

**2017 ANNUAL GROUNDWATER MONITORING
AND
CORRECTIVE ACTION REPORT**

**NORTH AND SOUTH ASH IMPOUNDMENTS
MONTROSE GENERATING STATION
CLINTON, MISSOURI**

Presented To:

Kansas City Power & Light Company

Presented By:

SCS ENGINEERS
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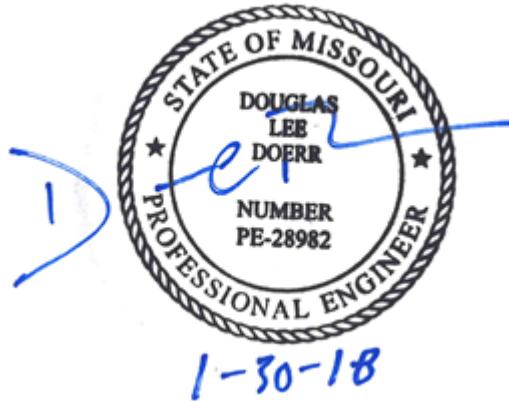
CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2017 Annual Groundwater Monitoring and Corrective Action Report for the North and South Ash Impoundments at the Montrose Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



John R. Rockhold, R.G.
SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2017 Annual Groundwater Monitoring and Corrective Action Report for the North and South Ash Impoundments at the Montrose Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



Douglas L. Doerr, P.E.
SCS Engineers

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1 INTRODUCTION

This 2017 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015). Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2017 Annual Groundwater Monitoring and Corrective Action Report for the multi-unit groundwater monitoring system for the North and South Ash Impoundments at the Montrose Generating Station.

2 § 257.90(e) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. For existing CCR Landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For CCR Landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility’s operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.1 § 257.90(e)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A site map with an aerial image showing the North and South Ash Impoundments and all background (or upgradient) and downgradient monitoring wells with identification numbers for the North and South Ash Impoundments groundwater monitoring program is provided as **Figure 1 in Appendix A**.

2.2 § 257.90(e)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

The CCR groundwater monitoring system was initially certified on October 13, 2017. No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the North and South Ash Impoundments in 2017.

2.3 § 257.90(e)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Only detection monitoring was conducted during the reporting period. Sampling for the detection monitoring program began in December 2015. Samples were analyzed as indicated in **Appendix B, Table 1** (Appendix III and Appendix IV Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection and the results of the analyses are also provided in these tables.

2.4 § 257.90(e)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

There was no transition between monitoring programs in 2017. Only detection monitoring was conducted in 2017. Statistical evaluation of the data was still in process as of the end of 2017.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information if applicable is provided.

2.5.1 § 257.90(e)

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

Collection of initial background groundwater quality data was completed and the initial detection monitoring sampling and analysis event was completed in October 2017. Verification sampling was also conducted per the certified statistical method.

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

Projection of Key Activities for the Upcoming Year (2018).

Completion of statistical evaluation of detection monitoring data. Groundwater sampling and analysis and alternative source demonstration(s) (if required).

2.5.2 § 257.94(d)(3)

Demonstration providing the basis for an alternative monitoring frequency for detection monitoring and certification that it meets the requirements of this section.

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2)

Demonstration that an alternative source other than the CCR unit caused the statistically significant increase (SSI) over background or that the SSI was caused by an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

Not applicable because no such demonstration was conducted.

2.5.4 § 257.95(c)(3)

Demonstration providing the basis for an alternative monitoring frequency for assessment monitoring and certification that it meets the requirements of this section.

Not applicable because no such demonstration was conducted.

2.5.5 § 257.95(d)(3)

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

2.5.6 § 257.95(g)(3)(ii)

Demonstration that an alternative source other than the CCR unit caused the contamination, or that the SSI (during assessment monitoring) resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

Not applicable because no such demonstration was conducted.

2.5.7 § 257.96(a)

Demonstration of the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. In addition, certification of the demonstration is to be included in the annual report.

Not applicable because no such demonstration was conducted.

3 GENERAL COMMENTS

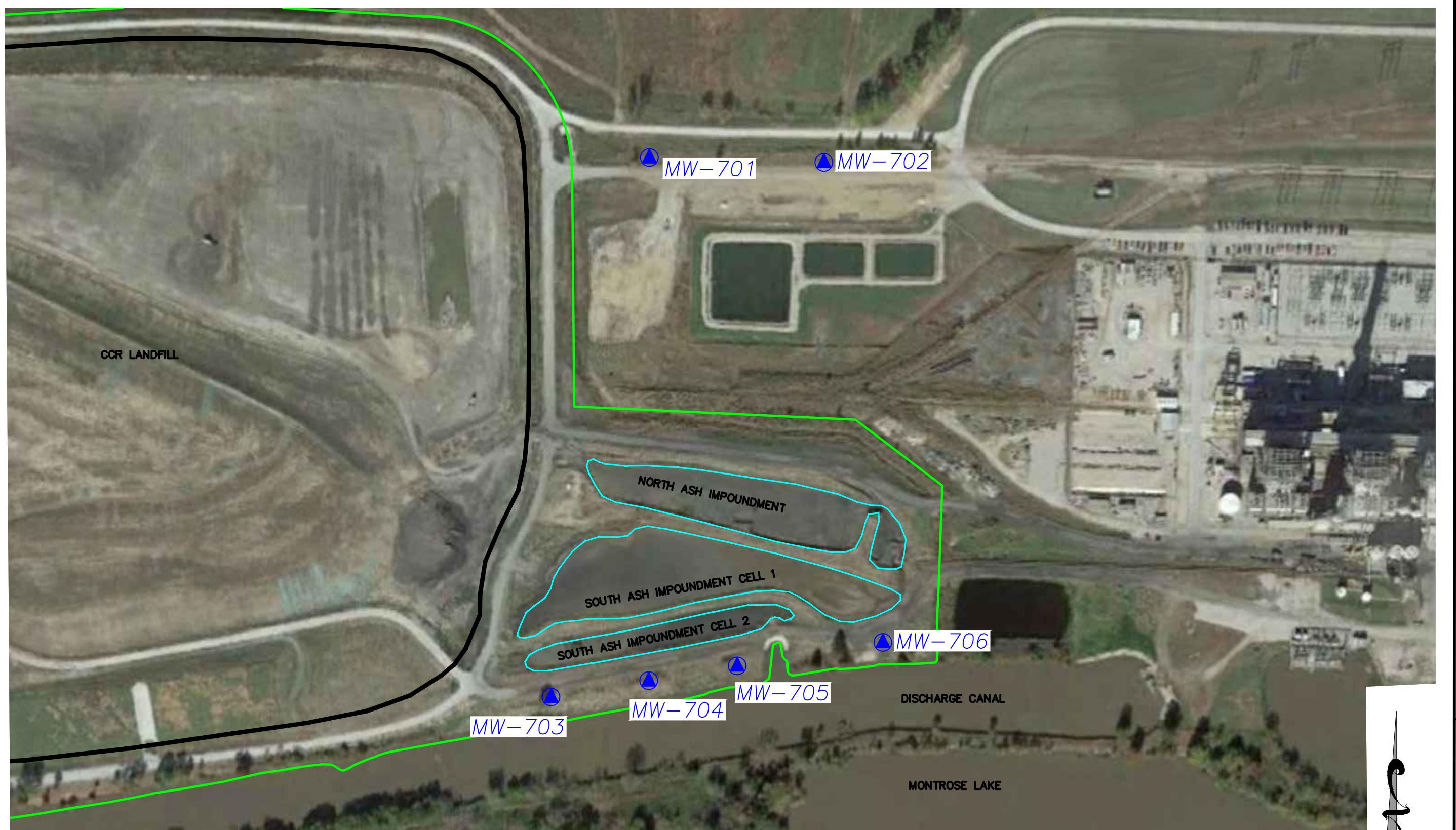
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the conditions encountered at the Montrose Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of KCP&L for specific application to the Montrose Generating Station North and South Ash Impoundments. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map



LEGEND:

- PERMITTED SOLID WASTE FACILITY BOUNDARY (APPROXIMATE)
- CCR LANDFILL UNIT BOUNDARY (APPROXIMATE)
- CCR GROUNDWATER MONITORING SYSTEM WELLS
- ASH IMPOUNDMENT UNIT BOUNDARY (APPROXIMATE)

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED 10/20/2014. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY AECOM



SHEET TITLE		SITE MAP		REV. DATE	CK. BY
NORTH AND SOUTH ASH IMPOUNDMENTS CCR GROUNDWATER MONITORING SYSTEM					
PROJECT TITLE					
2017 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT					

SCS ENGINEERS	CLIENT
ENVIRONMENTAL CONSULTANTS AND CONTRACTORS 7311 W. 130th St., Ste. 100 Overland Park, Kansas 66213 Ph. (913) 881-0300 Fax. (913) 881-0012	KANSAS CITY POWER & LIGHT COMPANY MONTROSE GENERATING STATION MONTROSE, MISSOURI

CADD FILE:	FIGURE NO.:
FIGURE 1-MONT NS ASH IMPD	1

DATE:
1/12/2018

FIGURE NO.
1

APPENDIX B

TABLES

Table 1: Appendix III and Appendix IV Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
North and South Ash Impoundments
Appendix III and Appendix IV Detection Monitoring Results
KCP&L Montrose Generating Station

Well Number	Sample Date	Appendix III Constituents							Appendix IV Constituents														
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Fluoride (mg/L)	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Radium Combined (pCi/L)
MW-701	12/16/2015	<0.2	498	687	1.40	4.12	2060	3830	<0.002	0.00264	0.0174	0.00282	0.00721	<0.01	0.0905	1.40	0.00693	0.249	<0.002	<0.005	0.0129	<0.002	31.85
MW-701	2/16/2016	<0.2	519	688	1.29	4.13	2090	3350	<0.002	0.00252	0.0136	0.00234	0.00649	<0.01	0.0762	1.29	0.00270	0.275	<0.002	<0.005	0.0119	<0.002	1.493
MW-701	5/24/2016	<0.2	504	584	1.37	3.83	2540	3770	<0.002	0.00266	0.0104	0.00291	0.00657	<0.01	0.0509	1.37	<0.002	0.257	0.000267	<0.005	0.0118	<0.002	1.507
MW-701	8/22/2016	<0.2	522	592	1.32	4.37	2020	4030	<0.002	0.00225	0.0111	0.00240	0.00598	<0.01	0.0436	1.32	<0.002	0.244	0.000223	<0.005	0.0126	<0.002	0.855
MW-701	11/8/2016	<0.2	435	367	1.18	4.05	2270	3250	<0.002	0.00236	0.0101	0.00208	0.00575	<0.01	0.0294	1.18	<0.002	0.205	<0.002	<0.005	0.0129	<0.002	1.04
MW-701	2/7/2017	<0.2	367	319	1.12	4.57	1930	3210	<0.002	<0.002	0.00906	0.00205	0.00460	<0.01	0.0196	1.12	<0.02	0.216	<0.002	<0.005	0.0126	<0.02	0.198
MW-701	5/2/2017	<0.2	399	383	1.09	4.24	1940	2920	<0.002	0.00209	0.00897	<0.002	0.00469	<0.01	0.0199	1.09	<0.002	0.226	0.000243	<0.005	0.00883	<0.002	1.44
MW-701	7/31/2017	<0.2	420	353	1.22	4.47	1870	3270	<0.002	0.00201	0.00917	<0.002	0.00465	<0.01	0.0167	1.22	<0.002	0.179	0.000273	<0.005	0.00816	<0.002	1.37
MW-701	10/2/2017	<0.2	469	507	1.17	4.84	1970	3330	<0.002	0.00207	0.00998	0.00202	0.00523	<0.01	0.0370	1.17	<0.002	0.245	<0.002	<0.005	0.00922	<0.002	2.96
MW-701	11/15/2017	---	**450	**398	---	*4.68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-701	12/29/2017	---	---	---	*4.17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-702	12/17/2015	<0.2	522	373	0.329	6.17	1830	3320	<0.002	0.00434	0.0228	<0.002	<0.001	<0.01	<0.01	0.329	0.00251	0.0381	<0.002	<0.005	<0.002	<0.002	0.387
MW-702	2/16/2016	<0.2	519	363	0.277	6.51	1680	2960	<0.002	<0.002	0.0123	<0.002	<0.001	<0.01	<0.01	0.277	<0.002	0.0610	<0.002	<0.005	0.00262	<0.002	0.257
MW-702	5/24/2016	<0.2	491	340	0.179	6.45	1570	2730	<0.002	<0.002	0.0114	<0.002	<0.001	<0.01	<0.01	0.179	<0.002	0.0577	<0.002	<0.005	0.00213	<0.002	1.475
MW-702	8/22/2016	<0.2	522	337	0.214	6.39	1670	3300	<0.002	<0.002	0.0104	<0.002	<0.001	<0.01	<0.01	0.214	<0.002	0.0532	<0.002	<0.005	<0.002	<0.002	0.165
MW-702	11/7/2016	<0.2	490	346	0.244	6.35	1710	2940	<0.002	<0.002	0.00947	<0.002	<0.001	<0.01	<0.01	0.244	<0.002	0.0390	<0.002	<0.005	<0.002	<0.002	2.592
MW-702	2/7/2017	<0.2	450	304	0.208	6.44	1490	3050	<0.002	<0.002	0.0105	<0.002	<0.001	<0.01	<0.01	0.208	<0.02	0.0528	<0.002	<0.005	<0.002	<0.02	0.265
MW-702	5/2/2017	<0.2	439	341	0.221	6.34	1600	3210	<0.002	<0.002	0.0124	<0.002	<0.001	<0.01	<0.01	0.221	<0.002	0.0623	<0.002	<0.005	<0.002	<0.002	1.24
MW-702	7/31/2017	<0.2	497	263	0.217	7.15	1520	2520	<0.002	<0.002	0.0107	<0.002	<0.001	<0.01	<0.01	0.217	<0.002	0.0266	<0.002	<0.005	<0.002	<0.002	4.08
MW-702	10/2/2017	<0.2	522	276	0.267	6.19	1750	3110	<0.002	<0.002	0.00998	<0.002	<0.001	<0.01	<0.01	0.267	<0.002	0.0536	<0.002	<0.005	<0.002	<0.002	1.56
MW-702	11/15/2017	---	**516	**274	---	**6.67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-703	12/17/2015	<0.2	199	22.4	0.343	6.34	996	1350	<0.002	0.00278	0.0511	<0.002	<0.001	<0.01	<0.01	0.343	<0.002	0.0448	<0.002	<0.005	<0.002	<0.002	1.686
MW-703	2/16/2016	<0.2	206	12.8	0.127	6.41	821	1280	<0.002	<0.002	0.0492	<0.002	<0.001	<0.01	<0.01	0.127	<0.002	0.0561	<0.002	<0.005	<0.002	<0.002	1.283
MW-703	5/23/2016	<0.2	215	14.5	0.126	7.88	848	1460	<0.002	<0.002	0.0428	<0.002	<0.001	<0.01	<0.01	0.126	<0.002	0.0561	<0.002	<0.005	<0.002	<0.002	0.644
MW-703	8/22/2016	<0.2	232	15.3	0.137	6.04	897	1500	<0.002	<0.002	0.0394	<0.002	<0.001	<0.01	<0.01	0.137	<0.002	0.0552	<0.002	<0.005	<0.002	<0.002	1.33
MW-703	11/7/2016	<0.2	245	20.0	0.139	6.41	1060	1540	<0.002	<0.002	0.0390	<0.002	<0.001	<0.01	<0.01	0.139	<0.002	0.0517	<0.002	<0.005	<0.002	<0.002	2.407
MW-703	2/7/2017	<0.2	235	20.2	0.116	6.08	1090	1620	<0.002	<0.002	0.0394	<0.002	<0.001	<0.01	<0.01	0.116	<0.002	0.0630	<0.002	<0.005			

Table 2
North and South Ash Impoundments
Detection Monitoring Field Measurements
KCP&L Montrose Generating Station

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (μS)	Temperature ($^{\circ}\text{C}$)	Turbidity (NTU)	Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-701	12/16/2015	4.12	5000	13.66	16.0	5.21	758.27
MW-701	2/16/2016	4.13	5110	12.97	10.4	6.02	757.46
MW-701	5/24/2016	3.83	4900	15.36	3.0	5.88	757.60
MW-701	8/22/2016	4.37	4860	17.50	0.0	7.62	755.86
MW-701	11/8/2016	4.05	4450	18.93	0.0	7.06	756.42
MW-701	2/7/2017	4.57	3940	14.92	0.0	6.01	757.47
MW-701	5/2/2017	4.24	4180	15.36	1.0	4.30	759.18
MW-701	7/31/2017	4.47	3880	18.72	0.4	6.59	756.89
MW-701	10/2/2017	4.84	3720	18.94	0.0	7.64	755.84
MW-701	11/15/2017	*4.68	3900	17.76	0.0	7.56	755.92
MW-701	12/29/2017	*4.17	3480	12.25	0.3	8.36	755.12
MW-702	12/17/2015	6.17	3940	11.70	39.1	4.55	759.20
MW-702	2/16/2016	6.51	3960	12.88	38.9	5.19	758.56
MW-702	5/24/2016	6.45	3900	15.35	40.2	5.55	758.20
MW-702	8/22/2016	6.39	3970	18.00	0.0	7.40	756.35
MW-702	11/7/2016	6.35	4050	17.45	2.6	6.25	757.50
MW-702	2/7/2017	6.44	3850	14.33	0.0	4.98	758.77
MW-702	5/2/2017	6.34	3690	15.98	7.0	3.57	760.18
MW-702	7/31/2017	7.15	3490	19.63	3.0	6.12	757.63
MW-702	10/2/2017	6.19	3340	24.21	3.1	7.21	756.54
MW-702	11/15/2017	**6.67	3370	20.64	0.0	7.25	756.50
MW-703	12/17/2015	6.34	1870	11.79	32.4	11.19	749.24
MW-703	2/16/2016	6.41	1740	13.29	14.6	11.16	749.27
MW-703	5/23/2016	7.88	1680	19.44	0.0	10.81	749.62
MW-703	8/22/2016	6.04	1970	18.01	1.2	11.27	749.16
MW-703	11/7/2016	6.41	2170	18.38	8.6	9.33	751.10
MW-703	2/7/2017	6.08	2150	14.61	10.1	8.93	751.50
MW-703	5/2/2017	6.14	1990	15.78	14.2	8.89	751.54
MW-703	7/31/2017	6.80	2110	20.65	7.1	9.65	750.78
MW-703	10/2/2017	6.04	2180	18.94	7.5	9.40	751.03
MW-703	11/15/2017	**6.08	1800	17.27	4.3	9.13	751.30
MW-704	12/17/2015	6.06	1600	12.94	85.0	10.65	749.23
MW-704	2/16/2016	6.38	1600	13.05	39.7	10.63	749.25
MW-704	5/23/2016	6.44	1490	19.69	46.5	10.27	749.61
MW-704	8/22/2016	6.19	1520	19.27	16.4	10.73	749.15
MW-704	11/7/2016	6.08	1670	19.07	0.0	8.73	751.15
MW-704	2/7/2017	6.27	1630	13.68	1.8	8.39	751.49
MW-704	5/2/2017	6.31	1610	15.67	20.1	8.25	751.63
MW-704	7/31/2017	6.35	1550	18.99	5.3	9.01	750.87
MW-704	10/2/2017	6.25	1570	20.02	4.9	9.38	750.50
MW-704	11/15/2017	**6.19	1460	17.52	4.2	8.60	751.28
MW-705	12/17/2015	6.37	1490	13.77	135.0	8.44	749.49
MW-705	2/16/2016	6.62	1540	13.81	46.2	8.52	749.41
MW-705	5/24/2016	6.52	1420	17.49	35.2	8.21	749.72
MW-705	8/22/2016	6.35	1390	19.01	6.0	8.49	749.44
MW-705	11/8/2016	6.77	1120	18.39	14.5	6.62	751.31
MW-705	2/7/2017	6.11	1580	16.68	13.1	6.35	751.58
MW-705	5/2/2017	6.37	1170	16.59	10.0	6.16	751.77
MW-705	7/31/2017	7.23	1080	21.09	19.9	6.90	751.03
MW-705	10/2/2017	6.31	1190	20.14	9.0	7.17	750.76
MW-705	11/15/2017	**6.36	1260	17.49	4.7	6.53	751.40
MW-706	12/17/2015	6.06	2050	13.29	16.5	9.52	749.68
MW-706	2/16/2016	6.32	2340	14.68	20.5	8.62	750.58
MW-706	5/24/2016	9.13	2120	19.61	19.8	9.23	749.97
MW-706	8/22/2016	6.56	2390	20.37	0.0	9.08	750.12
MW-706	11/8/2016	6.82	2260	20.26	2.6	7.54	751.66
MW-706	2/7/2017	6.33	2190	14.81	1.2	8.61	750.59
MW-706	5/2/2017	6.16	2190	17.17	4.3	7.21	751.99
MW-706	7/31/2017	7.28	2000	22.46	2.3	7.67	751.53
MW-706	10/2/2017	6.19	2030	19.71	2.8	7.79	751.41
MW-706	11/15/2017	**6.81	2030	19.71	2.8	7.51	751.69

* Verification Sample

** Extra Sample Collected per Standard Sampling Procedure

S.U. - Standard Units

μS - Microsiemens

$^{\circ}\text{C}$ - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

--- Not Sampled