight background monitoring events for the groundwater monitoring well network at the SQLF, boron concentrations fluctuate by two to three orders of magnitude. The lowest measured boron concentration, at MW-102 on September 29, 2016, is reported as 83 micrograms/liter (µg/L), the highest measured boron concentration, at MW-105 on August 10, 2016, is reported as 2,500 µg/L. The SSI concentration of boron measured in MW-101 during the March 2019 detection monitoring event is reported as 290 µg/L and 370 µg/L in the May 2019 confirmation sample, well within the range of site-wide background levels for boron.
- **Insufficient background sampling timeline to account for long-term trends** – Variability in boron concentrations observed in the groundwater at the SQLF during the background sampling events provides evidence of the heterogeneity of this constituent in groundwater. The short duration of the background sampling events limited the ability of the statistical analysis to capture temporal trends in the groundwater quality at the SQLF.

Conclusions and Recommendations

The information provided in this report serves as the ASD for the DTE Electric SQLF CCR unit. This report was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule, and demonstrates that the SSIs detected during the first semiannual detection monitoring event performed in 2019 are 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 per 40 CFR 257.94 at the SQLF CCR unit.

Certification Statement

I hereby certify that the alternative source demonstration presented within this document for the SQLF CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 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 §257.94(e) 2.

Name: David B. McKenzie, P.E.	Expiration Date: October 31, 2019	 Stamp
Company: TRC Engineers Michigan, Inc.	Date: 8/8/19	

References

Golder Associates. October 2015. Closure Evaluation Sibley Quarry – Trenton, Michigan. Prepared for DTE Electric.

Reeves, Howard W., Kirsten V. Wright, and J. R. Nicholas, 2004. Hydrogeology and Simulation of Regional Ground-Water-Level Declines in Monroe County, Michigan: U.S. Geological Survey Water-Resources Investigations Report 03-4312, 72 p. Date Posted: May 24, 2007

TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill, 801 Fort Street, Trenton, Michigan. Prepared for DTE Electric Company.

TRC Environmental. October 2017. Groundwater Monitoring System Summary Report – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill, 801 Fort Street, Trenton, Michigan. Prepared for DTE Electric Company.

TRC Environmental. January 31, 2018. Technical Memorandum – Sibley Quarry Landfill Background Data, RCRA CCR Monitoring, Trenton, Michigan.

Attachments

Table 1. Comparison of Verification Sampling Results to Background Limits

Figure 1. Site Location Map
Figure 2. Monitoring Network and Site Plan
Figure 3. Groundwater Potentiometric Surface Map – March 2019
Figure 4. MW-101 Boron Time Series Plot

Attachment A. Data Quality Review

Table 1

Table 1
Comparison of Verification Sampling Results to Background Limits
Sibley Quarry Landfill - RCRA CCR Monitoring Program
Trenton, Michigan

		Sample Location:	MW-101
		Sample Date:	5/8/2019
Constituent	Unit	Data	PL
Appendix III			
Boron	ug/L	**370**	280

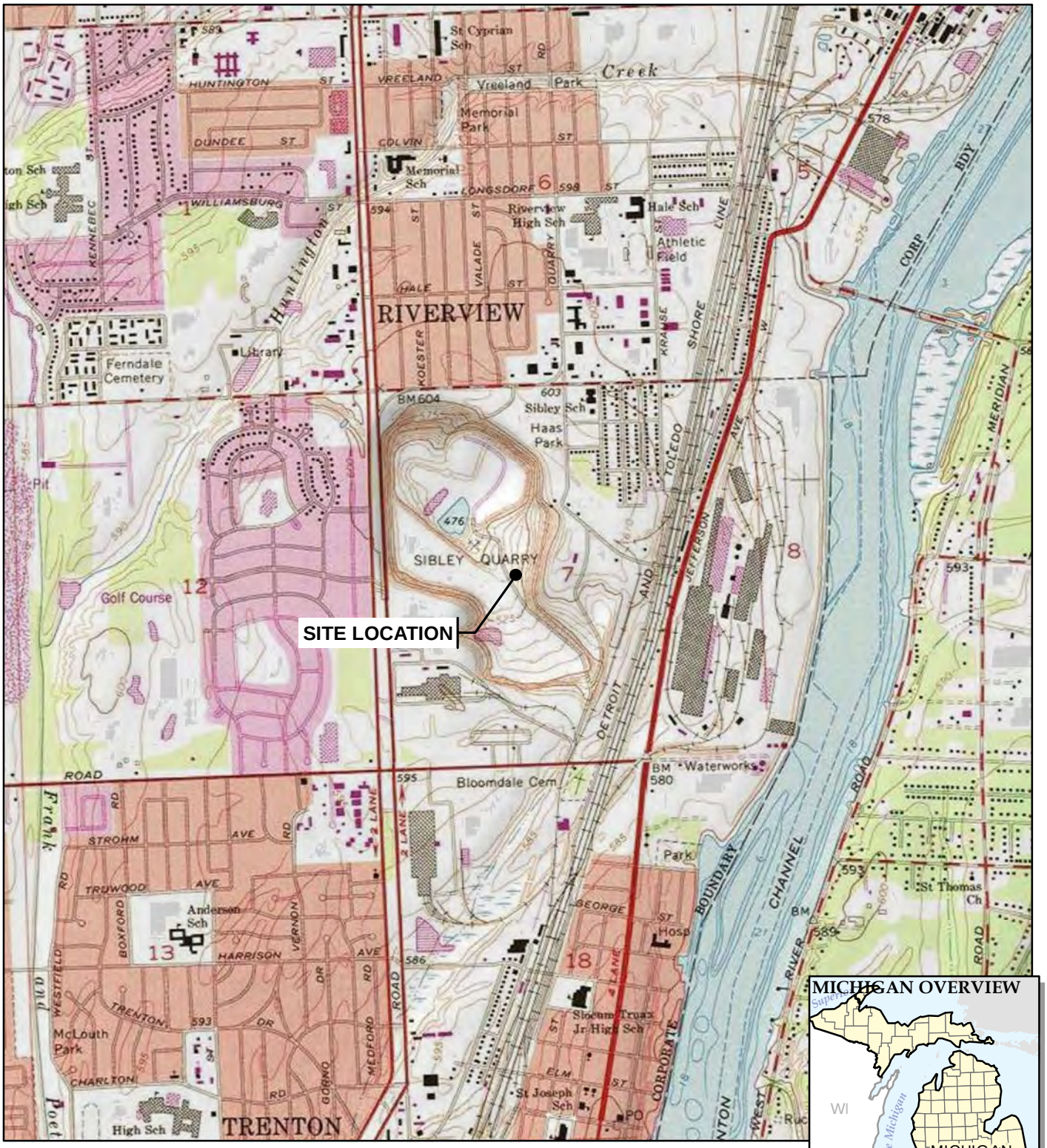
Notes:

ug/L - micrograms per liter.

All metals were analyzed as total unless otherwise specified.

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

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 2,000 4,000
FEET

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TRC - GIS

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY LANDFILL
803 FORT STREET
TRENTON, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	J PAPEZ
CHECKED BY:	S HOLMSTROM
APPROVED BY:	V BUENING
DATE:	AUGUST 2019
PROJ. NO.:	320511.0002
FILE:	320511.0002-001slmMB.mxd

FIGURE 1

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LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 FILL AREA DESIGNATION

NOTES

1. BASE MAP IMAGERY FROM ESRI/MICROSOFT, "WORLD IMAGERY", WEB BASEMAP SERVICE LAYER, 2011.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANUARY 2017.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY LANDFILL
801 FORT STREET
TRENTON, MICHIGAN

TITLE:
MONITORING NETWORK AND SITE PLAN

DRAWN BY:	SUEMNICHT R	PROJ NO.:	320511.0002
CHECKED BY:	S HOLMSTROM		
APPROVED BY:	BUENING V		
DATE:	AUGUST 2019		

FIGURE 2

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FILE NO.: 320511-0002-017.mxd

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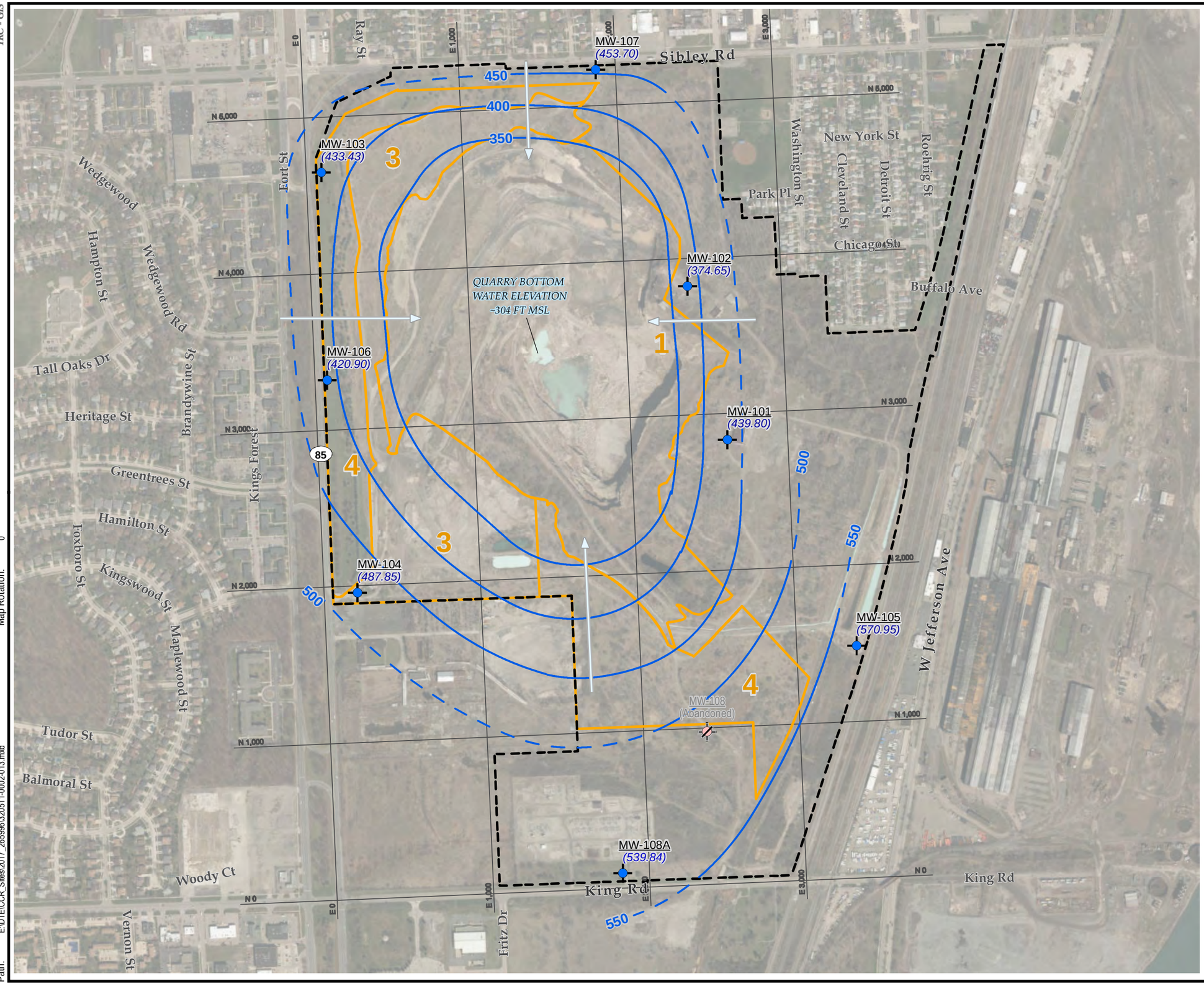
TRC - GIS



LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 — FILL AREA DESIGNATION
- (439.08) — GROUNDWATER ELEVATION (FT NGVD 1929)
- POTENTIOMETRIC SURFACE CONTOUR (50-FT INTERVAL, DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP IMAGERY FROM ESRI/MICROSOFT, "WORLD IMAGERY", WEB BASEMAP SERVICE LAYER, 2011.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANURARY 2017.
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY
801 FORT STREET
TRENTON, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP MARCH 2019

DRAWN BY:	A. ADAIR	PROJ NO.:	320511.0002
CHECKED BY:	M. BREHOB		
APPROVED BY:	S. HOLMSTROM		**FIGURE 3**
DATE:	AUGUST 2019		

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FILE NO.: 320511-0002-013.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
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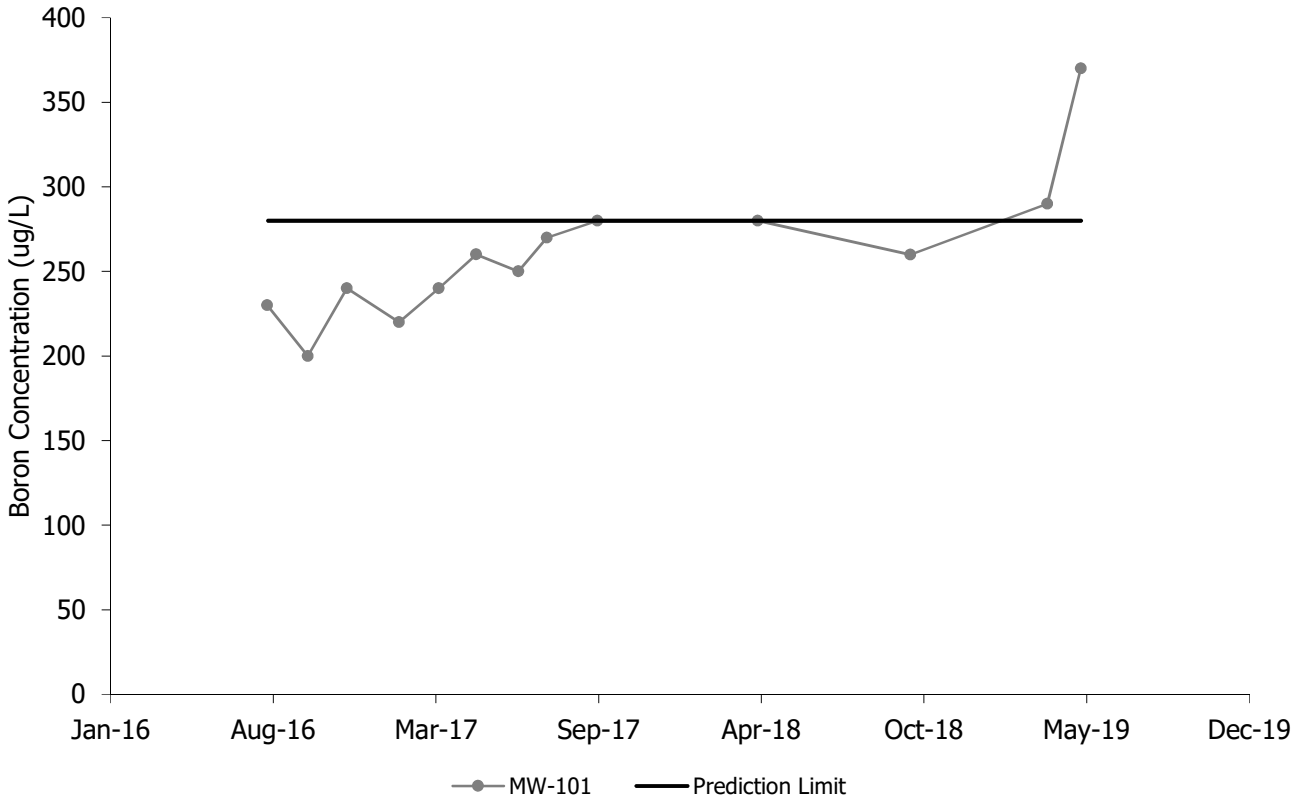
Figure 4
MW-101 Boron Time Series Plot
Sibley Quarry Landfill - RCRA CCR Monitoring Program



Attachment A
Data Quality Review

Laboratory Data Quality Review
Groundwater Monitoring Event May 2019 (Verification Resampling)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

On May 8, 2019, TRC Environmental Corporation (TRC) collected groundwater samples at MW-101 to verify analytical results that were outside of the prediction limits during the March 2019 detection monitoring event. Samples were analyzed by Test America Laboratories, Inc. (Test America), located in Canton, Ohio for metals (6010B). The laboratory analytical results are reported in laboratory report J112498-1.

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, 2017). 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;
- Data for method blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures;
- Reporting limits (RLs) compared to project-required RLs;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for laboratory duplicates. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method; 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.

QA/QC Sample Summary:

- Target analytes were not detected in the method blank.
- LCS recoveries were within laboratory control limits.
- Dup-01 corresponds with MW-101; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Data are usable for purposes of verification sampling.

Appendix B
Alternate Source Demonstration: Second Semiannual Detection Monitoring Sampling Event

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Technical Memorandum

Date: January 30, 2020

To: Christopher P. Scieszka
DTE Electric Company

From: Graham Crockford, TRC
David McKenzie, TRC

Project No.: 320511.0002.0000 Phase 001, Task 001

Subject: Alternate Source Demonstration: 2019 Second Semiannual Detection Monitoring Sampling Event Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan

Introduction

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). The CCR Rule, which became effective on October 19, 2015, applies to the DTE Electric Company (DTE Electric) Sibley Quarry Coal Combustion Residual Landfill (SQLF) CCR unit.

TRC Engineers Michigan, Inc. (TRC) conducted the second semiannual 2019 detection monitoring event for the SQLF on behalf of DTE Electric on September 24, 25, and 26, 2019 in accordance with the CCR Groundwater Monitoring and Quality Assurance Project Plan – *DTE Electric Company Sibley Quarry Coal Ash Landfill* (QAPP) (TRC, August 2016; Revised March 2017). The semiannual groundwater monitoring event included the statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule). This event was the fifth detection monitoring event performed to comply with §257.94. 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. The statistical analysis was performed pursuant to §257.93(f) and (g), and in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, 2017).

The statistical evaluation of the September 2019 Appendix III indicator parameters showed a potential SSI over background for:

- Boron at MW-106; and Chloride and Sulfate at MW-108A.

Verification sampling conducted in November 2019 confirmed the SSI for sulfate at MW-108A. The boron concentration at MW-106 and the chloride concentration at MW-108A are a continued exceedance of their respective prediction limits that have been demonstrated to be from natural variability and is not from the CCR unit as presented in the *Alternate Source Demonstration: 2017 Initial Detection Monitoring Sampling Event Sibley Quarry Coal Combustion Residual Landfill, Trenton, Michigan*, dated April 12, 2018.All other Appendix III constituents were within the statistical background limits.

In accordance with §257.94(e)(2), 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 SSIs identified in the September 2019 detection monitoring event.

Background

The SQLF is located in Section 7, Township 4 South, Range 11 East, at 801 Fort Street in Trenton, Wayne County, Michigan. The site location is shown in Figure 1. The former limestone quarry began operations in the mid-1800s, and was mined to over 300 feet below ground surface (ft bgs). Quarry dewatering activities were necessary to facilitate limestone mining. The groundwater elevation is currently maintained at a depth of approximately 300 feet below ground surface. In 1951, Detroit Edison (now DTE Electric) acquired the quarry for the purpose of CCR landfilling. (TRC, January 2018). The SQLF is approximately 207 acres with 92.1 acres designated for CCR landfill development (TRC, October 2017).

The SQLF resides in an area characterized by near surface deposits of glacio-lacustrine clay and silt units on top of thick strata of dolomite and limestone bedrock. The clay-rich soil directly beneath the CCR unit ranges in thickness between 16.5 and 74.5 ft bgs. Limestone bedrock strata underlaying the clay-rich soil extends to over 310 ft bgs and is considered the uppermost aquifer at the site (TRC, January 2018). The CCR detection monitoring well network for the SQLF currently consists of eight monitoring wells installed in the uppermost aquifer, details for which can be found in the *Groundwater Monitoring System Summary Report – DTE Electric Sibley Quarry Coal Combustion Residual Landfill* (TRC, October 2017). Monitoring well locations are shown in Figure 2.

Due to the dewatering of the quarry, at a rate of approximately 1.5 million gallons per day (MGD), groundwater levels are significantly lower within the bedrock monitoring wells that are closest to the quarry. The pumping creates an inward hydraulic gradient, and prevents groundwater contact with the CCR material. All CCR monitoring network wells are therefore considered upgradient of the CCR disposal unit. Based on the site-specific hydrogeological conditions, the uppermost aquifer cannot be affected by CCR disposal operations. A current potentiometric map of the site is provided in Figure 3.

Alternate Source Demonstration

Verification resampling was performed as recommended per the Statistical Evaluation 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 rules. Per the Statistical Evaluation 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. As such, verification resampling was conducted on November 12, 2019, by TRC personnel, and a groundwater sample was collected in accordance with the Quality Assurance Project Plan (TRC, August 2016; Revised March 2017). A summary of the groundwater data collected during the verification resampling event is provided on Table 1. The associated data quality review is included in Attachment A.

The verification resampling confirmed the exceedance for sulfate at MW-108A.

The following discussion presents the Alternative Source Demonstration (ASD) for the confirmed prediction limit exceedance for sulfate at MW-108A. As mentioned above, quarry dewatering activities strongly support that Appendix III concentrations in groundwater are from a source other than the SQLF CCR unit. Prior to CCR landfilling operations beginning at the Sibley Quarry in 1951, dewatering has occurred via a sump in the bottom of the 300-foot-deep excavation. The groundwater discharge rate is kept at approximately 1.5 MGD to maintain the water level at the bottom of the quarry at approximately 300 ft bgs. Dewatering operations are expected to continue, ensuring that no direct contact between the groundwater and the CCR waste occurs, and that an inward hydraulic gradient will be maintained, preventing CCR constituents from migrating off site in the event of a release. As a result of dewatering activities, the groundwater monitoring wells are all upgradient and it is likely that changes in groundwater constituent concentrations are derived from natural conditions within the aquifer. Additional supporting lines of evidence specific to the SSI are presented below.

Sulfate at MW-108A: The SSI of sulfate in the groundwater at MW-108A, shown graphically as data points greater than the prediction limit in Figure 4, is likely the result of natural variability in the groundwater quality or statistical error and not the release of CCR constituents from the SQLF CCR unit. Multiple lines of evidence are provided in support of this conclusion and are as follows:

- **Dominant groundwater type** – Groundwater at the SQLF is from a fractured limestone and dolomite formation underlain by a sulfur-rich sandstone formation. This is apparent in the background monitoring data for the monitoring wells at the SQLF, which provide a reported range of sulfate concentrations from 540 mg/L to 3,800 mg/L. The SSI concentration of sulfate measured in MW-108A during both the September 2019 detection monitoring event and the November 2019 verification resample is reported as1,200 mg/L, well within the range of background variation at the SQLF.

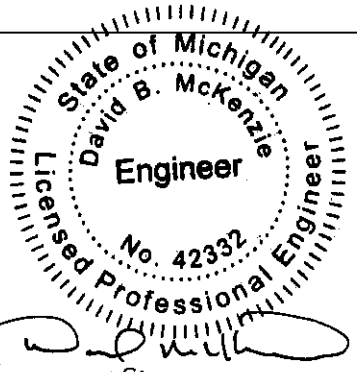
- **Insufficient background sampling timeline to account for long-term trends** – Variability in sulfate concentrations observed in the groundwater at SQLF during the background sampling events provides evidence of the heterogeneity of this constituent in groundwater. The short duration of the background sampling events limited the ability of the statistical analysis to capture the temporal trends in the groundwater quality at the SQLF.

Conclusions and Recommendations

The information provided in this report serves as the ASD for the DTE Electric SQLF CCR unit. This report was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and demonstrates that the SSI detected during the second semiannual detection monitoring event performed in 2019 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 per 40 CFR 257.94 at the SQLF CCR unit.

Certification Statement

I hereby certify that the alternative source demonstration presented within this document for the SQLF CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 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 §257.94(e) 2.

Name: David B. McKenzie, P.E.	Expiration Date: October 31, 2021	 Stamp
Company: TRC Engineers Michigan, Inc.	Date: January 30, 2020	

References

Golder Associates. October 2015. Closure Evaluation Sibley Quarry – Trenton, Michigan. Prepared for DTE Electric.

Reeves, Howard W., Kirsten V. Wright, and J. R. Nicholas, 2004. Hydrogeology and Simulation of Regional Ground-Water-Level Declines in Monroe County, Michigan: U.S. Geological Survey Water-Resources Investigations Report 03-4312, 72 p. Date Posted: May 24, 2007

TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill, 801 Fort Street, Trenton, Michigan. Prepared for DTE Electric Company.

TRC Environmental. October 2017. Groundwater Monitoring System Summary Report – DTE Electric Company Sibley Quarry Coal Combustion Residual Landfill, 801 Fort Street, Trenton, Michigan. Prepared for DTE Electric Company.

TRC Environmental. January 31, 2018. Technical Memorandum – Sibley Quarry Landfill Background Data, RCRA CCR Monitoring, Trenton, Michigan.

Attachments

Table 1 Comparison of Verification Sampling Results to Background Limits

Figure 1 Site Location Map
Figure 2 Monitoring Network and Site Plan
Figure 3 Groundwater Potentiometric Surface Map – September 2019
Figure 4 MW-108A Sulfate Time Series Plot

Attachment A Data Quality Review

Table 1

Table 1
Comparison of Verification Sampling Results to Background Limits
Sibley Quarry Landfill – RCRA CCR Monitoring Program
Trenton, Michigan

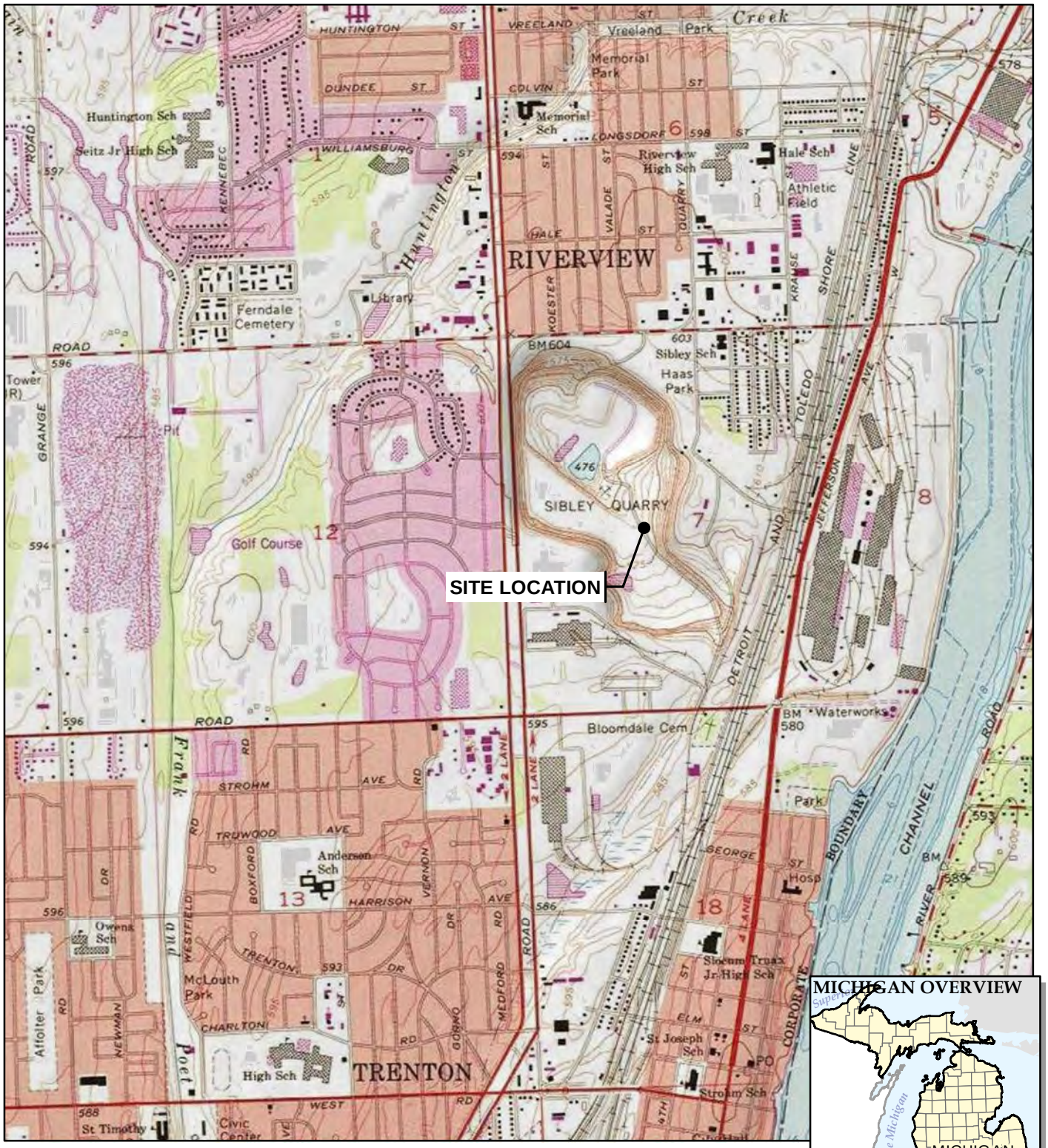
	Sample Location:	MW-108A	
	Sample Date:	11/12/2019	
Constituent	Unit	Data	PL
Appendix III			
Sulfate	mg/L	**1,200**	1,100

Notes:

mg/L - milligrams per liter

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

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
SIBLEY QUARRY LANDFILL
803 FORT STREET
TRENTON, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	M. VAPHIADIS
CHECKED BY:	S. HOLMSTROM
APPROVED BY:	V. BUENING
DATE:	JANUARY 2020
PROJ. NO.:	320511.0002
FILE:	320511-0002-SLMMB.mxd

FIGURE 1

E:\DTE\CCR_Sites\2017_265996\320511-0002-SLMMB.mxd -- Saved By: MVAPHIADIS on 1/7/2020, 14:42:57 PM

LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 FILL AREA DESIGNATION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 4/23/2019.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANUARY 2017.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

DTE ELECTRIC COMPANY
SIBLEY QUARRY LANDFILL
801 FORT STREET
TRENTON, MICHIGAN

TITLE:

MONITORING NETWORK AND SITE PLAN

DRAWN BY:	S. MAJOR	PROJ NO.:	320511.0002
CHECKED BY:	B. YELEN		
APPROVED BY:	V. BUENING		**FIGURE 2**
DATE:	JANUARY 2020		

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www.trccompanies.com

FILE NO.: 320511-0002-028-Fig02.mxd

Plot Date: 1/28/2020, 11:12:18 AM by MVAPHIADIS – LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\320511-0002-028-Fig02.mxd

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

TRC - GIS

MW-107
(453.70)

450

400

350

MW-103
(433.43)

3

QUARRY BOTTOM
WATER ELEVATION
~304 FT MSL

MW-102
(374.65)

1

MW-106
(420.90)

MW-101
(439.80)

4

500

3

550

MW-104
(487.85)

500

MW-105
(570.95)

4

MW-108
(Abandoned)

MW-108A
(539.84)

550

N 5,000
N 4,000
N 3,000
N 2,000
N 1,000
N 0
E 0
E 1,000
E 2,000
E 3,000

LEGEND

- MONITORING WELLS
- DECOMMISSIONED MONITORING WELL
- SIBLEY QUARRY PROPERTY LINE
- SOLID WASTE DISPOSAL AREA BOUNDARY
- 1 — FILL AREA DESIGNATION
- (439.08) — GROUNDWATER ELEVATION (FT NGVD 1929)
- POTENTIOMETRIC SURFACE CONTOUR (50-FT INTERVAL, DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 4/23/2019.
2. SITE LAYOUT INFORMATION FROM GEOREFERENCED CAD FILE. FEATURES ARE APPROXIMATE.
3. SURVEY PERFORMED BY THE DTE SURVEY GROUP IN AUGUST 2015, MAY 2016 AND JANURARY 2017.
4. GROUNDWATER ELEVATIONS DISPLAY ED IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
SIBLEY QUARRY
801 FORT STREET
TRENTON, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP MARCH 2019

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0002
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	JANUARY 2020		

TRC
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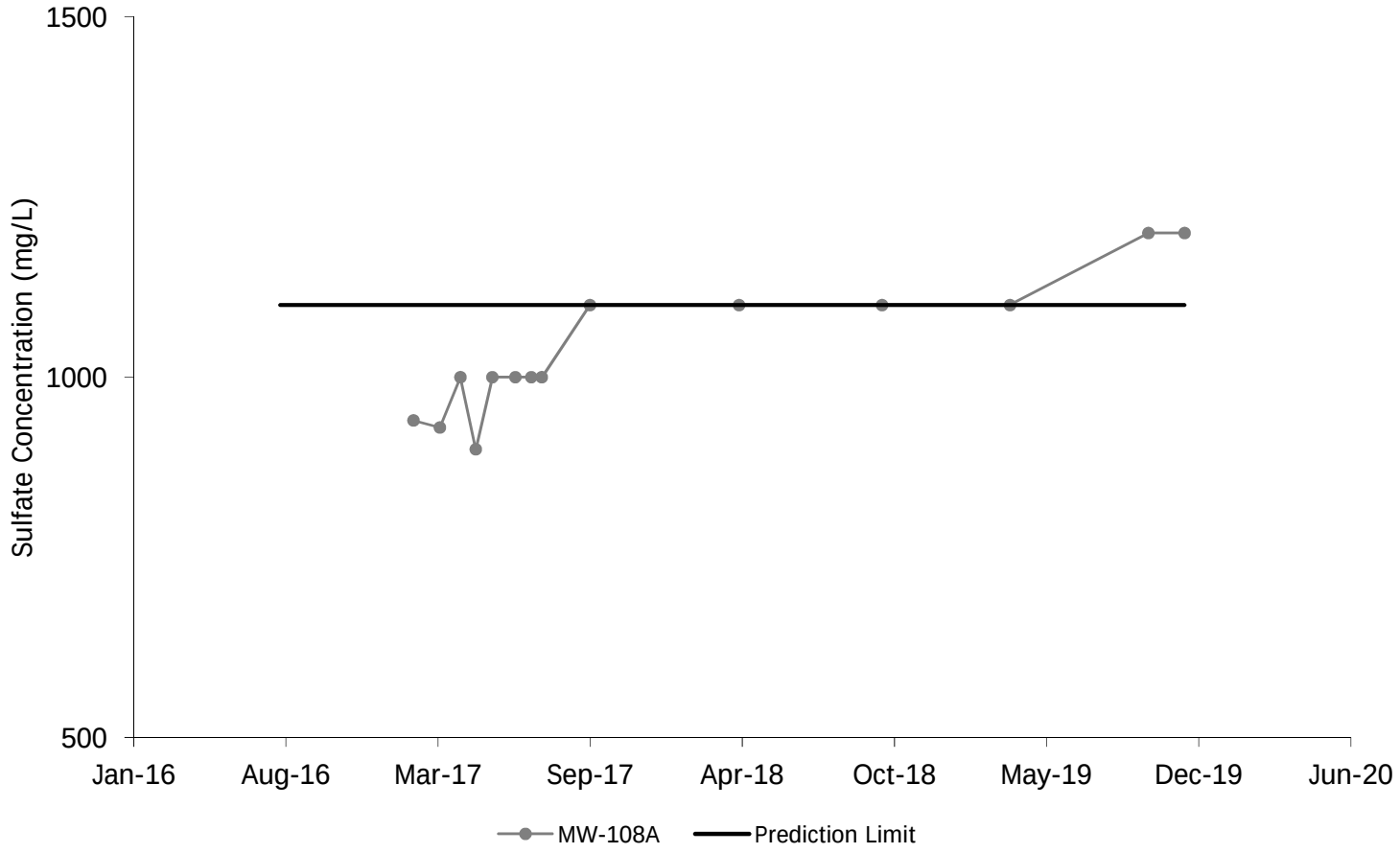
FILE NO.: 320511-0002-029-Fig03.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
Plot Date: 1/28/2020, 11:23:00 AM by MVAPHIADIS -- LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\320511-0002-029-Fig03.mxd

FIGURE 4

MW-108A SULFATE TIME SERIES PLOT



Attachment A
Data Quality Review

Laboratory Data Quality Review
Groundwater Monitoring Event
November 2019 (Verification Resampling)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

Groundwater samples were collected by TRC for the November 2019 verification event. Samples were analyzed for anions by Eurofins Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-122289-1.

During the November 2019 verification sampling event, a groundwater sample was collected from each of the following wells on November 12, 2019:

- MW-106
- MW-108A

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride (MW-106), Sulfate (MW-108A)	SW846 9056A

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, 2017). 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). 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. 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:

- Target analytes were not detected in the method blank.

- LCS recoveries for all target analytes were within laboratory control limits.

- MS/MSD analyses were not performed on a sample from the data set.

- DUP-01_20191112 corresponds with MW-106_20191112; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits. DUP-02_20191112 corresponds with MW-108A_20191112; RPDs between the parent and duplicate sample were within the QC limits.

Appendix C
Data Quality Review

Laboratory Data Quality Review
Groundwater Monitoring Events
March and April 2019 (Detection Monitoring)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

Groundwater samples were collected by TRC for the Sibley Quarry Landfill March and April 2019 sampling event. Samples were analyzed for anions, boron, calcium, 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 reports 240-110200-1 and 240-111195-1.

During the March and April 2019 sampling event, a groundwater sample was collected from each of the following wells:

- MW-101
- MW-102
- MW-103
- MW-104
- MW-105
- MW-106
- MW-107
- MW-108A

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Boron	SW846 3005A/6010B
Total 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, 2017). 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, field blanks, and equipment blanks, if applicable. 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). 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), if 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, if 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:

- The holding time for TDS for samples MW-106, MW-107, and DUP-01 (paired with MW-107) exceeded the 7-day holding time criteria by approximately one to 3.5 hours. The positive results for TDS in these samples are estimated and may be biased low (see attached Table).
- No field or equipment blanks were submitted with this data set.
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- The field duplicate pair samples were DUP-01 and MW-107. The relative percent differences (RPDs) between the parent and duplicate sample were within the acceptance limits except for calcium. The RPD for calcium was 77%; thus, the positive results for calcium in all samples in this data set are estimated (see attached Table).

- MS/MSD analyses were performed on sample MW-103 for anions; the percent recoveries (%Rs) and RPDs were within the acceptance limits.
- MS/MSD analyses were not performed for boron and calcium in this SDG. Per the project QAPP, MS/MSD analyses are required for boron, calcium, and anions at a frequency of 1 per 20 samples.

Laboratory Data Quality Review
Groundwater Monitoring Event May 2019 (Verification Resampling)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

On May 8, 2019, TRC Environmental Corporation (TRC) collected groundwater samples at MW-101 to verify analytical results that were outside of the prediction limits during the March 2019 detection monitoring event. Samples were analyzed by Test America Laboratories, Inc. (Test America), located in Canton, Ohio for metals (6010B). The laboratory analytical results are reported in laboratory report J112498-1.

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, 2017). 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;
- Data for method blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures;
- Reporting limits (RLs) compared to project-required RLs;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for laboratory duplicates. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method; 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.

QA/QC Sample Summary:

- Target analytes were not detected in the method blank.
- LCS recoveries were within laboratory control limits.
- Dup-01 corresponds with MW-101; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Data are usable for purposes of verification sampling.

Laboratory Data Quality Review
Groundwater Monitoring Event September 2019 (Detection Monitoring)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

Groundwater samples were collected by TRC for the September 2019 sampling event. Samples were analyzed for anions, total boron, total calcium, 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 reports 240-119638-1 and 240-119700-1.

During the September 2019 sampling event, a groundwater sample was collected from each of the following wells:

- MW-101
- MW-102
- MW-103
- MW-104
- MW-105
- MW-106
- MW-107
- MW-108A

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Boron	SW846 3005A/6010B
Total 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, 2017). 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.

- 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:

- Target analytes were not detected in the method blanks.

- LCS recoveries for all target analytes were within laboratory control limits.

- MS/MSD analyses were performed on sample MW-101 for boron and fluoride; all criteria were met.

  - MS/MSD analyses were not performed for chloride, sulfate, and calcium. Per the project QAPP, MS/MSD analyses are required for chloride, sulfate, and calcium at a frequency of 1 per 20 samples.

- Laboratory duplicate analysis was performed on sample MW-101 for TDS; all criteria were met.

- Dup-01 corresponds with MW-101; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.

- The reporting limit (2.5 mg/L) for the nondetect fluoride result in sample MW-107 was above the QAPP-specified RL (0.05 mg/L) due to a 50-fold dilution as a result of matrix interference (i.e., the elevated concentration of chloride).

Laboratory Data Quality Review
Groundwater Monitoring Event
November 2019 (Verification Resampling)
DTE Electric Company Sibley Quarry Landfill (DTE SQLF)

Groundwater samples were collected by TRC for the November 2019 verification event. Samples were analyzed for anions by Eurofins Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-122289-1.

During the November 2019 verification sampling event, a groundwater sample was collected from each of the following wells on November 12, 2019:

- MW-106
- MW-108A

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride (MW-106), Sulfate (MW-108A)	SW846 9056A

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, 2017). 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). 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. 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:

- Target analytes were not detected in the method blank.

- LCS recoveries for all target analytes were within laboratory control limits.

- MS/MSD analyses were not performed on a sample from the data set.

- DUP-01_20191112 corresponds with MW-106_20191112; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits. DUP-02_20191112 corresponds with MW-108A_20191112; RPDs between the parent and duplicate sample were within the QC limits.