2019 GROUNDWATER MONITORING & CORRECTIVE ACTION REPORT

COAL ASH PONDS
ELMER SMITH STATION
DAVIESS COUNTY
OWENSBORO, KENTUCKY

Prepared For:
OWENSBORO MUNICIPAL UTILITIES
OWENSBORO, KENTUCKY

Prepared By:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
PITTSBURGH, PENNSYLVANIA

CEC Project 164-014

JANUARY 31, 2020

Civil & Environmental Consultants, Inc.

Pittsburgh

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1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) issued 40 C.F.R. § 257, Subpart D, *Disposal of Coal Combustion Residuals from Electric Utilities* (CCR Rule) on April 17, 2015. The CCR Rule regulates disposal of coal combustion residuals (CCR) in new and active landfills and impoundments. Civil & Environmental Consultants, Inc. (CEC) has been engaged by Owensboro Municipal Utilities (OMU) to prepare the 2019 Groundwater Monitoring and Corrective Action Report for the Coal Ash Ponds (aka the Site) at the Elmer Smith Station (ESS) as required by the CCR Rule. This document summarizes the monitoring activity conducted during 2019, including sampling events, statistical analyses, and Assessment of Corrective Measures (ACM). It is intended that this document will be placed in the facility Operating Record as required by 40 C.F.R. §257.105(h)(1), and posted on the publicly accessible website as required by 40 C.F.R. §257.107(h)(1).

2.0 SITE OVERVIEW

2.1 BACKGROUND

The Ash Pond area associated with the Site is less than 10 acres in size and consists of three separate unlined ash settling basins (Ponds 1, 2, and 3). A Site location map and a Site and vicinity aerial map showing the location of the Ash Ponds are provided as Figures 1 and 2, respectively. The basins are not used for the disposal of CCR but for the temporary storage of CCR material prior to being excavated and transported off-site for disposal or beneficial re-use. Pond 1 is used for Unit 1 boiler slag; Pond 2 receives other ash and water plant blowdown (lime softening sludge), and, Pond 3 receives no ash directly and is used for final settling prior to discharge. Other plant discharges, including coal pile runoff, Flue Gas Desulfurization (FGD) blowdown, roof and floor drains, etc. are also conveyed through the ponds. Based on a review of aerial images, topographic contour data from the USGS National Map, Owensboro East Quadrangle, and a Site map prepared by others labeled "Structural Fill Finish Grading" dated August 28, 1962[1], the Ash Ponds appear to be incised in the native soils to a depth of approximately 8 feet below ground surface (bgs). This was confirmed through knowledge of Site personnel.

CEC assisted OMU with the design and installation of a permanent Groundwater Monitoring System (GMS) to comply with the GMS performance standard contained within the Federal CCR Rule (Section 257.91), as documented in the GMS Certification Report dated October 17, 2017 (CEC, 2017 (1)) and Amended GMS Certification Report dated March 2019 (CEC 2019(1)). Prior to the installation of the GMS, groundwater monitoring had not been conducted at the Site.

2.2 HYDROGEOLOGIC SETTING

Subsurface conditions encountered at the Site, as evidenced by the soil borings advanced in association with a Preliminary Hydrogeologic Investigation and the permanent GMS wells, are consistent with Quaternary-aged alluvium, and buried outwash (Tazewell age) typically found within the Ohio River Valley[2]. Variable thicknesses of fine-grained silt and clay lenses are

[1] Drawing No. S-7 "Structural Finish Grading", prepared by Black & Veatch, dated August 28, 1962.

interbedded with deposits of coarser-grained, poorly-graded sand beneath a thin veneer of topsoil, crushed stone fill, or other fill material. The near-surface fine-grained deposits are thicker near the Ohio River, and decrease in thickness away from the river towards the southeast, where sand becomes the predominant soil type. A low permeability clay layer was encountered at depths ranging from 26 to 43 feet bgs, varying in thickness from approximately 1 foot to over 16 feet, with an increasing trend in layer thickness towards the south/southeast. The clay layer is underlain by saturated, coarse-grained deposits that comprise the uppermost aquifer at the Site. Aquifer saturated thickness in the vicinity of the Site ranges from approximately 60 to 100 feet[2]. Based on the depth to groundwater and the depth of the Ash Ponds, it does not appear that groundwater is in direct communication with the Ash Ponds. Refer to the GMS Certification Report (CEC, 2017(1) for a geologic cross-section and boring logs for the Site.

2.2.1 Hydrogeologic Characteristics

Groundwater occurs within the coarse-grained deposits that constitute the uppermost aquifer at the Site. Depth to water measurements collected from the GMS monitoring well network during the 2019 sampling events ranged from 62.83 feet below top of casing (BTOC) at MW-7 to 42.30 feet BTOC at MW-1. Static groundwater elevations on-site during 2019 ranged from 356.82 feet above mean sea level (AMSL) at MW-8 to 362.88 feet AMSL at MW-3. The normal pool elevation of the adjacent Ohio River in the vicinity of ESS is approximately 358 feet AMSL[3]. Potentiometric data are summarized on Table 1 and shown on Figure 3.

Groundwater elevation measurements indicate that the groundwater flow direction is to the south/southeast at an approximate average hydraulic gradient of 0.001. This flow direction is contrary to what is typically observed in this type of hydrogeologic setting, where groundwater flow is towards the surface water body. The flow direction is interpreted to be a result of the pumping influence from the 11 nearby water production wells (Figure 2) associated with municipal

[2] *Geohydrology and Simulation of Ground-Water Flow for the Ohio River Alluvial Aquifer near Owensboro, Northwestern Kentucky.* U.S. Geological Survey Water-Resources Investigation Report 96-4274. 1997. Figure 7.

[3]Ohio River Navigation Charts from Cairo, Illinois to Foster, Kentucky (June 2010). U.S. Army Corps of Engineers, Louisville District. Chart No. 53.

water production operations at OMU's Cavin Water Treatment Plant, which has a capacity of up to 10 million gallons per day. Between the Cavin Plant and Water Plant A, which is located west of the Cavin Plant and draws from the same well field, OMU's total withdrawal capacity is 28 million gallons per day. Absent operation of the production wells, groundwater flow direction is likely to the northwest towards the Ohio River; however, some combination of pumping wells is always in operation and the observed groundwater levels measured since the installation of the GMS (Table 1) indicate a south/southeasterly groundwater flow direction.

Hydraulic conductivity of the uppermost aquifer was not evaluated as part of the GMS installation process; however, based on published scientific reports, the Site is located in an area where horizontal hydraulic conductivity values are estimated to range from 126 to 157 feet per day[4].

[4]*Geohydrology and Simulation of Ground-Water Flow for the Ohio River Alluvial Aquifer near Owensboro, Northwestern Kentucky.* U.S. Geological Survey Water-Resources Investigation Report 96-4274. 1997. Figure 11.

3.0 GROUNDWATER MONITORING SYSTEM

The GMS consists of eight monitoring wells. Monitoring wells MW-1 and MW-3 are used to monitor groundwater elevation, and monitoring wells MW-2, MW-4, MW-5, MW-6, MW-7, and MW-8 are utilized to monitor both groundwater elevation and groundwater quality. Refer to the GMS Certification Report (CEC, 2017(1) for lithologic descriptions and well construction diagrams. As noted above in Section 2.2.1, the groundwater pumping at the municipally-operated well field and proximity of the Ash Ponds to the Ohio River create a unique hydrogeologic setting where there is not an ideal location to establish background groundwater quality conditions (i.e., groundwater that does not have the potential to be affected by leakage from a CCR unit). Two monitoring wells (MW-2 and MW-7) were used to establish and monitor background groundwater conditions.

While MW-2 is currently hydraulically upgradient, this is an artificial condition created by the operation of the production wells. Prior to the operation of the production wells (ca. 1998) this well would have been situated in a downgradient location. Also, should the production wells cease to operate in the future, groundwater flow direction would likely be reversed toward the river and MW-2 would be in a downgradient location. Because of this unique and artificial condition, the MW-7 location was also selected to accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit. MW-7, while located hydraulically downgradient from the Ash Ponds, is placed in a location so as not to be on a direct flow path from the ponds. MW-7 is also at a sufficient distance from the ponds to be representative of background conditions for the well field aquifer.

Downgradient monitoring wells MW-4, MW-5, and MW-6 are used to monitor water quality of groundwater passing the boundary of the CCR unit. These wells were placed as close as possible to the CCR unit boundary to provide for detection of groundwater contamination in the uppermost aquifer. Additionally, in the event that the well field should cease pumping operations for an extended period of time and the groundwater flow direction reverts back toward the river, monitoring wells MW-1 and MW-3 (currently used only for water level monitoring) can serve as future downgradient wells along with MW-2.

Monitoring well MW-8 was installed in December 2018 after one constituent (molybdenum) was quantified at a statistically significant level (SSL) in downgradient monitoring wells MW-5 and MW-6 (see Section 6.0) in an effort to characterize the nature and extent of the release, as required by §257.95(g)(1).

A summary of the GMS wells is provided in the table below.

CCR RULE GROUNDWATER MONITORING SYSTEM				
Location	**Relative Location**	**Well Diameter (in.)**	**Total Depth (ft-bgs)**	**Screen Length (ft)**
MW 1	Upgradient	4	57	10
MW-2	Upgradient (Background)	4	57	10
MW-3	Upgradient	4	57	10
MW-4	Downgradient	4	59	10
MW-5	Downgradient	4	59	10
MW-6	Downgradient	4	59	10
MW-7	Downgradient (Background)	4	72	10
MW-8	Downgradient	4	63	15

4.0 CCR RULE SAMPLING PROGRAM PROGRESSION

4.1 BASELINE DATA AND BACKGROUND VALUES

The baseline sampling at ESS was performed between February 2017 and September 2017. The Appendix III background concentration values were determined using an upper prediction limit (UPL) method in accordance with the statistical methodology described in the *Detection Monitoring Statistical Methods Certification* for the Site, dated October 17, 2017 (CEC, 2017(2)). Background UPL values were calculated for each parameter based on the initial eight baseline sampling events conducted at the two background wells to establish background UPL values. The final background UPL values are summarized in the table below:

CCR RULE APPENDIX III BACKGROUND VALUES		
Parameter	**Units**	**UPL Value**
Boron, Total	mg/L	0.33
Calcium, Total	mg/L	139.5
Chloride	mg/L	50
Fluoride	mg/L	NC
pH, laboratory	s.u.	8.01
Sulfate	mg/L	154.3
Total Dissolved Solids	mg/L	950.8

NC = not calculated because constituent was not quantified at concentrations exceeding laboratory detection limit.

4.2 SSI DETERMINATION

Statistically Significant Increases (SSIs) for Appendix III parameters were determined within the Detection Monitoring program based upon comparison of the results from the October 2017 Detection Monitoring event to the UPL of the mean concentration detected in the background wells from the eight rounds of baseline monitoring. Based upon the results, one or more SSIs were identified at MW-4, MW-5, and MW-6.

Each downgradient location had at least one identified SSI. SSIs for boron, calcium, sulfate, and total dissolved solids (TDS) were the most common among the downgradient wells. Below is a tabular summary of the SSIs observed:

SUMMARY OF OBSERVED SSIs AT OMU ESS							
	Appendix III Parameters						
Monitoring Point	**Boron**	**Calcium**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**Total Dissolved Solids (TDS)**
MW-4	X	X				X	X
MW-5	X					X	
MW-6	X	X				X	X

X – SSI Determined

4.3 TRANSITION TO ASSESSMENT MONITORING

As a result of the SSI determinations, the Assessment Monitoring Program was initiated in April 2018 for ESS consisting of sampling and analysis for Appendix IV constituents. A notification of the transition into the Assessment Monitoring Program was placed in the facility's Operating Record in accordance with §257.105(h) on January 19, 2018 (CEC, 2018).

4.4 GROUNDWATER PROTECTION STANDARDS

The CCR Rule requires that two Assessment Monitoring events be performed and analytical results obtained before establishing Groundwater Protection Standards (GWPSs) for Appendix IV constituents in accordance with Section §257.95(h) of the CCR Rule. The GWPSs are then compared to the downgradient Appendix IV concentrations to identify if downgradient concentrations exceed the GWPS at Statistically Significant Levels (SSLs) that would prompt an Assessment of Corrective Measures.

A GWPS may be determined as follows:

- For constituents for which a maximum contaminant level (MCL) has been established under U.S. EPA 40 C.F.R. §141.62 and §141.66 of this title, the GWPS is equal to the MCL;
- For cobalt, lead, lithium, and molybdenum where a MCL has not been established, the GWPS is set equal to the concentrations outlined in §257.95(h)(2); and,

- For constituents for which the background groundwater concentration exceeds the MCL identified under option 1, or the standards identified under option 2, the GWPS is equal to the UPL of the background concentration in accordance with §257.95(h)(3).

In accordance with option 3 above, the background concentration for each parameter was determined from the UPL for each parameter using the initial eight baseline sampling events from the two background wells. This value was then compared to the MCL or the established health-based value to determine the final GWPS.

GWPS values were established for the Site, consistent with §257.95(d)(2). The table below summarizes background concentrations, MCL values, and health-based values for detected constituents at the Site.

GWPS DETERMINATION FOR OMU ESS					
Appendix IV Constituent	**Units**	**UPL**	**MCL**	**Health-based Value**	**Final GWPS**
Total Metals					
Antimony, Total	mg/L	ND/NC	0.006	--	0.006
Arsenic, Total	mg/L	ND/NC	0.010	--	0.010
Barium, Total	mg/L	0.18	2	--	2
Beryllium, Total	mg/L	0.00091	0.004	--	0.004
Cadmium, Total	mg/L	ND/NC	0.005	--	0.005
Chromium, Total	mg/L	4.1	0.1	--	4.1
Cobalt, Total	mg/L	0.098	--	0.006	0.098
Lead, Total	mg/L	0.015	0.015	0.015	0.015
Lithium, Total	mg/L	ND/NC	--	0.040	0.040
Mercury, Total	mg/L	ND/NC	0.002	--	0.002
Molybdenum, Total	mg/L	ND/NC	--	0.100	0.100
Selenium, Total	mg/L	ND/NC	0.05	--	0.05
Thallium, Total	mg/L	ND/NC	0.002	--	0.002
Non-Metals					
Fluoride	mg/L	1.0	4	--	4
Combined Radium-226/228	pCi/L	9.32	5	--	9.32

Notes:

- ND/NC = constituent was not detected at concentrations exceeding laboratory reporting limits in the background monitoring wells, and therefore UPL was not calculated.
- -- = No Value Established

4.5 STATISTICALLY SIGNIFICANT LEVEL DETERMINATION

The final SSL determination was based on whether or not an exceedance of GWPSs occurred for an Appendix IV constituent at a downgradient GMS location in both the initial (April 2018) and resample (June 2018) sampling events. Based on the analytical results, one constituent (molybdenum) was detected at a SSL at two locations (MW-5 and MW-6). A summary of the constituents quantified at a SSL are summarized below:

	Appendix IV Parameters														
Downgradient GMS Location	**Antimony, Total**	**Arsenic, Total**	**Barium, Total**	**Beryllium, Total**	**Cadmium, Total**	**Chromium, Total**	**Cobalt, Total**	**Lead, Total**	**Lithium, Total**	**Mercury, Total**	**Molybdenum, Total**	**Selenium, Total**	**Thallium, Total**	**Fluoride**	**Combined Radium 226/228**
MW-4															
MW-5											X				
MW-6											X				

X – SSL Determined

In accordance with §257.105(h), a notification was placed into the facility's Operating Record on October 31, 2018 indicating that an SSL had been observed for molybdenum. The Site will remain in Assessment Monitoring unless concentrations of constituents in Appendix IV are quantified at levels equal to or less than the GWPS.

The December 2018 SSL evaluation confirmed the SSL determinations from the April and June 2018 AM events. As a result of the confirmation of the SSL for molybdenum, the facility was required to perform an Assessment of Corrective Measures in addition to continuing with the Assessment Monitoring program.

The source of the observed SSLs in the downgradient GMS wells was determined to be attributable to the Ash Ponds. A Release Characterization was initiated in December 2018, consisting of the installation of one monitoring well (MW-8) in the southwest corner of the ESS property to delineate the extent of the molybdenum impact in groundwater downgradient from the Ash Ponds (Figure 1). MW-8 was sampled in December of 2018, and May and November of 2019. Molybdenum was not detected in MW-8 at concentrations that exceeded the laboratory reporting limits in any of the sampling events.

5.0 2019 GROUNDWATER SAMPLING SUMMARY

In accordance with §257.95(b), an annual Assessment Monitoring event was performed on May 23, 2019. Groundwater samples were collected from the six GMS sampling locations and submitted to ALS for analysis of Appendix III and Appendix IV parameters. The semi-annual Assessment Monitoring event was performed on November 7, 2019, in accordance with §257.95(d)(1), which included sampling of the six GMS locations and laboratory analysis for Appendix III parameters and the Appendix IV parameters that were quantified at concentrations exceeding their respective laboratory reporting limits during the May sampling event. An analytical summary for the Assessment Monitoring sampling events is provided in Table 2.

A summary of the 2019 sampling events is provided below. The Site remained in the Assessment Monitoring Program throughout 2019.

2019 CCR RULE GROUNDWATER SAMPLING EVENTS		
Location	**May 2019 Event**	**November 2019 Event**
Downgradient Wells		
MW-4	5/23/2019	11/7/2019
MW-5	5/23/2019	11/7/2019
MW-6	5/23/2019	11/7/2019
MW-8	5/23/2019	11/7/2019
Background Wells		
MW-2	5/23/2019	11/7/2019
MW-7	5/23/2019	11/7/2019

6.0 STATISTICALLY SIGNIFICANT LEVEL DETERMINATION

6.1 DECEMBER 2018 ANALYTICAL RESULTS

The 2018 Groundwater Monitoring and Corrective Action Report was issued prior to the SSL evaluation based upon the results from the December 2018 sampling event. The conclusions of that evaluation are discussed here. As described in Section 4.4, the CCR rule requires two rounds of Assessment Monitoring (AM) sampling occur prior to the determination of the GWPS. Following the evaluation for SSLs from the April and June 2018 AM events, per §257.95(d)(1)], resampling is required within 90 days of determination of a SSL of an Appendix IV constituent. In accordance with §257.105(h), a notification was placed into the facility's Operating Record on October 31, 2018 indicating that an SSL had been observed for molybdenum. Resampling was performed on December 11, 2018 within 90 days of the SSL determination from the June 2018 event.

Based on the analytical results from the December 2018 resampling event, one constituent (molybdenum) was quantified at a SSL at two locations (MW-5 and MW-6), consistent with the findings of the SSL evaluation from the April and June 2018 events.

6.2 MARCH 2019 ANALYTICAL RESULTS

Based on the analytical results from the March 2019 sampling event, one constituent (molybdenum) was quantified at a SSL at two locations (MW-5 and MW-6), consistent with historical results.

6.3 NOVEMBER 2019 ANALYTICAL RESULTS

Statistical analysis of the laboratory data obtained from the November 2019 will be performed within 90 days of receiving the laboratory results to evaluate whether or not constituents are present at SSLs, consistent with §257.95(g).

7.0 ASSESSMENT OF CORRECTIVE MEASURES

CEC performed an ACM for the Site pursuant to 40 CFR §257.96 due to the presence of molybdenum in the downgradient GMS monitoring wells at SSLs exceeding the GWPS. Various corrective measures options, including: monitored natural attenuation, waste excavation and disposal, in-situ remediation, capping, operation of a pump and treat groundwater remediation system, and installation of a groundwater cut-off wall were evaluated with respect to the requirements of §257.97(b)(1) through (5) and §257.97 (c)(1) through (4) and two primary corrective measures objectives:

1. Reduce leaching of CCR chemicals of concern (COCs) from the coal ash impoundments via infiltration of surface water and inundation of groundwater, which appears to be the primary source of the observed groundwater impacts; and,
2. Monitor performance of the selected corrective measure through continued sampling of the GMS wells to demonstrate compliance with the GWPS.

The final remedy will be selected following the public meeting and comment period in accordance with §257.96(e). However, after consideration of the available options, the current preferred corrective measures approach is excavation and off-site disposition of the CCR within the Ash Ponds. Monitored natural attenuation will also be conducted to evaluate the performance of the applied corrective measure. OMU has outlined the preliminary approach for implementing this remedy in their Initial and Post Closure Plan for the facility, dated October 17, 2016 (revised October 19, 2017). This option provides protection of human health and the environment and a high level of confidence that further releases of COCs from the Ash Ponds will not occur. The monitored natural attenuation will serve to monitor the performance of the excavation remedy, while the pump and treat option will serve in a backup capacity in the event that the excavation does not perform as expected.

7.1 EXTENSION

40 CFR §257.96(a) allows for a 60-day extension of the deadline to complete the ACM. This extension was utilized, and the ACM report was placed in the facility's Operating Record on

May 29, 2019, as required by 40 C.F.R. §257.105(h)(10). Notice of the availability to the ACM report was submitted to the Kentucky Department for Environmental Protection (KDEP) by OMU via email in accordance with 40 C.F.R. §257.106(h)(8), and the ACM report was posted on the publicly accessible website as required by 40 C.F.R. §257.107(h)(8). A copy of the ACM 60-day Notification, which is certified by a professional engineer, is provided in Appendix I.

8.0 PLANNED ACTIVITIES FOR 2020

This section discusses the groundwater monitoring and reporting activities anticipated for ESS in 2020. All dates are tentative and subject to change based on findings.

January 2020:

- Enter the *2019 Annual Groundwater Monitoring and Corrective Action Report* into the facility's Operating Record.

February 2020:

- Hold public meeting to discuss the results of the ACM and the remedy that is anticipated to be selected.
- Evaluate analytical data from the November 2019 Assessment Monitoring sampling event against GWPS.

March 2020:

- Place documentation of the public meeting in the Operating Record.
- Post the *2019 Annual Groundwater Monitoring and Corrective Action Report* to the public internet site and notify KDEP.

May 2020:

- The first semi-annual groundwater monitoring event in 2020 will be conducted. Assessment Monitoring samples (i.e., Appendix III and IV) will be collected during the event.

June 2020:

- Post to the public internet site and notify KDEP of the final Remedy Selection report.

August 2020:

- Appendix IV sample results collected in May 2020 will be evaluated for a SSL over background.

November 2020:

- The second semi-annual groundwater monitoring event in 2020 will be conducted. Assessment Monitoring samples (i.e., Appendix III and IV) will be collected during the event. Note SSLs for the November 2020 Assessment Monitoring event will be determined by January 2021.

December 2020:

- Preparation of the *2020 Annual Groundwater Monitoring and Corrective Action Report* will begin.

9.0 RECORDKEEPING REQUIREMENTS

In accordance with §257.105(h) this document has been placed in OMU's Operating Record. A copy will also be placed on the publicly accessible website, and a notification will be submitted to the KDEP to comply with §257.107(h) and §257.106(h) of the CCR Rule.

10.0 REFERENCES

CEC, 2017(1). CCR Rule Groundwater Monitoring Certification Coal Ash Ponds, Elmer Smith Station, Owensboro, Kentucky, Prepared For: Owensboro Municipal Utilities, Owensboro, Kentucky, Prepared by Civil & Environmental Consultants, Inc., Pittsburgh, Pennsylvania, CEC Project 164-014, October 2017.

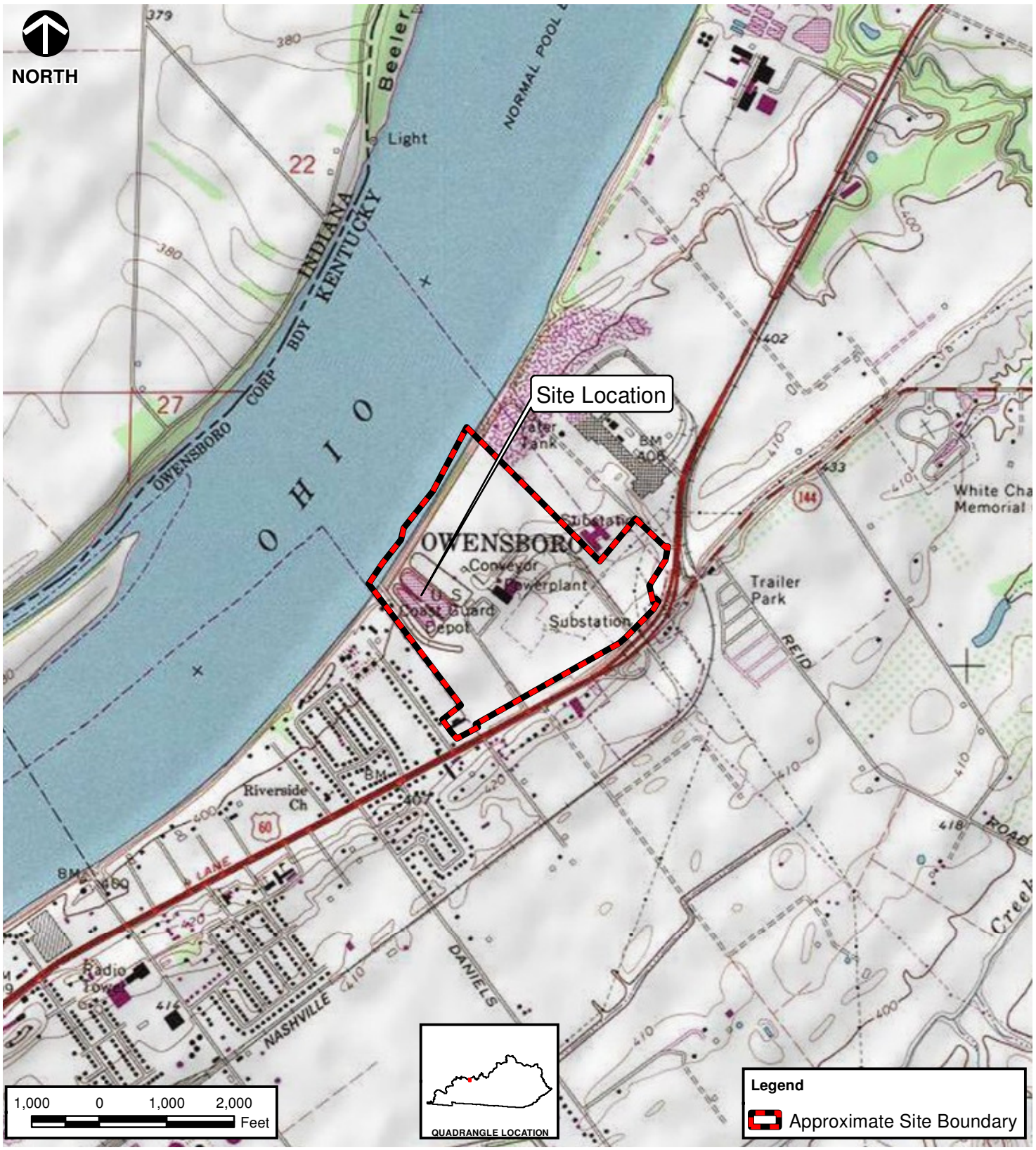
CEC, 2017(2). Detection Monitoring Statistical Methods Certification, Coal Ash Ponds, Elmer Smith Station, Owensboro, Kentucky, Prepared For: Owensboro Municipal Utilities, Owensboro, Kentucky, Prepared by Civil & Environmental Consultants, Inc., Pittsburgh, Pennsylvania, CEC Project 164-014, October 2017.

CEC, 2019(1). 2018 Groundwater Monitoring and Corrective Action Report, Coal Ash Ponds, Elmer Smith Station, Owensboro, Kentucky, Prepared For: Owensboro Municipal Utilities, Owensboro, Kentucky, Prepared by Civil & Environmental Consultants, Inc., Pittsburgh, Pennsylvania, CEC Project 164-014, January 2019.

CEC, 2019(2). Amended Detection Monitoring Statistical Methods Certification, Coal Ash Ponds, Elmer Smith Station, Owensboro, Kentucky, Prepared For: Owensboro Municipal Utilities, Owensboro, Kentucky, Prepared by Civil & Environmental Consultants, Inc., Pittsburgh, Pennsylvania, CEC Project 164-014, March 2019.

CEC, 2019(3). Assessment of Corrective Measures, Coal Ash Ponds, Elmer Smith Station, Owensboro, Kentucky, Prepared For: Owensboro Municipal Utilities, Owensboro, Kentucky, Prepared by Civil & Environmental Consultants, Inc., Pittsburgh, Pennsylvania, CEC Project 164-106, May 2019.

FIGURES



SOURCE: PORTION OF THE USGS 7.5-MINUTE SERIES TOPOGRAPHIC QUADRANGLE MAP - OWENSBORO EAST, KY - 1983

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OWENSBORO, DAVIESS COUNTY, KY

SITE LOCATION MAP

DRAWN BY:	MGN	CHECKED BY:	HTW	APPROVED BY:	HTW*	FIGURE NO:	1
DATE:	JANUARY 18, 2019	DWG SCALE:	1 " = 2,000 '	PROJECT NO:	164-014.0018		

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NORTH

Ohio River

MW-3
MW-2
MW-1
Pond 1
Pond 2
Pond 3
MW-4
MW-6
MW-5
MW-7
MW-8
49
48
50
61
63
66
65
64
68
69
67

Cooling Water Discharge Canal (channelized)

Cavin Water Treatment Plant

Coast Guard Lane

Ellis Smeathers Road

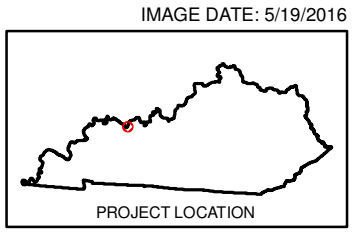
State Route 2380

E 4th Street (State Route 144)

SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 1/31/2019
IMAGE DATE: 5/19/2016

Legend

- Approximate Site Boundary
- GMS Monitoring Well
- OMU Municipal Production Well



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SITE AND VICINITY AERIAL MAP
WITH GMS WELLS

DRAWN BY:	MGN	CHECKED BY:	MGN	APPROVED BY:	HTW*	FIGURE NO:	2
DATE:	JAN 31, 2019	SCALE:	1 " = 400 '	PROJECT NO:	164-014		

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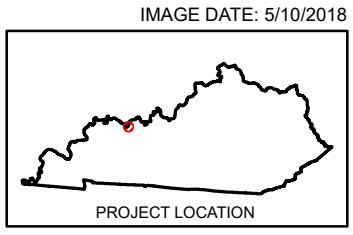
SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 1/17/2020
IMAGE DATE: 5/10/2018

Legend

- Approximate Site Boundary
- Equipotential Line
- OMU Municipal Production Well
- MW-1 GMS Monitoring Well
- 579.45 Groundwater Elevation (feet above mean sea level)



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POTENTIOMETRIC SURFACE MAP
NOVEMBER 7, 2019

DRAWN BY: MGN	CHECKED BY: MGN	APPROVED BY: HTW*	FIGURE NO: 3
DATE: JAN 17, 2020	SCALE: 1 " = 400 '	PROJECT NO: 164-014	

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TABLES

TABLE 1
Groundwater Elevation Summary
OMU Elmer Smith Station Ash Ponds
Owensboro, KY
(all measurements are in feet)

Well ID (AKGWA #)	Location Relative to Ash Ponds	Ground Surface Elevation (AMSL)	TOC Elevation (AMSL)	Measurement Date	Depth to Water Measurement (ft BTOC)	Groundwater Elevation (AMSL)
MW-1 (8006-9522)	Upgradient	402.00	404.53	12/8/2016	48.51	356.02
				12/13/2016	48.07	356.46
				2/8/2017	45.69	358.84
				3/8/2017	40.68	363.85
				4/6/2017	43.51	361.02
				5/3/2017	45.91	358.62
				5/15/2017	43.46	361.07
				6/16/2017	49.94	354.59
				6/29/2017	46.72	357.81
				7/13/2017	49.81	354.72
				7/27/2017	49.99	354.54
				8/9/2017	49.15	355.38
				8/23/2017	50.38	354.15
				9/6/2017	50.31	354.22
				9/20/2017	50.04	354.49
				10/10/2017	49.55	354.98
				4/5/2018	34.75	369.78
				6/5/2018	46.61	357.92
				12/12/2018	43.97	360.56
				12/27/2018	35.66	368.87
				5/23/2019	42.30	362.23
				11/7/2019	45.43	359.10
MW-2 (8006-9523)	Upgradient (Background)	402.75	405.55	12/8/2016	49.21	356.34
				12/13/2016	48.74	356.81
				2/8/2017	46.29	359.26
				3/8/2017	41.24	364.31
				4/6/2017	44.16	361.39
				5/3/2017	45.48	360.07
				5/15/2017	44.02	361.53
				6/16/2017	50.02	355.53
				6/29/2017	47.17	358.38
				7/13/2017	50.16	355.39
				7/27/2017	50.23	355.32
				8/9/2017	50.75	354.80
				8/23/2017	50.97	354.58
				9/6/2017	50.95	354.60
				9/20/2017	50.69	354.86
				10/10/2017	50.20	355.35
				4/5/2018	35.70	369.85
				6/5/2018	47.22	358.33
				12/12/2018	44.51	361.04
				12/27/2018	36.85	368.70
				5/23/2019	42.94	362.61
				11/7/2019	46.13	359.42

Notes: AMSL = Above Mean Sea Level
TOC = Top of Casing
Ft BTOC = Feet Below Top of Casing

TABLE 1
Groundwater Elevation Summary
OMU Elmer Smith Station Ash Ponds
Owensboro, KY
(all measurements are in feet)

Well ID (AKGWA #)	Location Relative to Ash Ponds	Ground Surface Elevation (AMSL)	TOC Elevation (AMSL)	Measurement Date	Depth to Water Measurement (ft BTOC)	Groundwater Elevation (AMSL)
MW-3 (8006-9524)	Upgradient	403.78	406.39	12/8/2016	49.88	356.51
				12/13/2016	49.43	356.96
				2/8/2017	46.95	359.44
				3/8/2017	41.64	364.75
				4/6/2017	44.56	361.83
				5/3/2017	45.90	360.49
				5/15/2017	44.51	361.88
				6/16/2017	50.06	356.33
				6/29/2017	47.29	359.10
				7/13/2017	50.64	355.75
				7/27/2017	50.69	355.70
				8/9/2017	51.35	355.04
				8/23/2017	51.65	354.74
				9/6/2017	51.43	354.96
				9/20/2017	51.25	355.14
				10/10/2017	50.82	355.57
				4/5/2018	36.10	370.29
				6/5/2018	47.84	358.55
				12/12/2018	45.16	361.23
				12/27/2018	37.61	368.78
				5/23/2019	43.51	362.88
				11/7/2019	46.59	359.80
MW-4 (8006-9525)	Downgradient	406.44	408.02	12/8/2016	54.44	353.58
				12/13/2016	54.06	353.96
				2/8/2017	51.22	356.80
				3/8/2017	52.97	355.05
				4/6/2017	54.99	353.03
				5/3/2017	55.75	352.27
				5/15/2017	53.95	354.07
				6/16/2017	58.65	349.37
				6/29/2017	57.60	350.42
				7/13/2017	58.20	349.82
				7/27/2017	58.73	349.29
				8/9/2017	58.97	349.05
				8/23/2017	59.48	348.54
				9/6/2017	58.73	349.29
				9/20/2017	57.75	350.27
				10/10/2017	57.15	350.87
				4/5/2018	48.85	359.17
				6/5/2018	51.97	356.05
				12/12/2018	50.92	357.10
				12/27/2018	48.87	359.15
				5/23/2019	45.72	362.30
				11/7/2019	49.83	358.19

Notes: AMSL = Above Mean Sea Level
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TABLE 1
Groundwater Elevation Summary
OMU Elmer Smith Station Ash Ponds
Owensboro, KY
(all measurements are in feet)

Well ID (AKGWA #)	Location Relative to Ash Ponds	Ground Surface Elevation (AMSL)	TOC Elevation (AMSL)	Measurement Date	Depth to Water Measurement (ft BTOC)	Groundwater Elevation (AMSL)
MW-5 (8005-9530)	Downgradient	403.56	406.16	6/16/2017	56.37	349.79
				6/29/2017	56.66	349.50
				7/13/2017	56.62	349.54
				7/27/2017	57.03	349.13
				8/9/2017	57.05	349.11
				8/23/2017	57.45	348.71
				9/6/2017	57.11	349.05
				9/20/2017	56.12	350.04
				10/10/2017	55.51	350.65
				4/5/2018	45.14	361.02
				6/5/2018	50.11	356.05
				12/12/2018	49.16	357.00
				12/27/2018	46.58	359.58
				5/23/2019	44.07	362.09
				11/7/2019	47.47	358.69
MW-6 (8006-9531)	Downgradient	405.23	407.35	6/16/2017	57.96	349.39
				6/29/2017	57.40	349.95
				7/13/2017	57.96	349.39
				7/27/2017	58.16	349.19
				8/9/2017	58.55	348.80
				8/23/2017	58.82	348.53
				9/6/2017	58.65	348.70
				9/20/2017	57.41	349.94
				10/10/2017	56.84	350.51
				4/5/2018	46.53	360.82
				6/5/2018	51.56	355.79
				12/12/2018	50.53	356.82
				12/27/2018	48.35	359.00
				5/23/2019	45.30	362.05
				11/7/2019	48.77	358.58
MW-7 (8006-9532)	Downgradient (Background)	418.26	421.11	6/16/2017	72.90	348.21
				6/29/2017	73.25	347.86
				7/13/2017	72.87	348.24
				7/27/2017	73.81	347.30
				8/9/2017	74.31	346.80
				8/23/2017	74.31	346.80
				9/6/2017	73.71	347.40
				9/20/2017	73.79	347.32
				10/10/2017	73.70	347.41
				4/5/2018	67.61	353.50
				6/5/2018	69.37	351.74
				12/12/2018	66.12	354.99
				12/27/2018	65.11	356.00
				5/23/2019	61.60	359.51
				11/7/2019	62.83	358.28
MW-8 (8007-1801)	Downgradient	402.97	405.82	12/27/2018	49.51	356.31
				5/23/2019	46.10	359.72
				11/7/2019	49.00	356.82

Notes: AMSL = Above Mean Sea Level
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TABLE 2

Groundwater Analytical Summary - CCR Rule Assessment Monitoring (2019)

OMU Elmer Smith Station

Owensboro, KY

		Background/Upgradient					Downgradient					Downgradient					
Sample ID		**MW-2**					**MW-4**					**MW-5**					**Groundwater**
Collection Date		4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	**Protection Standard**
Total Metals	**Units**																
Antimony	mg/L	<0.0060	NA	NA	<0.0060	NA	<0.0060	NA	NA	<0.0060	NA	<0.0060	NA	NA	<0.0060	NA	0.006
Arsenic	mg/L	<0.010	NA	NA	<0.010	NA	<0.010	NA	NA	<0.010	NA	<0.010	NA	NA	<0.010	NA	0.010
Barium	mg/L	<0.10	<0.10	<0.10	<0.10	**0.062**	<0.10	<0.10	<0.10	<0.10	**0.05**	**0.11**	**0.12**	<0.10	<0.10	**0.07**	2
Beryllium	mg/L	<0.00040	NA	NA	<0.00040	NA	<0.00040	NA	NA	<0.00040	NA	<0.00040	NA	NA	<0.00040	NA	0.004
Boron	mg/L	NA	<0.10	**0.11**	<0.10	**17**	NA	**11**	**5.6**	**9.8**	**13**	NA	**12**	**10**	**12**	**13**	0.33
Cadmium	mg/L	<0.0050	NA	NA	<0.0050	NA	<0.0050	NA	NA	<0.0050	NA	<0.0050	NA	NA	<0.0050	NA	0.005
Calcium	mg/L	NA	**53**	**100**	**70**	**250**	NA	**180**	**100**	**200**	**200**	NA	**150**	**120**	**130**	**130**	139.5
Chromium	mg/L	<0.020	<0.020	<0.020	<0.020	<0.0050	<0.020	<0.020	<0.020	<0.020	<0.0050	<0.020	<0.020	<0.020	<0.020	<0.0050	4.10
Cobalt	mg/L	<0.0040	NA	NA	<0.0040	<0.0050	<0.0040	NA	NA	<0.0040	<0.0050	<0.0040	NA	NA	<0.0040	<0.0050	0.098
Lead	mg/L	<0.015	NA	NA	<0.015	NA	<0.015	NA	NA	<0.015	NA	<0.015	NA	NA	<0.015	NA	0.015
Lithium	mg/L	<0.10	NA	NA	<0.010	<0.0050	<0.10	NA	NA	<0.010	<0.0050	<0.10	NA	NA	**0.019**	**0.02**	0.040
Mercury	mg/L	<0.00020	NA	NA	<0.00020	NA	<0.00020	NA	NA	<0.00020	NA	<0.00020	NA	NA	<0.00020	NA	0.002
Molybdenum	mg/L	<0.10	<0.10	<0.10	<0.10	**0.011**	<0.10	<0.10	<0.10	<0.10	**0.0085**	**0.34**	**0.41**	**0.36**	**0.5**	**0.85**	0.10
Selenium	mg/L	<0.030	NA	NA	<0.030	**0.017**	<0.030	NA	NA	<0.030	<0.0050	<0.030	NA	NA	<0.030	**0.019**	0.050
Thallium	mg/L	<0.0050	NA	NA	<0.0020	NA	<0.0050	NA	NA	<0.0020	NA	<0.0050	NA	NA	<0.0020	NA	0.002
Anions																	
Chloride	mg/L	NA	**18**	**18**	**16**	**45**	NA	**37**	**27**	**200**	**44**	NA	**62**	**49**	**70**	**38**	50
Fluoride	mg/L	<2.0	**0.30**	<2.0	<2.0	<0.20	<2.0	<0.50	<2.0	<2.0	<0.20	**2.3**	**1.9**	<2.0	**2.2**	**2.2**	4
Sulfate	mg/L	NA	**36**	**19**	**56**	**570**	NA	**370**	**140**	**730**	**500**	NA	**390**	**260**	**330**	**340**	154.3
Radium																	
Radium-226	pCi/L	<0.25 (+/-0.13)	<0.193 (+/-0.098)	<0.28 (+/-0.17)	<0.34 (+/-0.18)	NA	**0.49 (+/-0.23)**	**0.32 (+/-0.18)**	<0.23 (+/-0.15)	<0.39 (+/-0.28)	NA	<0.13 (+/-0.11)	**0.2 (+/-0.13)**	<0.61 (+/-0.35)	<0.36 (+/-0.23)	NA	9.32
Radium-228	pCi/L	<0.94 (+/-0.4)	NA	<0.84 (+/-0.42)	<0.79 (+/-0.36)	NA	<0.98 (+/-0.48)	NA	<0.82 (+/-0.39)	<0.81 (+/- 0.4)	NA	<1.01 (+/-0.45)	NA	<0.76 (+/-0.36)	<0.78 (+/-0.38)	NA	
pH																	
pH	s.u.	NA	**7.7**	**7.6**	**7.8**	**6.9**	NA	**7.5**	**7.8**	**7.2**	**6.8**	NA	**7.5**	**8.0**	**7.6**	**7.9**	8.01
Total Dissolved Solids																	
Total Dissolved Solids	mg/L	NA	**260**	**420**	**330**	**1,400**	NA	**1,100**	**570**	**1,300**	**1,300**	NA	**1,200**	**840**	**1,100**	**940**	950.80

= Appendix III constituent (fluoride is included on both Appendix III & IV lists)

= Appendix IV constituent (fluoride is included on both Appendix III & IV lists)

Bold indicates result detected above laboratory reporting limit

1.8 = Appendix IV constituent quantified at Statistically Significant Level (exceeding Groundwater Protection Standard)

NA = Not analyzed for this constituent

TABLE 2

Groundwater Analytical Summary - CCR Rule Assessment Monitoring (2019)

OMU Elmer Smith Station

Owensboro, KY

		Downgradient					Background/Upgradient					Downgradient			
Sample ID		**MW-6**					**MW-7**					**MW-8**			**Groundwater**
Collection Date		4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	12/27/18	5/23/19	11/7/19	**Protection Standard**
Total Metals	**Units**														
Antimony	mg/L	<0.0060	NA	NA	<0.0060	NA	<0.0060	NA	NA	<0.0060	NA	<0.0060	<0.0060	NA	0.006
Arsenic	mg/L	<0.010	NA	NA	<0.010	NA	<0.010	NA	NA	<0.010	NA	<0.010	<0.010	NA	0.010
Barium	mg/L	<0.10	<0.10	<0.10	<0.10	**0.05**	**0.13**	**0.12**	**0.13**	**0.10**	**0.10**	**0.13**	**0.12**	**0.17**	2
Beryllium	mg/L	<0.00040	NA	NA	<0.00040	NA	<0.00040	NA	NA	<0.00040	NA	<0.00040	<0.00040	NA	0.004
Boron	mg/L	NA	**10**	**11**	**9.1**	**13**	NA	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	**0.15**	0.33
Cadmium	mg/L	<0.0050	NA	NA	<0.0050	NA	<0.0050	NA	NA	<0.0050	NA	<0.0050	<0.0050	NA	0.005
Calcium	mg/L	NA	**180**	**170**	**130**	**150**	NA	**100**	**99**	**100**	**97**	**84**	**98**	**100**	139.5
Chromium	mg/L	**0.021**	<0.020	<0.020	<0.020	<0.0050	<0.020	**0.22**	<0.020	**0.020**	**0.020**	<0.020	<0.020	<0.0050	4.10
Cobalt	mg/L	<0.0040	NA	NA	**0.006**	<0.0050	<0.0040	NA	NA	<0.0040	<0.0050	<0.0040	<0.0040	<0.0050	0.098
Lead	mg/L	<0.015	NA	NA	<0.015	NA	<0.015	NA	NA	<0.015	NA	<0.015	<0.015	NA	0.015
Lithium	mg/L	<0.10	NA	NA	<0.010	<0.0050	<0.10	NA	NA	<0.010	<0.0050	<0.10	<0.010	<0.0050	0.040
Mercury	mg/L	<0.00020	NA	NA	<0.00020	NA	<0.00020	NA	NA	<0.00020	NA	<0.00020	<0.00020	NA	0.002
Molybdenum	mg/L	**1.7**	**1.8**	**2.1**	**1.8**	**2**	<0.10	<0.10	<0.10	<0.10	<0.0050	<0.10	<0.10	<0.0050	0.10
Selenium	mg/L	<0.030	NA	NA	**0.035**	**0.047**	<0.030	NA	NA	<0.030	<0.0050	<0.030	<0.030	<0.0050	0.050
Thallium	mg/L	<0.0050	NA	NA	<0.0020	NA	<0.0050	NA	NA	<0.0020	NA	<0.0050	<0.0020	NA	0.002
Anions															
Chloride	mg/L	NA	**130**	**37**	**30**	**31**	NA	**21**	**19**	**15**	**14**	**24**	**31**	**36**	50
Fluoride	mg/L	<2.0	<0.50	<2.0	<2.0	**0.93**	<2.0	**0.22**	<2.0	<2.0	<0.20	<2.0	<2.0	<0.20	4
Sulfate	mg/L	NA	**400**	**550**	**450**	**480**	NA	**84**	**91**	**92**	**62**	**59**	**75**	**69**	154.3
Radium															
Radium-226	pCi/L	<0.19 (+/-0.13)	**0.29 (+/-0.16)**	<0.27 (+/-0.2)	<0.34 (+/-0.19)	NA	**0.21 (+/-0.16)**	**0.32(+/-0.15)**	<0.21 (+/-0.14)	<0.47 (+/-0.27)	NA	<0.28 (+/-0.2)	<0.47 (+/-0.26)	NA	9.32
Radium-228	pCi/L	<0.98 (+/-0.45)	NA	<0.72 (+/-0.34)	<0.78 (+/-0.38)	NA	<0.97 (+/-0.48)	NA	<0.73 (+/-0.36)	<0.80 (+/-0.41)	NA	<0.70 (+/-0.33)	<0.80 (+/-0.36)	NA	
pH															
pH	s.u.	NA	**7.3**	**7.8**	**7.4**	**7.4**	NA	**7.0**	**7.6**	**7.2**	**7.5**	**7.0**	**7.2**	**7.6**	8.01
Total Dissolved Solids															
Total Dissolved Solids	mg/L	NA	**1,500**	**1,100**	**870**	**960**	NA	**570**	**490**	**500**	**500**	**420**	**510**	**510**	950.80

= Appendix III constituent (fluoride is included on both Appendix III & IV lists)

= Appendix IV constituent (fluoride is included on both Appendix III & IV lists)

Bold indicates result detected above laboratory reporting limit

1.8 = Appendix IV constituent quantified at Statistically Significant Level (exceeding Groundwater Protection Standard)

NA = Not analyzed for this constituent

TABLE 2

Groundwater Analytical Summary - CCR Rule Assessment Monitoring (2019)

OMU Elmer Smith Station

Owensboro, KY

Sample ID		Duplicate[1]					Equipment Blank					Groundwater
Collection Date		4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	4/5/18	6/5/18	12/12/18	5/23/19	11/7/19	Protection Standard
Total Metals	**Units**											
Antimony	mg/L	<0.0060	NA	NA	<0.0060	NA	<0.0060	NA	NA	<0.0060	NA	0.006
Arsenic	mg/L	<0.010	NA	NA	<0.010	NA	<0.010	NA	NA	<0.010	NA	0.010
Barium	mg/L	<0.10	<0.10	<0.10	<0.10	**0.05**	<0.10	<0.10	<0.10	<0.10	<0.0050	2
Beryllium	mg/L	<0.00040	NA	NA	<0.00040	NA	<0.00040	NA	NA	<0.00040	NA	0.004
Boron	mg/L	NA	**10**	**0.14**	**9.2**	**13**	NA	<0.10	<0.10	<0.10	**0.1**	0.33
Cadmium	mg/L	<0.0050	NA	NA	<0.0050	NA	<0.0050	NA	NA	<0.0050	NA	0.005
Calcium	mg/L	NA	**180**	**100**	**130**	**150**	NA	<0.20	**0.36**	**<0.20**	**<0.50**	139.5
Chromium	mg/L	**0.020**	<0.020	<0.020	<0.020	<0.0050	<0.020	<0.020	<0.020	<0.020	<0.0050	4.10
Cobalt	mg/L	<0.0040	NA	NA	0.006	<0.0050	<0.0040	NA	NA	<0.0040	<0.0050	0.098
Lead	mg/L	<0.015	NA	NA	<0.015	NA	<0.015	NA	NA	<0.015	NA	0.015
Lithium	mg/L	<0.10	NA	NA	<0.010	<0.0050	<0.10	NA	NA	<0.010	<0.0050	0.040
Mercury	mg/L	<0.00020	NA	NA	<0.00020	NA	<0.00020	NA	NA	<0.00020	NA	0.002
Molybdenum	mg/L	**1.7**	<0.10	<0.10	**1.8**	**2**	<0.10	<0.10	<0.10	<0.10	<0.0050	0.10
Selenium	mg/L	<0.030	NA	NA	**0.037**	**0.046**	<0.030	NA	NA	<0.030	<0.0050	0.050
Thallium	mg/L	<0.0050	NA	NA	<0.0020	NA	<0.0050	NA	NA	<0.0020	NA	0.002
Anions												
Chloride	mg/L	NA	**37**	**18**	**29**	**31**	NA	<1.0	<2.0	<2.0	<0.20	50
Fluoride	mg/L	<2.0	<0.50	<2.0	<2.0	**0.91**	<2.0	<0.10	<2.0	<2.0	<0.20	4
Sulfate	mg/L	NA	**370**	**19**	**450**	**460**	NA	<1.0	<5.0	<5.0	**0.95**	154.3
Radium												
Radium-226	pCi/L	**0.25 (+/-0.16)**	**0.32 (+/-0.17)**	<0.25 (+/-0.15)	<0.47 (+/-0.27)	NA	<0.18 (+/-0.11)	<0.16 (+/-0.12)	<0.38 (+/-0.16)	<0.38 (+/-0.21)	NA	9.32
Radium-228	pCi/L	<0.98 (+/-0.43)	NA	<0.81 (+/-0.41)	<0.78 (+/-0.41)	NA	<1.17 (+/-0.54)	NA	<0.7 (+/-0.31)	<0.82 (+/-0.37)	NA	
pH												
pH	s.u.	NA	**7.4**	**6.1**	**7.5**	**7.0**	NA	**6.6**	**7.4**	**7.0**	**5.5**	8.01
Total Dissolved Solids												
Total Dissolved Solids	mg/L	NA	**1,100**	**420**	**1,000**	**960**	NA	**44**	**30**	**<20**	**26**	950.80

= Appendix III constituent (fluoride is included on both Appendix III & IV lists)

= Appendix IV constituent (fluoride is included on both Appendix III & IV lists)

Bold indicates result detected above laboratory reporting limit

NA = Not analyzed for this constituent

[1]Duplicate sample collected at MW-6 (4/5/18, 5/23/19, and 11/7/19), MW-4 (6/5/18), MW-2 (12/12/18)

APPENDIX I

ASSMESSMENT OF CORRECTIVE MEASURES
60-DAY EXTENSION NOTIFICATION
Owensboro Municipal Utilities – Elmer Smith Station
Owensboro, Daviess County, Kentucky
U.S. EPA Coal Combustion Residuals Rule

March 29, 2019

DEMONSTRATION

Pursuant to 40 CFR §257.96, Owensboro Municipal Utilities (OMU) has initiated an assessment of corrective measures for the Coal Ash Ponds, a coal combustion residuals impoundment located at the Elmer Smith Station in Daviess County, Owensboro, Kentucky. This assessment is being conducted to evaluate the effectiveness of corrective measures being considered for implementation at the facility to address groundwater impacts (molybdenum) that have been quantified at statistically significant levels (SSLs) exceeding the groundwater protection standards (GPWS) in the groundwater monitoring network. OMU will require a 60-day extension to conduct this assessment.

CERTIFICATION

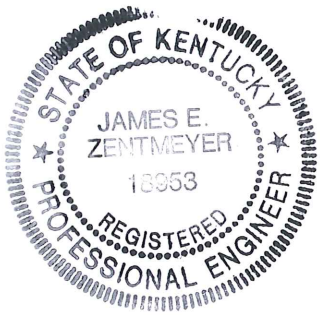
We hereby certify to the best of knowledge, information, and belief that the above demonstration meets the requirements of §257.96(a).

Name of Professional Engineer: James E. Zentmeyer

Signature: _____

Date: 3/29/19

License Number: 18953
My license renewal date is: June 30, 2020



Name of Professional Geologist: Matthew G. Nemecek

Signature: _____

Date: March 29, 2019

License Number: KY-2522
My license renewal date is September: 30, 2019