2020 Annual Groundwater Monitoring Report

St. Clair Power Plant Bottom Ash Basins
4901 Pointe Drive
East China Township, Michigan

January 2021

Prepared For:

DTE Electric Company

Prepared By:

TRC
1540 Eisenhower Place
Ann Arbor, Michigan 48108

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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

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. The CCR Rule, which became effective on October 19, 2015 (with amendments in 2018 and 2020), applies to the DTE Electric Company (DTE Electric) St. Clair Power Plant (SCPP) Bottom Ash Basins (BABs) 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 the calendar year 2020 activities at the SCPP BABs CCR Unit.

DTE Electric remained in detection monitoring at the SCPP BABs CCR unit in 2020. The semiannual detection monitoring events for 2020 were completed in March and September 2020 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 2020 are presented in this report.

No SSIs were recorded for the 2020 monitoring period and detection monitoring will be continued at the SCPP BABs CCR unit in accordance with §257.94. In addition, based on the hydrogeology at the Site, with the presence of the vertically and horizontally extensive clay-rich confining till beneath the SCPP BABs CCR unit, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from operations. 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.

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) St. Clair Power Plant (SCPP) Bottom Ash Basins (BABs). 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 2020 activities at the SCPP BABs CCR unit (2020 Annual Report).

In the *2019 Annual Groundwater Monitoring Report for the St. Clair Power Plant Bottom Ash Basins CCR Unit* (2019 Annual Report) (TRC, January 2020), DTE Electric reported no concentrations over the background limits for any of the Appendix III indicator parameters. Therefore, DTE Electric continued detection monitoring at the SCPP BABs CCR unit in 2020 pursuant to §257.94 of the CCR Rule. This 2020 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 and September 2020 semiannual groundwater monitoring events for the SCPP BABs CCR unit. Detection monitoring for these events continued to be performed in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company St. Clair Power Plant Bottom Ash Basins* (QAPP) (TRC, July 2016; revised August 2017) and statistically evaluated per the *Groundwater Statistical Evaluation Plan – St. Clair Power Plant Coal Combustion Residual Bottom Ash Basins* (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 SCPP BABs are located in Section 19, Township 4 North, Range 17 East, at 4901 Pointe Drive, East China Township in St. Clair County, Michigan. The SCPP including the east BAB was constructed in the early 1950s and the west BAB was constructed in 1996, just south of the DTE Electric SCPP main building. The power plant is located on the peninsula formed by the St. Clair and Belle Rivers, approximately three miles south of St. Clair, Michigan immediately to the west of the St. Clair River.

The property has been used continuously as a coal fired power plant since Detroit Edison Company (now DTE Electric) began power plant operations at SCPP in 1953 and is constructed over a natural continuous clay-rich soil base as shown in historical soil borings performed at the SCPP property. The BABs are designed to manage sluiced bottom ash and other waste streams. The BABs are routinely cleaned out and CCR is disposed at the Range Road Landfill

(RRLF).

The SCPP BABs are two adjacent sedimentation basins that are incised CCR surface impoundments. The impoundments are sheet piled around the perimeters to approximately 13 feet below ground surface (ft bgs) into the native clay-rich soil. The BABs are located south of the SCPP and adjacent to the St. Clair River and are used for receiving bottom ash and other process flow water from the power plant, which is first sent to the East BAB then to the West BAB through a connecting concrete canal. Discharge water from the basins flows with other site wastewater into the Overflow Canal in accordance with a National Pollution Discharge Elimination System (NPDES) permit.

1.3 Geology/Hydrogeology

The SCPP BABs CCR unit is located immediately adjacent to the west edge of the St. Clair River. The SCPP CCR unit is underlain by glacial silty-clay till, with a few isolated sand lenses, and a silt and clay-rich hardpan base directly overlying the shale bedrock (likely the Bedford Shale). The shale bedrock lower confining unit is generally encountered at depths greater than 130 ft bgs. No significant soil or gravel intervals were encountered at any of the groundwater monitoring system well locations. However, during soil boring advancement for the groundwater monitoring system well locations, some signs of saturation were observed throughout a 5-foot interval along the interface between the overlying till/hardpan and the underlying shale bedrock. The underlying shale does not yield groundwater, rather it is an aquiclude that prevents groundwater flow (i.e., is not an aquifer).

Although the encountered zone of saturation along the interface did not yield significant groundwater, it was conservatively interpreted as the first underlying saturated zone that would presumably become affected with CCR constituents, since it was saturated, and although the hydraulic conductivity was low, exhibited a much higher conductivity than the clay-rich soils between the bottom of the basin and the monitored zone. Therefore, the potential uppermost aquifer as described above was present beneath at least 120 feet of vertically contiguous silty clay-rich till that serves as a natural confining hydraulic barrier that isolates the underlying uppermost potential aquifer. The first underlying saturated zone (the potential uppermost aquifer) that would presumably become affected with CCR constituents is located at the silty clay hardpan/shale bedrock interface (130.5 to 132 ft bgs) and is limited to no more than 4 feet thick.

A definitive groundwater flow direction to the east-southeast with a mean gradient of approximately 0.003 foot/foot within the uppermost aquifer is evident around the SCPP CCR BABs CCR unit, however potential groundwater flow within this uppermost aquifer is very low (less than 0.05 feet per year).

In addition, the elevation of CCR-affected water maintained within the SCPP BABs is very similar to the potentiometric surface elevations in the uppermost aquifer at the BABs CCR unit area. This suggests that if the CCR affected surface water in the BABs were able to penetrate the silty clay-rich underlying confining unit, the head on that release likely would travel radially away from the BABs within the uppermost aquifer. However, with the very thick continuous silty

clay-rich confining unit beneath the SCPP, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from SCPP operations that began in the 1950s.

2.0 Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for the SCPP BABs CCR unit as detailed in the *Groundwater Monitoring System Summary Report – DTE Electric Company St. Clair Power Plant Bottom Ash Basins Coal Combustion Residual Unit* (GWMS Report) (TRC, October 2017). The detection monitoring well network for the BABs CCR unit currently consists of four monitoring wells that are screened in the uppermost aquifer. Monitoring wells MW-16-01 through MW-16-04 are located around the east and west perimeter of the BABs and provide data on both background and downgradient groundwater quality that has not been affected by the CCR unit (total of four 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 monitoring event for 2020 was performed during March 18 and 19, 2020 by TRC personnel and samples were analyzed by Eurofins TestAmerica (Eurofins) in accordance with the QAPP. Static water elevation data were collected at all four monitoring well locations. During the March event the groundwater elevation data was collected after the dedicated bladder pumps were removed from the well and was not an accurate measure of the static groundwater conditions. Static water elevations were collected in May so that an accurate measure of the static groundwater conditions could be assessed. Groundwater samples were collected from the four detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the May 2020 event is provided in Table 1 (static groundwater elevation data), Table 2 (field data), and Table 3 (analytical results).

The second semiannual groundwater monitoring event for 2020 was performed during September 14 and 15, 2020 by TRC personnel and samples were analyzed by Eurofins in accordance with the QAPP. Static water elevation data were collected at all four monitoring well locations. Groundwater samples were collected from the four 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 in 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 A.

2.2.3 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the May and September 2020 sampling events show that groundwater within the uppermost aquifer generally flows to the east-southeast across the SCPP BABs CCR unit. Groundwater potentiometric surface elevations measured across the SCPP BABs during the May and September 2020 sampling events are provided in Table 1 and were used to construct the groundwater potentiometric surface maps shown on Figure 3 and Figure 4, respectively. The groundwater flow rate and direction is consistent with previous monitoring events. The average hydraulic gradient throughout the SCPP BABs during the first semiannual 2020 monitoring event is estimated at 0.003 ft/ft with an estimated average seepage velocity of approximately 0.00011 ft/day or 0.039 ft/year (approximately 0.40 inches/year), using the average hydraulic conductivity of 0.013 ft/day (TRC, 2017) and an assumed effective porosity of 0.4. The average hydraulic gradient throughout the SCPP BABs during the second semiannual 2020 monitoring event is estimated at 0.003 ft/ft with an estimated average seepage velocity of approximately 0.00008 ft/day or 0.031 ft/year (approximately 0.40 inches/year), using the average hydraulic conductivity of 0.013 ft/day and an assumed effective porosity of 0.4.

As presented in the GWMS Report, there is a horizontally expansive clay with substantial vertical thickness that isolates the uppermost aquifer from the SCPP BABs CCR unit. The general flow rate and direction in the uppermost aquifer from both events are similar to that identified in previous monitoring rounds and continues to demonstrate that groundwater flows at a low rate and the compliance wells are appropriately positioned to detect the presence of Appendix III parameters that could potentially migrate from the SCPP BABs CCR unit.

3.0 Statistical Evaluation

3.1 Establishing Background Limits

As discussed in the Stats Plan, intrawell statistical methods for the BABs CCR unit were selected based on the geology and hydrogeology at the Site (primarily the presence of clay/hydraulic barrier, the relatively small footprint of the BABs, and the low vertical and horizontal groundwater flow velocity), 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 of the downgradient wells 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 four established detection monitoring wells (MW-16-01 through MW-16-04). 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 SCPP BABs 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 Semiannual Event (March 2020)

The concentrations of the indicator parameters in each of the detection monitoring wells (MW-16-01 through MW-16-04) were compared to their respective statistical background limits calculated from the background data collected from each individual well (i.e., monitoring data from MW-16-01 is compared to the background limit developed using the background dataset from MW-16-01, and so forth).

The statistical evaluation of the March 2020 Appendix III indicator parameter data shows that there were no concentrations above background limits for any Appendix III indicator parameters during the first 2020 semiannual detection monitoring event. The data comparisons of the March 2020 data to background limits are presented in Table 3.

3.3 Data Comparison to Background Limits – Second Semiannual Event (September 2020)

As done with the March 2020 data, the concentrations of the indicator parameters in each of the detection monitoring wells (MW-16-01 through MW-16-04) were compared to their respective statistical background limits calculated from the background data collected from each individual well.

The statistical evaluation of the September 2020 Appendix III indicator parameters shows that there were no concentrations above background limits for any Appendix III indicator parameter. The comparisons of the September 2020 data to background limits are presented on Table 4.

4.0 Conclusions and Recommendations

No SSIs were recorded for the 2020 monitoring period and detection monitoring will be continued at the SCPP BABs CCR unit in accordance with §257.94. As discussed above, and in the GWMS Report, with the very thick continuous silty clay-rich confining unit beneath the SCPP BABs CCR unit, there is no reasonable probability for the uppermost aquifer to have been affected by CCR from SCPP operations.

No corrective actions were performed in 2020. The next semiannual monitoring event is scheduled for the second calendar quarter of 2021.

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
St. Clair Power Plant Bottom Ash Basins
East China Township, Michigan

CERTIFICATION

I hereby certify that the annual groundwater and corrective action report presented within this document for the SCPP BABs 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	
Company: TRC Engineers Michigan, Inc.	Date: January 29, 2021	

6.0 References

TRC. July 2016; Revised March and August. CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company St. Clair Power Plant Bottom Ash Basins, 4901 Pointe Drive, East China Township, Michigan. Prepared for DTE Electric Company.

TRC. October 2017. Groundwater Monitoring System Summary Report – DTE Electric Company St. Clair Power Plant Bottom Ash Basins Coal Combustion Residual Unit, 4901 Pointe Drive, East China Township, Michigan. Prepared for DTE Electric Company.

TRC. October 2017. Groundwater Statistical Evaluation Plan – DTE Electric Company St. Clair Power Plant Coal Combustion Residual Bottom Ash Basins, 4901 Pointe Drive, East China Township, Michigan. Prepared for DTE Electric Company.

TRC. January 2018. Annual Groundwater Monitoring Report – DTE Electric Company St. Clair Power Plant Coal Combustion Residual Bottom Ash Basins, 4901 Pointe Drive, East China Township, Michigan. Prepared for DTE Electric Company.

TRC. January 2020. 2019 Annual Groundwater Monitoring Report – DTE Electric Company St. Clair Power Plant Coal Combustion Residual Bottom Ash Basins, 4901 Pointe Drive, East 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.

Tables

Table 1
Summary of Groundwater Elevation Data –May and September 2020
St. Clair Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program
East China Township, Michigan

	MP-01		MW-16-01		MW-16-02		MW-16-03		MW-16-04	
Date Installed	3/23/2016		3/31/2016		3/29/2016		3/25/2016		3/23/2016	
TOC Elevation	580.84[(1)]		584.74		581.43		581.39		580.95	
Geologic Unit of Screened Interval	NA		Silty Clay Shale Interface		Silty Clay Shale Interface		Silty Clay/Hardpan Shale Interface		Silty Clay/Hardpan Shale Interface	
Screened Interval Elevation	NA		458.1 to 453.1		456.2 to 451.2		455.1 to 450.1		455.0 to 450.0	
Unit	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft
Measurement Date	Depth to Water	Surface Water Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation
05/05/2020	2.35	578.49	3.21	581.53	1.54	579.89	1.61	579.78	1.09	579.86
9/14/2020	NM	579.21[(2)]	3.25	581.49	1.30	580.13	1.10	580.29	0.85	580.10

Notes:

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

ft BTOC - feet below top of casing

NA - not applicable

1) Elevation represents the point of reference used to collect surface water level measurements.

2) Surface water elevation taken from NOAA/National Oceanic St.Clair River gauging station, St.Clair, MI (ID: 901480).

Table 2
Summary of Field Data – March and September 2020
St. Clair Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program
East 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	3/19/2020	1.29	-128.8	8.5	4,398	11.0	9.95
	9/15/2020	1.27	-196.8	8.1	4,340	12.9	21.0
MW-16-02	3/19/2020	1.05	-165.2	8.3	6,431	10.2	13.0
	9/15/2020	1.14	-198.0	8.1	6,248	16.0	24.4
MW-16-03	3/19/2020	1.11	-156.9	8.4	6,933	11.8	9.95
	9/15/2020	1.25	-176.5	7.9	6,743	14.8	28.1
MW-16-04	3/19/2020	1.09	-159.7	8.4	8,247	9.5	175
	9/15/2020	0.95	-210.5	8.2	8,170	15.8	100.0

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 2020
St. Clair Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program
East China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04	
Sample Date:		3/19/2020	PL	3/19/2020	PL	3/19/2020	PL	3/19/2020	PL
Constituent	Unit	Data		Data		Data		Data	
Appendix III									
Boron	ug/L	2,300	2,600	2,200	2,400	2,200	2,300	2,500	2,600
Calcium	ug/L	20,000	24,000	37,000	69,000	50,000	61,000	41,000	57,000
Chloride	mg/L	1,300	1,400	1,900	2,100	2,100	2,200	2,600	2,800
Fluoride	mg/L	1.9	2.1	1.5	1.6	1.4	1.6	1.6	1.7
pH, Field	SU	8.5	7.2 - 8.6	8.3	7.5 - 8.3	8.4	7.3 - 8.5	8.4	7.3 - 8.4
Sulfate	mg/L	< 5.0	62	< 5.0	25	< 5.0	25	< 5.0	25
Total Dissolved Solids	mg/L	2,200	2,500	3,000	3,600	3,100	4,000	4,200	4,400

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).

Table 4
Comparison of Appendix III Parameter Results to Background Limits – September 2020
St. Clair Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program
East China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04	
Sample Date:		9/15/2020	PL	9/15/2020	PL	9/15/2020	PL	9/15/2020	PL
Constituent	Unit	Data		Data		Data		Data	
Appendix III									
Boron	ug/L	2,100	2,600	2,100	2,400	2,000	2,300	2,500	2,600
Calcium	ug/L	19,000	24,000	38,000	69,000	49,000	61,000	44,000	57,000
Chloride	mg/L	1,300	1,400	2,000	2,100	2,200	2,200	2,700	2,800
Fluoride	mg/L	1.9	2.1	1.6	1.6	1.4	1.6	1.5	1.7
pH, Field	SU	8.1	7.2 - 8.6	8.1	7.5 - 8.3	7.9	7.3 - 8.5	8.2	7.3 - 8.4
Sulfate	mg/L	< 2.0	62	< 2.0	25	< 2.0	25	< 5.0	25
Total Dissolved Solids	mg/L	1,900	2,500	2,800	3,600	2,500	4,000	3,400	4,400

Notes:

ug/L - micrograms per liter.

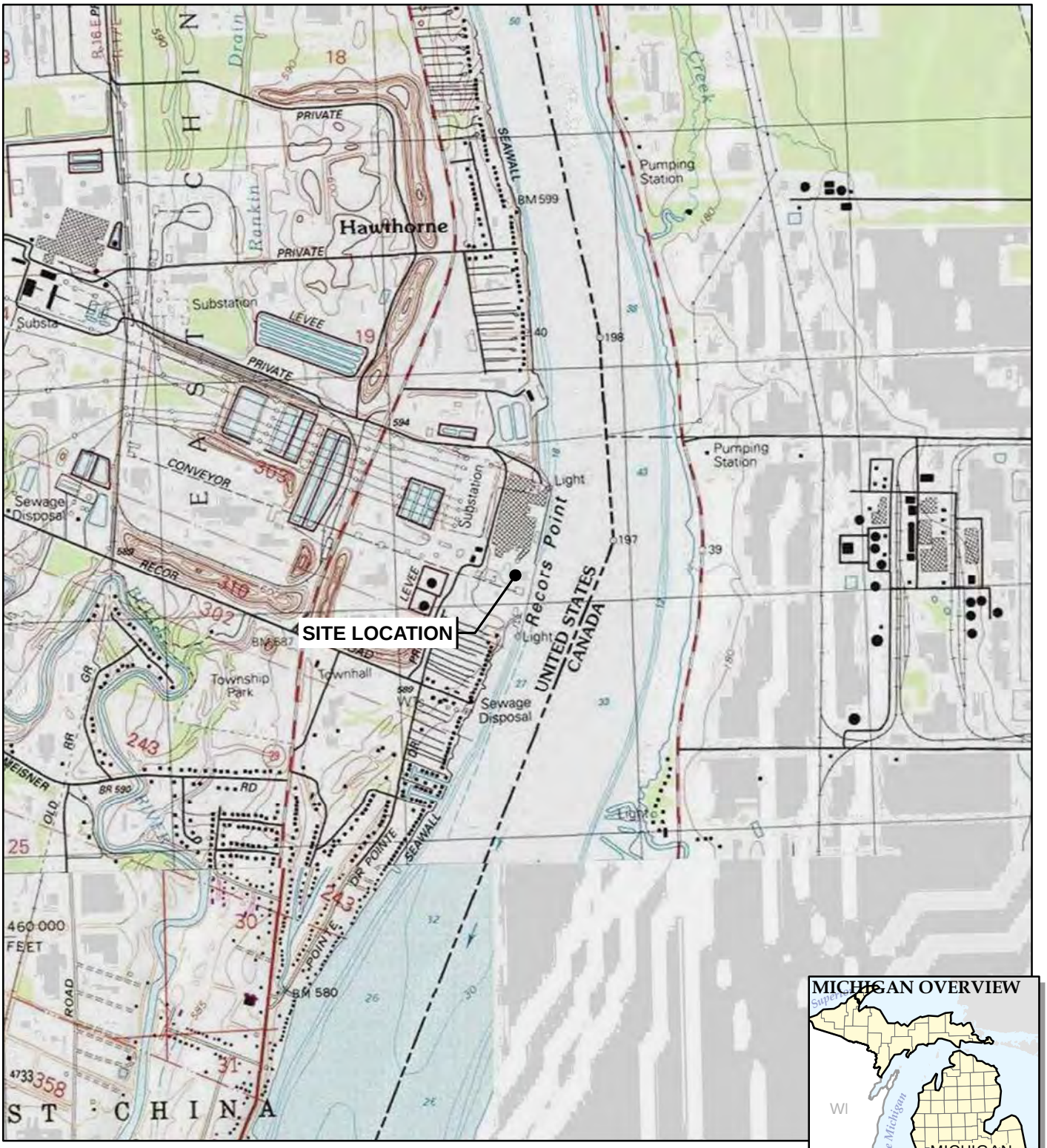
mg/L - milligrams per liter.

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).

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
ST. CLAIR POWER PLANT
4901 POINTE DRIVE
EAST CHINA TOWNSHIP, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	S. MAJOR
CHECKED BY:	J. KRENZ
APPROVED BY:	V. BUENING
DATE:	JANUARY 2021
PROJ. NO.:	320511.0004
FILE:	370029-0004-008slm.mxd

FIGURE 1

E:\DTE\CCR_Sites\2017_265996\370029-0004-008slm.mxd -- Saved By: SMAJOR on 1/28/2021, 15:32:03 PM

LEGEND

- MONITORING WELLS
- SURFACE WATER MEASURING POINT

NOTES

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

0 100 200 Feet

1 " = 100 '

1:1,200

PROJECT:

DTE ELECTRIC COMPANY
ST. CLAIR POWER PLANT BOTTOM ASH BASINS
4901 POINTE DRIVE
CHINA TOWNSHIP, MICHIGAN

TITLE:

SITE PLAN

DRAWN BY:	S. MAJOR	PROJ NO.:	320511.0004
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 2**
DATE:	JANUARY 2021		

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

FILE NO.: 370029-0004-001.mxd

Plot Date: 1/28/2021, 15:42:02 PM by SMAJOR - - LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\370029-0004-001.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

TRC - GIS

LEGEND

- MONITORING WELLS
- SURFACE WATER MEASURING POINT *MEASURES WATER ELEVATION IN ST. CLAIR RIVER
- *(579.85)* GROUNDWATER ELEVATION (FT NAVD88)
- GROUNDWATER ELEVATION CONTOUR (0.5-FT INTERVAL, DASHED WHERE INFERRED)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, MARCH 2019.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN APRIL 2016.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988.

N

0 100 200 Feet

1 " = 100 '

1:1,200

PROJECT:
DTE ELECTRIC COMPANY
ST. CLAIR POWER PLANT
4901 POINTE DRIVE
CHINA TOWNSHIP, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP MAY 2020

DRAWN BY:	S. MAJOR	PROJ NO.:	370029.0004
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	JANUARY 2021		

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Ann Arbor, MI 48108-3284
Phone: 734.971.7080
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FILE NO.: 370029-0004-007.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
Plot Date: 1/5/2021, 10:51:57 AM by SMAJOR -- LAYOUT: ANSI B (11"x17")
Path: E:\DTE\CCR_Sites\2017_265996\370029-0004-007.mxd

LEGEND

- MONITORING WELLS
- SURFACE WATER MEASURING POINT *MEASURES WATER ELEVATION IN ST. CLAIR RIVER
- (579.85) GROUNDWATER ELEVATION (FT NAVD88)
- GROUNDWATER ELEVATION CONTOUR (0.5-FT INTERVAL, DASHED WHERE INFERRED)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, MARCH 2019.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN APRIL 2016.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988.
4. NOAA/NATIONAL OCEANIC SERVICE ST. CLAIR RIVER GAUGING STATION, ST. CLAIR, MI (ID: 901480).

0 100 200 Feet

1 " = 100 '

1:1,200

PROJECT:
DTE ELECTRIC COMPANY
ST. CLAIR POWER PLANT BOTTOM ASH BASINS
4901 POINTE DRIVE
CHINA TOWNSHIP, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2020

DRAWN BY:	S. MAJOR	PROJ NO.:	370029.0004
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	JANUARY 2021		

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1540 Eisenhower Place
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FILE NO.: 370029-0004-001.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
Plot Date: 1/28/2021, 16:06:36 PM by SMAJOR - - LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\DTE_Energy\320511_StClair\370029-0004-001.mxd

Appendix A
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event March 2020
DTE Electric Company St. Clair Power Plant (DTE SCPP)

Groundwater samples were collected by TRC for the March 2020 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 report 240-128051-1.

During the March 2020 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

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. 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). Boron (32 J µg/L), calcium (89,000 µg/L), chloride (56 mg/L), fluoride (0.82 mg/L), sulfate (54 mg/L), and TDS (420 mg/L) were detected in this equipment blank. However, the sample results for boron were detected at concentrations greater than five times the blank concentration and sulfate was not detected in the associated samples; thus, there was no impact on data usability. The positive results for calcium, chloride, fluoride, and TDS in all samples were less than five times the blank concentration and are potentially biased high, as summarized in the attached table.
- 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 boron, calcium, and anions 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 duplicate analyses were not performed for TDS. Per the project QAPP, laboratory duplicate analyses are required for TDS at a frequency of 1 per 20 samples.
- DUP-01 corresponds with MW-16-01; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- The nondetect reporting limits (5.0 mg/L) for sulfate in samples MW-16-01, DUP-01, MW-16-02, MW-16-03, and MW-16-04 were above the QAPP-specified RL (1.0 mg/L) due to 5-fold dilutions likely performed due to elevated concentrations of chloride.

Laboratory Data Quality Review
Groundwater Monitoring Event September 2020
DTE Electric Company St. Clair Power Plant (DTE SCPP)

Groundwater samples were collected by TRC for the September 2020 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 240-136633-1.

During the September 2020 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

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, 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), 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 blank. The laboratory did not provide method blank results for the diluted analysis of chloride in sample DUP-01 and all anions in sample EB-1. The results for anions in the method blank associated with the undiluted anion analysis of the remaining samples were used to evaluate these analyses. No action was taken on this basis.
- LCS recoveries for all target analytes were within laboratory control limits. The laboratory did not provide LCS recoveries for the diluted analysis of chloride in sample DUP-01 and all anions in sample EB-1. The results for anions in the LCS associated with the undiluted anion analysis of remaining samples were used to evaluate these analyses. No action was taken on this basis.
- MS/MSD analyses were performed on sample MW-16-01 for total recoverable boron and sample MW-16-02 for total recoverable calcium. The percent recoveries (%Rs) and relative percent differences (RPDs) for the MS/MSD analyses met the method acceptance criteria.
- Laboratory duplicate analyses were performed for TDS on sample DUP-01. The RPD met the acceptance criteria.
- Dup-01 corresponds with MW-16-01; RPDs between the parent and duplicate sample were within the QC limits.
- The nondetect reporting limit (2.0 mg/L) for sulfate in samples MW-16-01, MW-16-02, and MW-16-03 was above the QAPP-specified RL (1.0 mg/L) due to a 2-fold dilution likely performed due to elevated concentrations of chloride. The nondetect reporting limit (5.0 mg/L) for sulfate in samples MW-16-04 and DUP-01 was above the QAPP-specified RL (1.0 mg/L) due to a 5-fold dilution likely performed due to elevated concentrations of chloride.