



2018 Annual Groundwater Monitoring  
Report

DTE Electric Company  
Belle River Power Plant Bottom Ash Basins  
4505 King Road  
China Township, Michigan

January 2019



# 2018 Annual Groundwater Monitoring Report

**DTE Electric Company  
Belle River Power Plant Bottom Ash Basins**

*4505 King Road  
China Township, Michigan*

January 2019

*Prepared For  
DTE Electric Company*

A handwritten signature in black ink, appearing to read "Graham Crockford".

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Graham Crockford, C.P.G.  
Senior Project Geologist

A handwritten signature in black ink, appearing to read "David B. McKenzie".

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David B. McKenzie, P.E.  
Senior Project Engineer

TRC | DTE Electric Company

Final

X:\WPAAM\PTJ2\265996\03 BRPP\CCR\BABS\2018\R265996-BRPP BABS FINAL.DOCX

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# Executive Summary

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On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended 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) Belle River Power Plant (BRPP) CCR 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 calendar year 2018 activities at the BRPP BABs CCR unit.

In the January 31, 2018 *Annual Groundwater Monitoring Report for the Belle River Power Plant Bottom Ash Basins*, covering calendar year 2017 activities, DTE Electric reported that the pH observed within groundwater at one or more downgradient wells was outside background limits. Resampling was performed in January 2018 in accordance with the TRC October 2017 *Groundwater Statistical Evaluation Plan – Belle River Power Plant Coal Combustion Residual Fly Ash Basin* (Stats Plan). Based on the results of the resampling, the pH was within the prediction limits and no statistically significant exceedance (SSI) or decrease exists for pH in accordance with the Stats Plan. As such, DTE Electric continued detection monitoring at the BRPP BABs CCR unit pursuant to §257.94 of the CCR Rule.

The semiannual detection monitoring events for 2018 were completed in March and October 2018 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 SSIs in detection monitoring parameters to determine if concentrations in detection monitoring well samples exceed background levels. Detection monitoring data that have been collected and evaluated in 2018 are presented in this report.

The groundwater sampling results were below background limits for all Appendix III indicator parameters during both the March and October 2018 semiannual monitoring events; therefore, no SSIs were reported for the BRPP BABs CCR unit. As such, detection monitoring will be continued at the BRPP BABs CCR unit in accordance with §257.94 of the CCR Rule.

# Section 1

## Introduction

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### 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) Belle River Power Plant (BRPP) CCR 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 2018 activities at the BRPP BABs CCR unit (2018 Annual Report).

In the January 31, 2018 *Annual Groundwater Monitoring Report for the Belle River Power Plant Bottom Ash Basins*, covering calendar year 2017 activities (2017 Annual Report), DTE Electric reported that the pH observed within groundwater at one or more downgradient wells was outside background limits. Resampling was performed in January 2018 in accordance with the TRC October 2017 *Groundwater Statistical Evaluation Plan – Belle River Power Plant Coal Combustion Residual Fly Ash Basin* (Stats Plan). Based on the results of the resampling, the pH was within the prediction limits and no statistically significant increase (SSI) or decrease exists for pH in accordance with the Stats Plan. As such, DTE Electric continued detection monitoring at the BRPP BABs CCR unit pursuant to §257.94 of the CCR Rule. The verification sampling and results are summarized in the *Alternate Source Demonstration: 2017 Initial Detection Monitoring Sampling Event Belle River Power Plant Coal Combustion Residual Bottom Ash Basins*, dated April 12, 2018, (April 2018 ASD) included in Appendix A.

This 2018 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 October 2018 semiannual groundwater monitoring events for the BRPP 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 Belle River Power Plant Bottom Ash Basins and Diversion Basin* (QAPP) (TRC, July 2016; revised August 2017) and statistically evaluated per the Stats Plan (TRC, October 2017). As part of the statistical

evaluation, the data collected during detection monitoring events are evaluated to identify SSIs of detection monitoring parameters compared to background levels.

## 1.2 Site Overview

The BRPP is located in Section 13, Township 4 North, Range 16 East, at 4505 King Road, China Township in St. Clair County, Michigan. The BRPP was constructed in the early 1980s with plant operations beginning in 1984. Prior to Detroit Edison Company's operations commencing in the 1980s, the BRPP property was generally wooded and farmland. The property has been used continuously as a coal fired power plant since Detroit Edison Company (now DTE Electric) began power plant operations at BRPP in 1984 and is generally constructed over a natural clay-rich soil base. The BABs have been in use with the BRPP since it began operation and have collected CCR bottom ash that is periodically cleaned out and either sold for beneficial reuse or disposed of at the Range Road Landfill (RRLF).

The BRPP BABs are two adjacent physical sedimentation basins that are slightly raised CCR surface impoundments referred to as the North and South BABs, located north of the BRPP. These are considered one CCR unit. The BABs receive sluiced bottom ash and other process flow water from the power plant. Discharge water from each BAB flows over an outlet weir that gravity flows to a site storm water conveyance network of ditches and pipes, then flows into the diversion basin (DB) CCR unit, which is monitored as a separate CCR unit in accordance with the CCR Rule.

The DB is an incised CCR surface impoundment located west of the BRPP near the Webster Drain. Water flows into the DB from the North and South BABs through a network of pipes and ditches. The DB discharges to the St. Clair River with other site wastewater in accordance with a National Pollution Discharge Elimination System (NPDES) permit.

## 1.3 Geology/Hydrogeology

The BRPP BABs CCR unit is located approximately one-mile west of the St. Clair River. The BRPP BABs CCR unit is underlain by more than 130 feet of unconsolidated sediments, with the lower confining Bedford Shale generally encountered from 135 to 145 feet below ground surface (bgs). In general, the BRPP BABs CCR unit is initially underlain by at least 90 to as much as 136 feet of laterally extensive low hydraulic conductivity silty clay-rich deposits. The depth to the top of the confined sand-rich uppermost aquifer encountered immediately beneath the silty clay-rich deposits varies up to 46 feet within the monitoring well network and rapidly thins to the south and east of the BABs and pinches out (e.g., no longer present) to the southeast in the vicinity of SB-16-01 (Figure 1). Consequently, the uppermost aquifer is not laterally contiguous across the entire BRPP BABs CCR unit, and not present beneath the southeastern corner of the BABs.

The variability in the depth to the uppermost aquifer is a consequence of the heterogeneity of the glacial deposits and is driven by the lateral discontinuity of the sand outwash within the encapsulating fine-grained, silty clay till that confines the uppermost aquifer. There is an apparent lack of interconnection and/or significant vertical variation between the uppermost aquifer sand unit(s) encountered across the BRPP BABs CCR unit as demonstrated by the extensive amount of time (months) it took for water levels in monitoring well MW-16-02 to reach equilibrium after well construction and development (TRC, 2017).

Given the horizontally expansive clay with substantial vertical thickness that isolates the uppermost aquifer from the BRPP BABs CCR unit, the heterogeneity of the glacial deposits (with the top of the uppermost aquifer elevation across the BABs, where present varying up to 46 feet vertically), the no flow boundary where no sand or gravel is present in the southeastern portion of the BABs CCR unit area, and the apparent lack of hydraulic interconnectedness of the uppermost aquifer encountered at the BABs in some areas, it is not appropriate to infer horizontal flow direction or gradients across the BRPP BABs CCR unit.

In addition, the elevation of CCR-affected water maintained within the BRPP BABs is approximately 5 feet above 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 that 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 BRPP it is not possible for the uppermost aquifer to have been affected by CCR from BRPP operations that began in the 1980s.

Due to the relatively small footprint of the BABs, the low vertical and horizontal groundwater flow velocity, the potential for radial flow, and the fact that the saturated unit being monitored is isolated by a laterally contiguous silty-clay unit, which significantly impedes vertical groundwater flow thus preventing the monitored saturated zone from potentially being affected by CCR, monitoring of the BRPP BABs CCR unit using intrawell statistical methods is appropriate. In addition, because the uppermost aquifer is not uniformly present across the BABs CCR unit, there are no clear upgradient wells. As such, intrawell statistical approaches are being used during detection monitoring as discussed in the Stats Plan.



# Section 2

## Groundwater Monitoring

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### 2.1 Monitoring Well Network

A groundwater monitoring system has been established for the BRPP BABs CCR unit as detailed in the *Groundwater Monitoring System Summary Report – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin Coal Combustion Residual Units* (GWMS Report) (TRC, October 2017). The detection monitoring well network for the BABs CCR unit currently consists of five monitoring wells that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

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 variability in the presence of the uppermost aquifer across the site, and presence of no flow boundary on the southeast side of the aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data). An intrawell statistical approach requires that each 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. Monitoring wells MW-16-01 through MW-16-04 and MW-16-09 are located around the north, east and south 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 five background/downgradient 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 2018 was performed during March 26 to 28, 2018 by TRC personnel and samples were analyzed by TestAmerica in accordance with the QAPP. Static water elevation data were collected at all five monitoring well locations. Groundwater samples were collected from the five

detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the March 2018 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 2018 was performed during October 1 to 4, 2018 by TRC personnel and samples were analyzed by TestAmerica in accordance with the QAPP. Static water elevation data were collected at all five monitoring well locations. Groundwater samples were collected from the five detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the October 2018 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 B.

### 2.2.3 Groundwater Flow Rate and Direction

As presented in the GWMS Report, and mentioned above, given the horizontally expansive clay with substantial vertical thickness that isolates the uppermost aquifer from the BRPP BABs CCR unit; the heterogeneity of the glacial deposits (with the top of the uppermost aquifer elevation across the BABs; where present, varying up to 46 feet vertically); the no flow boundary where no sand or gravel is present in the southeastern portion of the BABs CCR unit area; and the apparent lack of hydraulic interconnectedness of the uppermost aquifer encountered at the BABs in some areas, it is not appropriate to infer horizontal flow direction or gradients across the site. Groundwater elevations measured across the Site during the March 2018 sampling event are provided on Table 1 and are summarized in plan view on Figure 3. Groundwater elevations measured across the Site during the October 2018 sampling event are provided on Table 1 and are summarized in plan view on Figure 4.

Groundwater elevation data collected during the 2018 sampling events show that groundwater conditions within the uppermost aquifer are consistent with previous monitoring events and continue to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III parameters that could potentially migrate from the BRPP BABs CCR unit.

# Section 3

## Statistical Evaluation

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### 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 five established detection monitoring wells (MW-16-01 through MW-16-04 and MW-16-09). 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 BRPP 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

The concentrations of the indicator parameters in each of the detection monitoring wells (MW-16-01 through MW-16-04 and MW-16-09) 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 comparisons of the March 2018 and October 2018 data to background limits are presented on Tables 3 and 4, respectively.

The statistical evaluation of both the March 2018 and October 2018 Appendix III indicator parameters shows that all results are below their respective background limits and no SSIs exist for any Appendix III parameter during the March and October 2018 events.

## Section 4

# Conclusions and Recommendations

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The groundwater sampling results were below background limits for all Appendix III indicator parameters during both the March and October 2018 semiannual monitoring events; therefore, there were no SSIs over background limits at the BRPP BABs CCR unit. As such, detection monitoring will be continued at the BRPP BABs CCR unit in accordance with §257.94.

No corrective actions were performed in 2018. The next semiannual monitoring event is scheduled for the second calendar quarter of 2019.

# Section 5

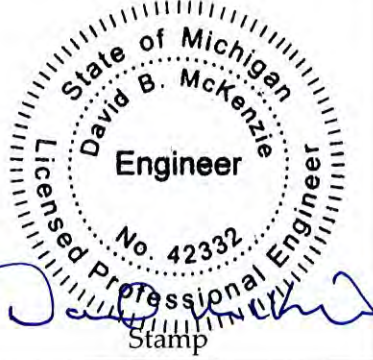
## Groundwater Monitoring Report Certification

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 Belle River Power Plant Bottom Ash Basins China Township, Michigan

#### CERTIFICATION

I hereby certify that the annual groundwater and corrective action report presented within this document for the BRPP 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, 2019	
Company:  TRC Engineers Michigan, Inc.	Date:  <i>January 31, 2019</i>	

# Section 6

## References

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TRC Environmental Corporation. July 2016; Revised March and August 2017. CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Monitoring System Summary Report – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin Coal Combustion Residual Units, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Statistical Evaluation Plan – DTE Electric Company Belle River Power Plant Coal Combustion Residual Bottom Ash Basins, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report – DTE Electric Company Belle River Power Plant Bottom Ash Basins, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. April 12, 2018. Alternate Source Demonstration: 2017 Initial Detection Monitoring Sampling Event Belle River Power Plant Coal Combustion Residual Bottom Ash Basins. 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

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**Table 1**  
 Summary of Groundwater Elevation Data – March & October 2018  
 Belle River Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program  
 China Township, Michigan

Well ID	MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-09	
Date Installed	3/17/2016		3/15/2016		6/1/2016		3/8/2016		6/2/2016	
TOC Elevation	590.06		588.94		590.66		590.51		590.80	
Geologic Unit of Screened Interval	Sand		Sand		Silty Sand		Sand		Sand	
Screened Interval Elevation	496.3 to 491.3		494.3 to 489.3		456.0 to 451.0		468.5 to 463.5		452.3 to 447.3	
Unit	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
3/26/2018	16.21	573.85	14.08	574.86	17.60	573.06	17.00	573.51	16.83	573.97
10/01/2018	16.07	573.99	13.85	575.09	16.05	574.61	16.87	573.64	16.72	574.08

**Notes:**

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

ft BTOC - feet Below top of casing.



**Table 2**  
 Summary of Field Data – March & October 2018  
 Belle River Power Plant Bottom Ash Basins – RCRA CCR Monitoring Program  
 China Township, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (deg C)	Turbidity (NTU)
MW-16-01	3/26/2018	0.21	-147.0	7.6	1,772	11.97	4.08
	10/1/2018	0.29	-131.3	7.7	1,605	11.96	1.93
MW-16-02	3/26/2018	0.23	-128.1	7.6	1,401	12.19	1.64
	10/1/2018	0.36	-131.6	7.8	1,282	12.22	1.68
MW-16-03	3/26/2018	0.13	-153.1	7.8	2,035	12.28	1.50
	10/1/2018	0.12	-156.3	8.0	1,903	12.07	1.84
MW-16-04	3/26/2018	0.27	-186.6	7.8	1,842	11.72	43.2
	10/1/2018	0.60	-161.4	7.9	1,670	13.08	39.1
MW-16-09	3/27/2018	0.37	-230.9	7.8	3,305	10.76	34.6
	10/4/2018	0.17	-126.5	8.4	3,100	12.60	114

**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 2018  
 Belle River Power Plant BABs – RCRA CCR Monitoring Program  
 China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-09	
Constituent	Sample Date:	3/26/2018	PL	3/26/2018	PL	3/26/2018	PL	3/26/2018	PL	3/27/2018	PL
	Unit	Data		Data		Data		Data		Data	
<b>Appendix III</b>											
Boron	ug/L	1,100	1,300	1,200	1,300	1,200	1,300	1,100	1,100	1,600	1,900
Calcium	ug/L	38,000	45,000	54,000	59,000	33,000	36,000	43,000	64,000	39,000	41,000
Chloride	mg/L	480	530	360	400	610	690	490	520	960	1100
Fluoride	mg/L	1.8	1.9	1.2	1.3	1.8	1.9	1.7	1.9	1.5	1.8
pH, Field	SU	7.6	7.6 - 8.1	7.6	7.4 - 8.0	7.8	7.5 - 8.3	7.8	7.5 - 8.4	7.8	7.7 - 8.7
Sulfate	mg/L	2.1	8.1	4.9	20	1.7	14	13	18	38	40
Total Dissolved Solids	mg/L	950	950	730	890	1,000	1,100	920	1,100	1,700	2,000

**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).

**Table 4**  
 Comparison of Appendix III Parameter Results to Background Limits – October 2018  
 Belle River Power Plant BABs – RCRA CCR Monitoring Program  
 China Township, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-09	
Sample Date:		10/1/2018	PL	10/1/2018	PL	10/1/2018	PL	10/1/2018	PL	10/4/2018	PL
Constituent	Unit	Data		Data		Data		Data		Data	
<b>Appendix III</b>											
Boron	ug/L	1,000	1,300	1,200	1,300	1,100	1,300	1,100	1,100	1,600	1,900
Calcium	ug/L	41,000	45,000	53,000	59,000	32,000	36,000	44,000	64,000	41,000	41,000
Chloride	mg/L	500	530	390	400	620	690	520	520	980	1100
Fluoride	mg/L	1.7	1.9	1.2	1.3	1.7	1.9	1.7	1.9	1.5	1.8
pH, Field	SU	7.7	7.6 - 8.1	7.8	7.4 - 8.0	8.0	7.5 - 8.3	7.9	7.5 - 8.4	8.4	7.7 - 8.7
Sulfate	mg/L	6.7	8.1	4	20	1.6	14	13	18	5.5	40
Total Dissolved Solids	mg/L	860	950	730	890	980	1,100	920	1,100	1,500	2,000

**Notes:**

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

-- = not analyzed

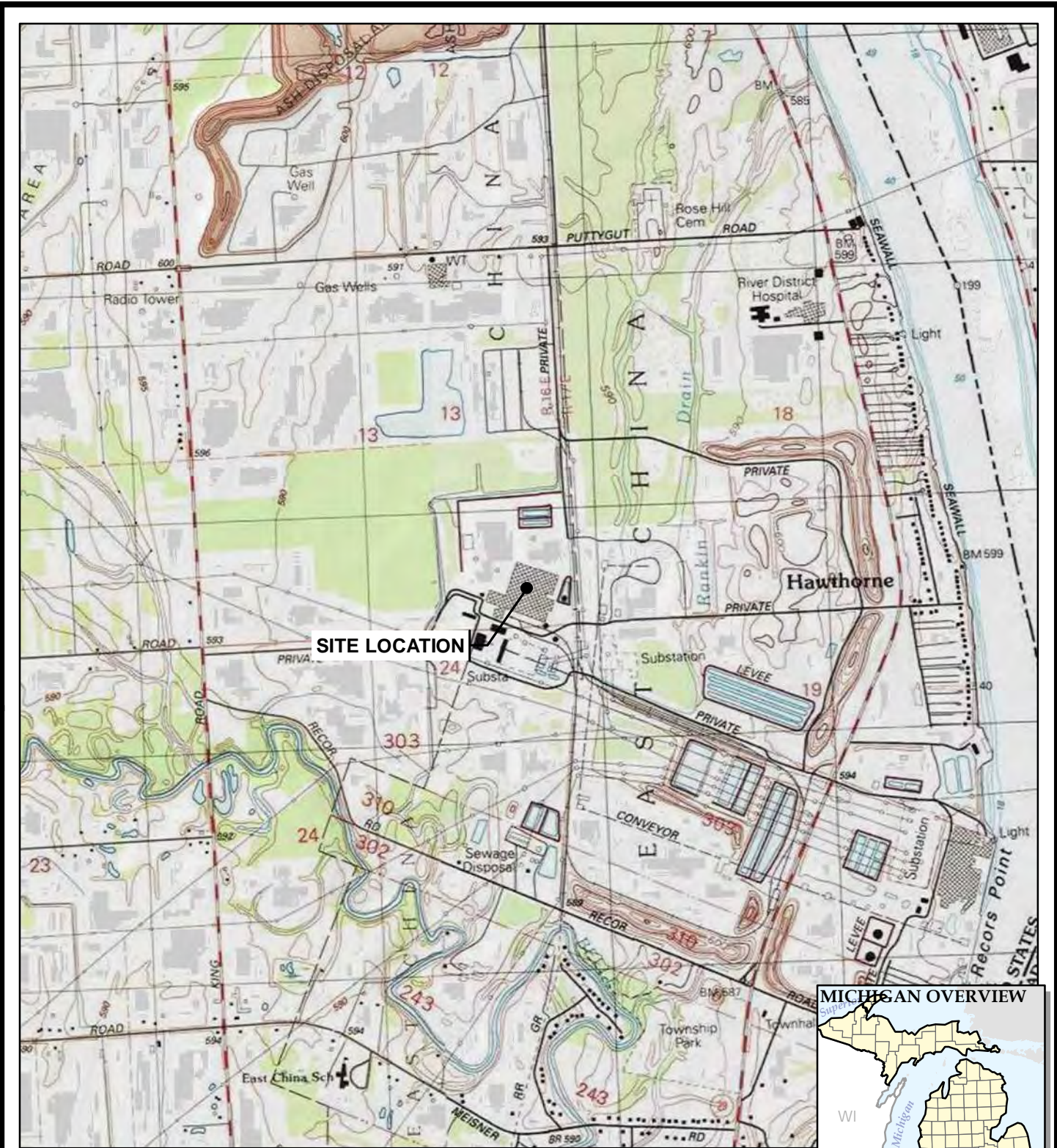
All metals were analyzed as total unless otherwise specified.

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

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

# Figures

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BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



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

PROJECT:

**DTE ELECTRIC COMPANY  
BELLE RIVER POWER PLANT  
4505 KING ROAD  
CHINA TOWNSHIP, MICHIGAN**

TITLE:

**SITE LOCATION MAP**

DRAWN BY:

J. PAPEZ

CHECKED BY:

S HOLMSTROM

APPROVED BY:

V. BUENING

DATE:

OCTOBER 2017

PROJ. NO.:

265996.0003




FILE:

265996-SLMMB.mxd

**FIGURE 1**

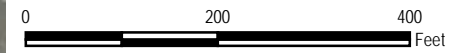


**LEGEND**

-  SOIL BORING
-  MONITORING WELL
-  DECOMMISSIONED MONITORING

**NOTES**

1. BASE MAP IMAGERY FROM ST. CLAIR COUNTY INFORMATION TECHNOLOGY DEPARTMENT WEBMAP, 2015.
2. WELL LOCATIONS SURVEYED IN MARCH, APRIL, JUNE 2016, AND JUNE 2017 BY BMJ ENGINEERS & SURVEYORS, INC.



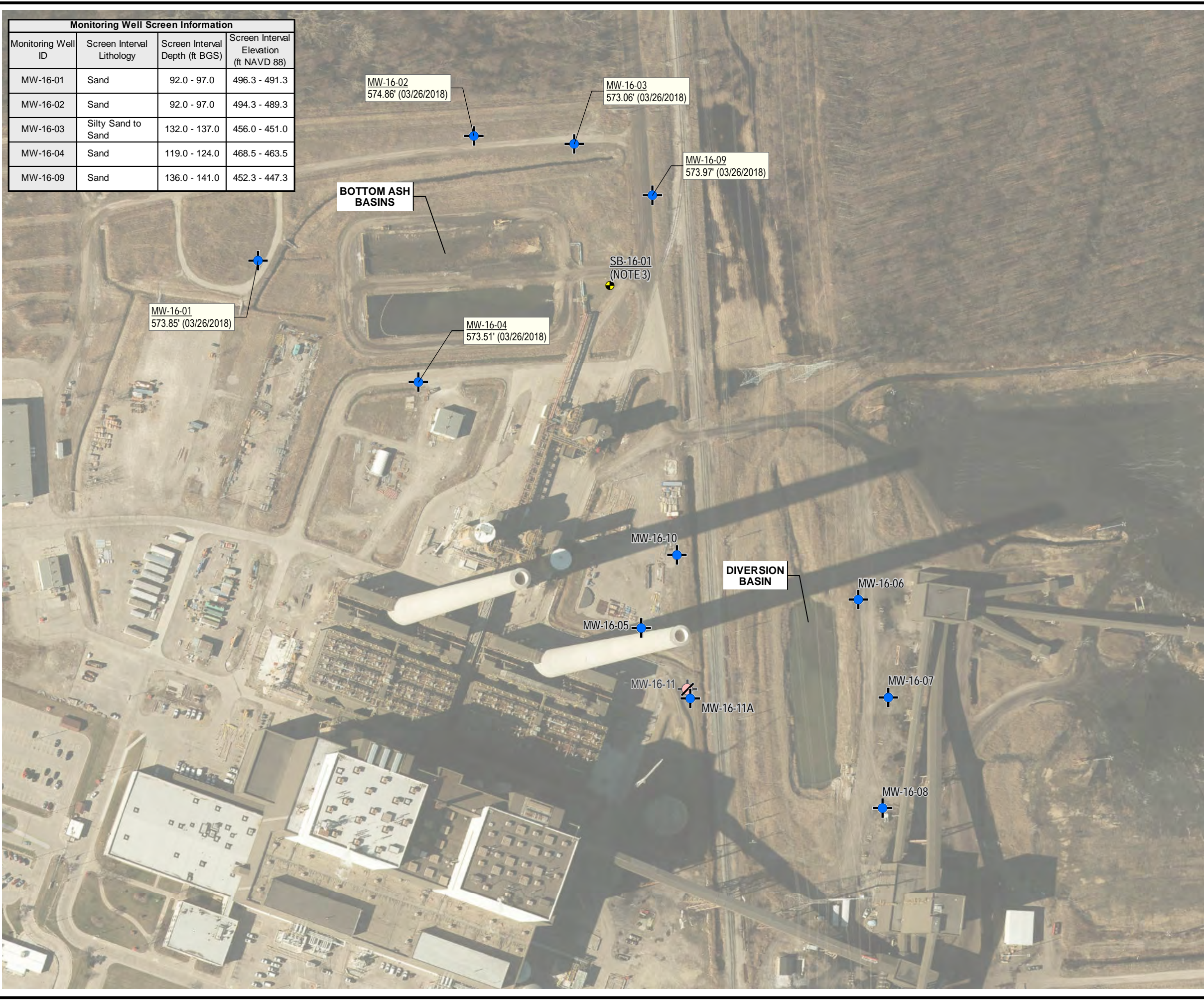
1" = 200'  
1:2,400

PROJECT:		<b>DTE ELECTRIC COMPANY BELLE RIVER POWER PLANT 4505 KING ROAD CHINA TOWNSHIP, MICHIGAN</b>	
TITLE:		<b>SITE PLAN</b>	
DRAWN BY:	S. MAJOR	PROJ NO.:	265996.0003
CHECKED BY:	C. SCIESZKA	<b>FIGURE 2</b>	
APPROVED BY:	V. BUENING		
DATE:	JANUARY 2019		



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

Monitoring Well Screen Information			
Monitoring Well ID	Screen Interval Lithology	Screen Interval Depth (ft BGS)	Screen Interval Elevation (ft NAVD 88)
MW-16-01	Sand	92.0 - 97.0	496.3 - 491.3
MW-16-02	Sand	92.0 - 97.0	494.3 - 489.3
MW-16-03	Silty Sand to Sand	132.0 - 137.0	456.0 - 451.0
MW-16-04	Sand	119.0 - 124.0	468.5 - 463.5
MW-16-09	Sand	136.0 - 141.0	452.3 - 447.3



**LEGEND**

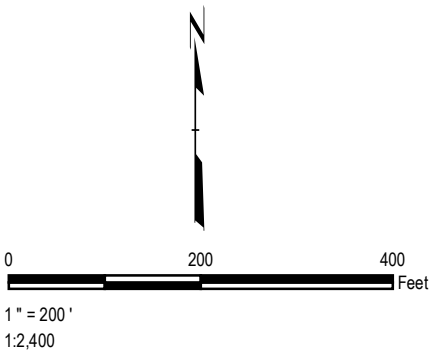
- SOIL BORING
- MONITORING WELL
- DECOMMISSIONED MONITORING WELL

MW ID  
 GROUNDWATER ELEVATION (DATE)  
 GROUNDWATER ELEVATION (DATE)  
 etc...

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

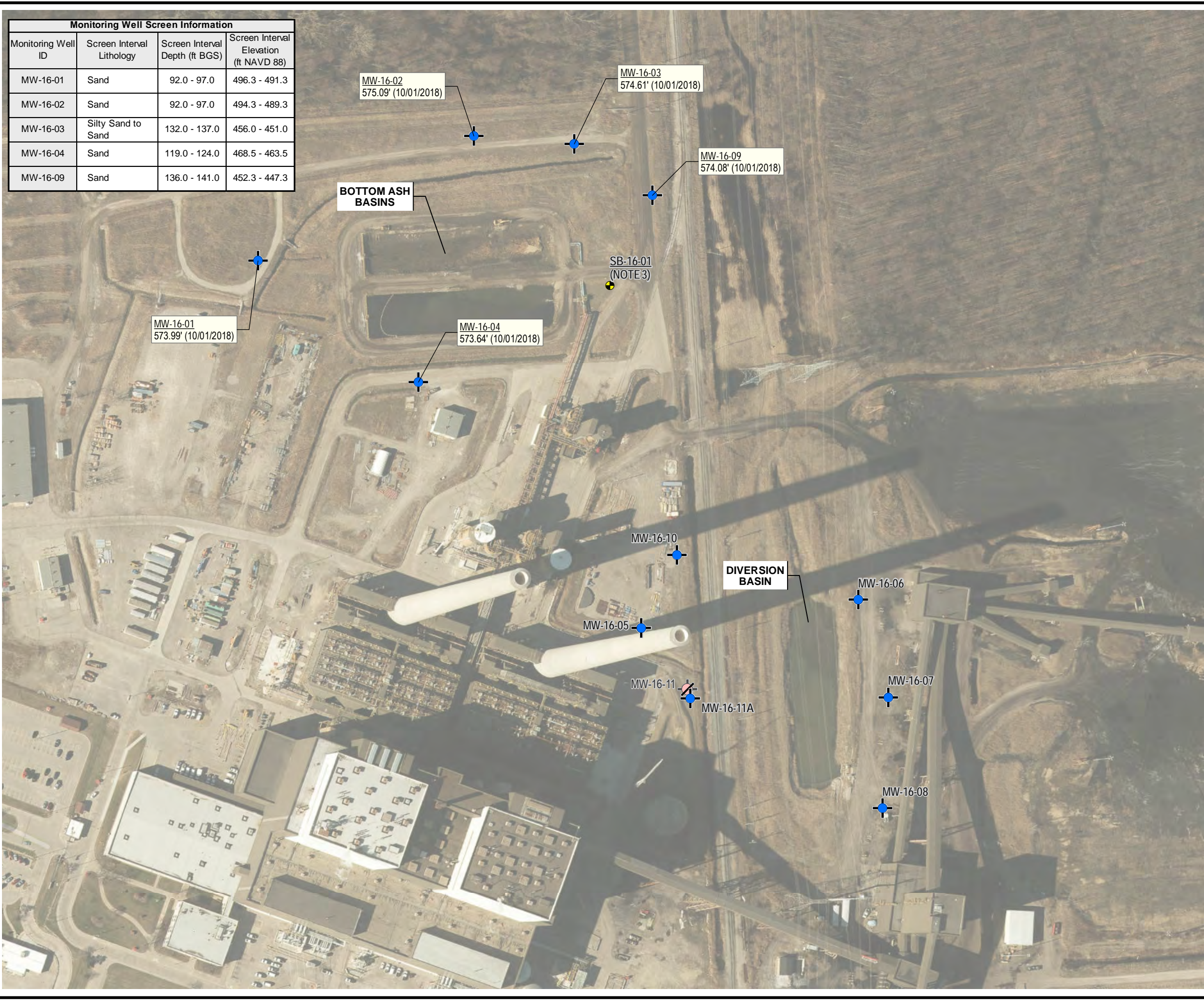
**NOTES**

1. BASE MAP IMAGERY FROM ESRI/MICROSOFT, "WORLD IMAGERY", WEB BASEMAP SERVICE LAYER.
2. WELL LOCATIONS SURVEYED IN MARCH, APRIL AND JUNE 2016 AND JUNE 2017 BY BMJ ENGINEERS & SURVEYORS, INC.
3. NO SAND OR GRAVEL UNIT PRESENT ABOVE BEDROCK IN THIS LOCATION.



PROJECT:	<b>DTE ELECTRIC COMPANY BELLE RIVER POWER PLANT 4505 KING ROAD CHINA TOWNSHIP, MICHIGAN</b>	
TITLE:	<b>BOTTOM ASH BASINS GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY MARCH 2018</b>	
DRAWN BY:	S. MAJOR	PROJ NO.: 265996.0003
CHECKED BY:	C. SCIESZKA	<b>FIGURE 3</b>
APPROVED BY:	V. BUENING	
DATE:	JANUARY 2019	

Monitoring Well Screen Information			
Monitoring Well ID	Screen Interval Lithology	Screen Interval Depth (ft BGS)	Screen Interval Elevation (ft NAVD 88)
MW-16-01	Sand	92.0 - 97.0	496.3 - 491.3
MW-16-02	Sand	92.0 - 97.0	494.3 - 489.3
MW-16-03	Silty Sand to Sand	132.0 - 137.0	456.0 - 451.0
MW-16-04	Sand	119.0 - 124.0	468.5 - 463.5
MW-16-09	Sand	136.0 - 141.0	452.3 - 447.3



**LEGEND**

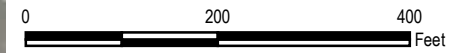
- SOIL BORING
- MONITORING WELL
- DECOMMISSIONED MONITORING WELL

MW ID  
GROUNDWATER ELEVATION (DATE)  
GROUNDWATER ELEVATION (DATE)  
etc...

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

**NOTES**

1. BASE MAP IMAGERY FROM ESRI/MICROSOFT, "WORLD IMAGERY", WEB BASEMAP SERVICE LAYER.
2. WELL LOCATIONS SURVEYED IN MARCH, APRIL AND JUNE 2016 AND JUNE 2017 BY BMJ ENGINEERS & SURVEYORS, INC.
3. NO SAND OR GRAVEL UNIT PRESENT ABOVE BEDROCK IN THIS LOCATION.



1" = 200'  
1:2,400

PROJECT:	<b>DTE ELECTRIC COMPANY BELLE RIVER POWER PLANT 4505 KING ROAD CHINA TOWNSHIP, MICHIGAN</b>	
TITLE:	<b>BOTTOM ASH BASINS GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY OCTOBER 2018</b>	
DRAWN BY:	S. MAJOR	PROJ NO.: 265996.0003
CHECKED BY:	C. SCIESZKA	
APPROVED BY:	V. BUENING	
DATE:	JANUARY 2019	

**FIGURE 4**



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# Appendix A

## Alternative Source Demonstration

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## Technical Memorandum

**Date:** April 12, 2018

**To:** Robert J. Lee  
DTE Electric Company

**From:** Graham Crockford, TRC  
David McKenzie, TRC

**Project No.:** 265996.0003.0000 Phase 003, Task 001

**Subject:** Alternate Source Demonstration: 2017 Initial Detection Monitoring Sampling Event  
Belle River Power Plant Coal Combustion Residual Bottom Ash Basins

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### 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) Belle River Power Plant (BRPP) CCR Bottom Ash Basins (BABs) CCR unit.

TRC Engineers Michigan, Inc. (TRC) prepared the 2017 Annual Groundwater Monitoring Report (Annual Report) for the BRPP BABs CCR unit on behalf of DTE Electric in accordance with the requirements of §257.90(e) (TRC, 2018). The Annual Report included the results of the October 2017 semiannual groundwater monitoring event for the BRPP BABs CCR unit and the statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule) for the BRPP BABs CCR unit. This event is the initial 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 October 2017 Appendix III indicator parameters showed potential SSIs over background for:

- pH at MW-16-01 and MW-16-02

All other Appendix III constituents were within the statistical background limits.

## Technical Memorandum

In accordance with §257.94(3)(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 October 2017 detection monitoring event.

### Background

The BRPP is located in China Township in St. Clair County, Michigan. The BRPP was constructed in the early 1980s with plant operations beginning in 1984. The property has been used continuously as a coal fired power plant since Detroit Edison Company (now DTE Electric) began power plant operations at BRPP in 1984 and is generally constructed over a natural clay rich soil base. The BABs have been in use with the BRPP since it began operation and have collected CCR bottom ash that is periodically cleaned out and either sold for beneficial reuse or disposed of at the Range Road Landfill (RRLF).

The BRPP BABs are two adjacent physical sedimentation basins that are slightly raised CCR surface impoundments referred to as the North and South BABs, located north of the BRPP. These are considered one CCR unit. The BABs receive sluiced bottom ash and other process flow water from the power plant. Discharge water from each BAB gravity flows over an outlet weir to a conveyance network of ditches and pipes, then flows into the diversion basin (DB) CCR unit, which is monitored as a separate CCR unit in accordance with the CCR Rule.

The BRPP BABs CCR unit is located approximately one-mile west of the St. Clair River. The BRPP BABs CCR unit is underlain by more than 130 feet of unconsolidated sediments, with the lower confining Bedford Shale generally encountered from 135 to 145 feet below ground surface (bgs). In general, the BRPP BABs CCR unit is initially underlain by at least 90 to as much as 136 feet of laterally extensive low hydraulic conductivity silty clay-rich deposits. The depth to the top of the confined sand-rich uppermost aquifer encountered immediately beneath the silty clay-rich deposits varies up to 46 feet within the monitoring well network and rapidly thins to the south and east of the BABs and pinches out (e.g., no longer present) to the southeast. Consequently, the uppermost aquifer is not laterally contiguous across the entire BRPP BABs CCR unit, and not present in the southeastern corner of the BABs.

The detection monitoring well network for the BABs CCR unit currently consists of five monitoring wells that are screened in the uppermost aquifer. 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 variability in the presence of the uppermost aquifer across the site, and presence of no flow boundary on the southeast side of the aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data). Monitoring wells MW-16-01 through MW-16-04 and MW-16-09 are located around the north, east and south 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 five background/downgradient monitoring wells).

## Technical Memorandum

### Alternate Source Demonstration

Verification resampling was performed as recommended 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. 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 January 9, 2018, by TRC personnel. Groundwater samples were collected for pH (field reading) at monitoring wells MW-16-01 and MW-16-02 in accordance with the Quality Assurance Project Plan (TRC, July 2016, revised in March and August 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.

All of the pH verification results are within the prediction limits; consequently, the initial SSIs from the October 2017 event are not confirmed. Therefore, in accordance with the Stats Plan and the Unified Guidance, the initial exceedances are not statistically significant and no SSIs will be recorded for the October 2017 monitoring event.

### Conclusions and Recommendations

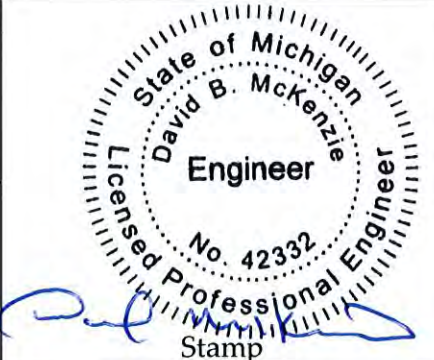
Based on the results of the verification resampling, the initial exceedances for pH at monitoring wells MW-16-01 and MW-16-02 are not statistically significant; therefore, no SSIs are recorded for the initial detection monitoring event. In addition, as discussed in the Annual Report, with the presence of the vertically and horizontally extensive clay-rich confining till beneath the BRPP BABs CCR unit, it is not possible 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.

Since no confirmed SSIs over background limits were identified for any of the Appendix III parameters during the October 2017 monitoring event, DTE Electric will continue with the detection monitoring program at BRPP BABs CCR unit. The next semiannual monitoring event is scheduled for the second calendar quarter of 2018.

## Technical Memorandum

### Certification Statement

I hereby certify that the alternative source demonstration presented within this document for the BRPP BAB 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	
Company: TRC Engineers Michigan, Inc.	Date: April 12, 2018	

### References

TRC Environmental Corporation. July 2016; Revised March and August 2017. CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Monitoring System Summary Report – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin Coal Combustion Residual Units, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Statistical Evaluation Plan – DTE Electric Company Belle River Power Plant Coal Combustion Residual Bottom Ash Basins, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin, 4505 King Road, China Township, Michigan. Prepared for DTE Electric Company.

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

### Attachments

Table 1. Comparison of Verification Sampling Results to Background Limits

Attachment A. Data Quality Review

# Technical Memorandum

## Table 1

**Table 1**  
 Comparison of Verification Sampling Results to Background Limits  
 Belle River Power Plant BABs – RCRA CCR Monitoring Program  
 China Township, Michigan

Sample Location:		<b>MW-16-01</b>		<b>MW-16-02</b>	
Sample Date:		1/9/2018		1/9/2018	
Constituent	Unit	Data	PL	Data	PL
<b>Appendix III</b>					
pH, Field	SU	7.6	7.6 - 8.1	7.4	7.4 - 8.0

**Notes:**

SU - standard units; pH is a field parameter.

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

# Technical Memorandum

## Attachment A Data Quality Review



# **Field Parameter Data Quality Review**

## **Groundwater Monitoring Event January 2018 (Verification Resampling)**

### **DTE Electric Company Belle River Power Plant (DTE BRPP)**

On January 9, 2018, TRC Environmental Corporation (TRC) collected groundwater samples at MW-16-01 and MW-16-02 to verify initial pH (field measured) results that were outside of the prediction limits during the October 2017 detection monitoring event. Prior to sample collection, groundwater was purged and stabilized using the low flow sampling methods followed during the October 2017 monitoring event in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Belle River Power Plant Bottom Ash Basins and Diversion Basin (QAPP)* (TRC, July 2016; revised August 2017).

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

### **Data Quality Review Procedure**

The following items were included in the evaluation of the data:

- Review of sonde calibration data;
- Confirm field parameter stabilization criteria were met;
- Compare field parameters to historical data; and
- Overall usability of the data based on these items.

### **Review Summary**

The data quality objectives and 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:**

- Sonde calibration readings were within calibration range for all field parameters.
- Field parameters met stabilization criteria for 3 successive readings.
- Field parameters readings were comparable to historical data.
- Data are usable for purposes of verification resampling.

# Appendix B

## Data Quality Reviews

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# Laboratory Data Quality Review

## Groundwater Monitoring Event March 2018 (Detection Monitoring)

### DTE Electric Company Belle River Power Plant (DTE BRPP)

Groundwater samples were collected by TRC for the April 2018 sampling event for the Bottom Ash Basins and Diversion Basin at the DTE BRPP. Samples were analyzed for anions, total metals, and total dissolved solids by Test America Laboratories, Inc. (Test America), located in Canton, Ohio. The laboratory analytical results are reported in laboratory report J93478-1.

During the April 2018 sampling event, a groundwater sample was collected from each of the following wells:

#### Bottom Ash Basins:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-09

#### Diversion Basin:

- MW-16-05
- MW-16-06
- MW-16-07
- MW-16-08
- MW-16-10
- MW-16-11A

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	EPA 9056A
Total Metals	EPA 6010B
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;
- 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;

- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD). Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- 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.

- 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 were within laboratory control limits.
- Dup-01 corresponds with MW-16-06; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicates were performed on sample Dup-01 for total dissolved solids; RPDs between the parent and duplicate sample were within the QC limits.
- MS/MSD analyses were performed on sample MW-16-04, MW-16-07, and EB\_20180327 for anions (fluoride and sulfate). Percent recoveries and RPDs were within laboratory control limits.

**Laboratory Data Quality Review**  
**Groundwater Monitoring Event October 2018 (Detection Monitoring)**  
**DTE Electric Company Belle River Power Plant (DTE BRPP)**

Groundwater samples were collected by TRC for the October 2018 sampling event for the Bottom Ash Basins and Diversion Basin at the DTE BRPP. Samples were analyzed for anions, total metals, and total dissolved solids by Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory reports 240-102395-1 and 240-102609-1-1.

During the October 2018 sampling event, a groundwater sample was collected from each of the following wells:

Bottom Ash Basins:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-09

Diversion Basin:

- MW-16-05
- MW-16-06
- MW-16-07
- MW-16-08
- MW-16-10
- MW-16-11A

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.

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:**

- There was one equipment blank submitted with this dataset (EB-01\_20181003). Chloride at 1.2 mg/L and TDS at 11 mg/L were detected in this equipment blank. However, the sample results for these analytes were detected at concentrations greater than five times the blank concentrations; thus, there was no impact on data usability.
- 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-16-02 for the anions; the percent recoveries (%Rs) and relative percent differences (RPDs) were acceptable.

- Dup-01 corresponds with MW-16-03; RPDs between the parent and duplicate sample were within the QC limits.
- The reporting limit (2.0 mg/L) for the nondetect sulfate results in samples MW-16-08 and MW-16-11A was above the QAPP-specified RL (1.0 mg/L) due to a 2-fold dilution as a result of a difficult matrix.