



Sixth Annual Groundwater Monitoring and Corrective Action Report

Richmond Power and Light
Whitewater Valley Station Impoundment
Richmond, Indiana

GAI Project Number: C151119.25, Task 004
December 2024



Prepared by: GAI Consultants, Inc.
Pittsburgh Office
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Prepared for: Richmond Power and Light
2000 US Highway 27 South
Richmond, Indiana 47374-7436

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1.0 Introduction

Title 40 Code of Federal Regulations (CFR) §257.90 mandates that existing Coal Combustion Residual (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.90 through §257.98. These requirements are part of the overall CCR Rule (Rule) which was published in the Federal Register on April 17, 2015, and which became effective on October 19, 2015. Specific obligations for Owners and Operators of existing CCR units regarding the preparation of “Annual Groundwater Monitoring and Corrective Action Reports (Annual Report)” are outlined in §257.90(e)(1-5). The Richmond Power and Light (RPL) inactive surface impoundment (Impoundment) was initially addressed under Section §257.100, which allowed for an exemption from many of the Rule requirements and compliance deadlines.

The Rule was amended on August 5, 2016, and the amendment became effective on October 4, 2016. Section §257.100 was amended by removing the exemptions for inactive CCR surface impoundments. The amendment changed the status of inactive CCR impoundments such that they were treated as other CCR units. They were therefore given an extension of the compliance deadlines of 547 days. As a result, the first Annual Report for the Impoundment was placed within the facility’s operating record in August 2019. The second, third, fourth, and fifth Annual Reports were placed within the facility’s operating record in July 2020, August 2021, August 2022, and December 2023, respectively.

The Annual Report must provide information to address the following aspects for the preceding calendar year:

- ▶ document the status of the groundwater monitoring and corrective action program for the respective CCR units;
- ▶ summarize key actions completed;
- ▶ describe any problems encountered and actions taken to resolve the problems; and
- ▶ offer a projection of key activities for the upcoming year.

At a minimum, the Annual Report must contain the following information to the extent applicable and available:

- ▶ a map, aerial image, or diagram showing the CCR unit and all background/upgradient and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program;
- ▶ 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;
- ▶ 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/upgradient and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring (DM) or assessment monitoring (AM) programs;
- ▶ a narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from DM to AM in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and
- ▶ any other information required to be included as specified in §257.90 through §257.98.

The RPL Whitewater Valley Station (Station), is a coal-fired power plant located in Richmond, Wayne County, Indiana (see Figure 1). The Rule applies to this facility because the Station is in operation and has an inactive CCR Surface Impoundment. The CCR unit has a dedicated groundwater monitoring system that was originally installed to comply with Indiana Department of Environmental Management (IDEM) recommendations and was subsequently evaluated and modified (as needed) for use under the CCR program.

In summary, this fifth Annual Report has been prepared to comply with the requirements of §257.90(e), addressing the Whitewater Valley Station's CCR Unit with respect to the groundwater monitoring and corrective actions undertaken from July 2022 through July 2023. This fifth Annual Report and all subsequent reports thereto will be placed in the Station's operating record per §257.105(h)(1), noticed to the State Director per §257.106(h)(1), and posted to the publicly accessible internet site per §257.107(h)(1).

2.0 Impoundment

2.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Impoundment is a subset of the larger site groundwater monitoring system established during original interactions with IDEM regarding the groundwater characterization and monitoring for the site. That larger site system, which is shown on Figure 2, is composed of:

- eight monitoring well (MW) pairs (shallow and deep wells designated as S and D) at locations A through H;
 - ▶ there is a third well at location G, a shallow well designated as MW-GSR, which was installed in place of MW-GS (which was found to have insufficient water for monitoring purposes).
 - ▶ it was determined during the characterization that the deep wells in each well pair would only be used as piezometers.
- seven single, shallow monitoring wells at locations IS through OS;
- two older, shallow wells designated as MW-1 and MW-2 (used only as piezometers);
- nine staff gauges and/or piezometers associated with the groundwater MWs:
 - ▶ five staff gauges (A-1, A-2, A-3, A-4, and P-4) to monitor pond levels; and
 - ▶ four piezometers (PZ-1703, PZ-1704, PZ-1705, and PZ-1706).

Piezometers PZ-1701 and PZ-1702 have been abandoned.

The monitoring wells at locations A through H were installed in 2016. The monitoring wells at locations IS and JS were installed in March 2018. The monitoring wells at locations KS through OS were installed in July 2020.

The CCR groundwater monitoring system is comprised of six wells within the larger site groundwater monitoring system, including one upgradient well (MW-AS) and four downgradient wells (MW-BS, MW-CS, MW-DS, and MW-JS). Note that MW-FS and MW-GSR were previously used as background wells but have since been discontinued as background wells based off IDEM's comments that background wells should be unaffected by facility operations. The screened intervals of the wells monitor the uppermost aquifer on site, a soil aquifer composed of a continuous confined, sand or sand and gravel layer located within or at the base of the glacial till which blankets the site. Figure 3 shows a potentiometric map of the uppermost aquifer based upon water level readings taken during the last round of AM samples in April 2024.

Off-site downgradient monitoring wells (KS, LS, MS, NS, and OS) were installed as part of ongoing groundwater characterization to delineate the extent of the identified release from the CCR unit.

2.2 Data Collection

Per the requirements of §257.95, AM sampling began in September 2019. A summary of each AM sampling event and the parameters analyzed is provided below. The results from all nine AM samplings for the Appendix III and Appendix IV parameters are summarized in the attached Tables 1 and 2, respectively.

Sample Event	Sample Date	Parameters analyzed ¹
AM1	September 2019	App III and App IV
AM2	December 2019	App III and select App IV (detected in AM1)
AM3	March 2020	App III and select App IV (detected in AM2)
AM4	September 2020	App III and App IV
AM5	March 2021	App III and select App IV (detected in AM4)
AM6	September 2021	App III and select App IV (detected in AM5)
AM7 ³	March 2022	App III and App IV
AM8	September 2022	App III and App IV
AM9	April 2023	App III and App IV
AM10	September 2023	App III and App IV
AM11	March 2024	App III and App IV

1. App III and App IV – all CCR Rule Appendix III and Appendix IV parameters were analyzed.
2. Select App IV – CCR Rule Appendix IV parameters that were detected during the previous AM sampling.
3. Due to uncharacteristically high radium-226, radium-228, and total radium results at wells MW-ES, MW-KS, MW-LS, MW-MS, and MW-OS, resamples were collected in June 2022 for those parameters.

Groundwater Protection Standards (GPSs) were determined for the Appendix IV parameters for samples collected in September 2023 and March 2024 and are summarized in Table 3. During the December 2023 and May 2024 reviews of the tenth and eleventh AM sampling events, Lower Confidence Limits (LCLs) were determined. The LCLs were compared to the GPSs and assessment monitoring results, as shown in Table 4. It was determined that there were statistically significant levels (SSLs) of total lithium in downgradient wells MW-BS, MW-CS, and MW-DS; and total molybdenum in downgradient monitoring well MW-BS.

2.3 Monitoring Program Transitions

The Impoundment has been transitioned into the Assessment of Corrective Measures (ACMs), based upon the May 2020 review of the March 2020 AM sampling results.

2.4 Corrective Actions

Completed ACM 2023-2024 activities included the following:

- Semi-Annual Progress Reports describing the progress in selecting and designing a remedy based on the ACM were placed into the operating record in September 2023, as required by §257.97(a).
- Site investigations occurred in December 2021. Investigations consisted of drilling borings along the perimeter of the impoundment and through the interior to determine parameters such as depth and extent of CCR material, depth and extent of clay material, and permeability of material underlying the CCR.
- Submission of an Impoundment Closure Plan to IDEM.

2.5 2024-2025 Projected Activities

Projected key activities for the upcoming year include the following:

- Semi-Annual Progress Reports detailing progress in selecting and designing corrective measure(s).
- Submission of a Final Selection Report detailing the selected corrective measure remedy.
- Generate construction bid documents for closure activities.
- Semi-annual groundwater sampling events to be initiated in September 2024 and March 2025.

TABLES

Table 1
Groundwater Analytical Assessment Monitoring Data - CCR Appendix III Constituents

Well	Parameter:		Boron, Total	Calcium, Total	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
	Date	Unit ¹ :	mg/L	mg/L	mg/L	mg/L	s.u.	mg/L	mg/L
MW-AS	9/16/2019		0.206	93.9	112	0.12	7.3	78.4	568
	12/3/2019		0.213	95.9	116	0.13	7.4	71.2	548
	3/17/2020		0.199	91.2	113	0.1	7.7	77.3	522
	9/16/2020		0.186	101	148	0.1	7.6	72	602
	3/16/2021		0.195	103	138	0.1	7.4	82.6	624
	9/8/2021		0.202	105	145	0.13	7.2	83.9	629
	3/15/2022		0.239	118	142	< 0.10 ²	7.5	87.8	654
	9/27/2022		0.254	110	187	0.12	7.4	78.1	664
	4/4/2023		0.201	111	172	< 0.10	7.4	78.6	606
	9/12/2023		0.208	105	184	< 0.10	7.6	72.2	644
3/13/2024		0.201	103	164	0.12	7.3	68.3	NT	
MW-BS	9/16/2019		4.4	400	224	0.25	7.4	1,300	2,430
	12/3/2019		4.12	393	191	0.23	7.4	1,180	2,280
	3/18/2020		4.38	371	212	0.27	7.7	1,210	2,180
	9/16/2020		4	356	197	0.23	7.6	1,200	2,120
	3/16/2021		4.01	333	188	0.24	7.5	1,140	2,150
	9/8/2021		4.11	365	188	0.25	7.4	1,030	2,060
	3/16/2022		4.35	345	162	0.23	7.5	1,010	2,070
	9/27/2022		4.2	320	171	0.3	7.4	1,050	1,990
	4/5/2023		4.87	347	183	0.20	7.6	1,070	1,960
	9/12/2023		4.63	314	190	0.236	7.4	957	2,060
3/13/2024		5.09	330	199	0.27	7.1	996	NT	
MW-CS	9/16/2019		2.23	275	97.4	0.37	7.2	838	1,600
	12/4/2019		2.35	248	90.2	0.2	7.3	640	1,460
	3/18/2020		2.08	271	107	0.33	7.6	843	1,670
	9/16/2020		2.73	261	93.3	0.36	7.5	772	1,530
	3/16/2021		2.73	261	89.6	0.34	7.4	738	1,550
	9/8/2021		2.82	260	73.8	0.39	7.3	675	1,430
	3/16/2022		2.4	249	51.4	0.32	7.3	519	1,290
	9/27/2022		2.99	257	75.2	0.42	7.6	666	1,370
	4/4/2023		2.87	262	67.1	0.31	7.6	597	1,360
	9/13/2023		3.31	288	88.9	0.33	6.5	709	1,590
3/12/2024		3.31	276	68.8	0.25	7.1	609	NT	

Table 1 (Continued)

Well	Parameter:		Boron, Total	Calcium, Total	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
	Date	Unit ¹ :	mg/L	mg/L	mg/L	mg/L	s.u.	mg/L	mg/L
MW-DS	9/16/2019		7.46	432	173	0.11	7.0	1,100	2,320
	12/4/2019		7.15	417	178	< 0.10	7.3	1,110	2,310
	3/17/2020		6.3	365	137	< 0.10	7.4	960	1,960
	9/17/2020		6.75	387	149	0.11	7.6	1,020	2,190
	3/17/2021		5.57	379	144	< 0.10	7.6	1,000	2,050
	9/9/2021		6.06	409	168	0.11	7.2	1,360	2,120
	3/16/2022		5.03	344	131	< 0.10	7.7	809	1,860
	9/27/2022		5.69	407	170	0.12	7.5	1,040	2,070
	4/4/2023		5.28	390	172	< 0.10	7.8	1,020	1,980
	9/13/2023		6.13	399	189	< 0.10	7.2	935	2,020
3/12/2024		5.30	392	187	0.11	7.0	926	NT	
MW-JS ¹	9/17/2019		1.44	226	49.3	0.18	7.0	351	1,060
	12/3/2019		0.844	152	14.3	0.15	7.1	80.9	561
	3/17/2020		0.837	159	8.7	0.12	7.6	62.1	493
	9/17/2020		1.64	344	234	0.19	7.3	714	1,740
	3/17/2021		0.763	158	34	0.12	7.1	100	498
	9/8/2021		1.62	504	555	0.16	7.0	1,060	3,480
	3/16/2022		1.17	408	676	< 0.10	7.1	1,020	2,530
	9/27/2022		1.7	393	721	0.22	7.0	1,260	2,820
	4/5/2023		0.441	93.8	123	0.11	7.4	211	806
	9/12/2023		1.51	383	792	0.261	7.5	1,200	7,030
3/13/2024		0.456	109	33.9	< 0.10	7.8	85.7	NT	

Notes:

- ¹ mg/L - milligrams per liter; and s.u. - standard units.
- ² < - Represents non-detect. Values are shown at the laboratory reporting limit.
- ³ Well was installed on March 23, 2018.
- ⁴ NT – Due to a lab error, total dissolved solids was not analyzed.

Table 2
Groundwater Analytical Assessment Monitoring Data - CCR Appendix IV Constituents

Well	Parameter:		Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Fluoride	Lead, Total	Lithium, Total	Mercury, Total	Molybdenum, Total	Total Radium ¹	Selenium, Total	Thallium, Total
	Date	Unit ² :	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-AS	9/16/2019		< 0.0010 ³	< 0.0010	0.0913	< 0.00020	< 0.00020	< 0.00020	< 0.0010	0.12	< 0.0010	< 0.020	< 0.0020	0.0055	1.83	< 0.0010	< 0.0010
	12/3/2019			< 0.0010	0.087		< 0.00020	< 0.00020	< 0.0010	0.13	< 0.0010	< 0.020		0.0055	0.776	< 0.0010	
	3/17/2020			0.0010	0.0826		< 0.00020	< 0.0020	< 0.0010	0.10	< 0.0010	< 0.020		0.005	0.783	< 0.0010	
	9/16/2020		< 0.0010	< 0.0010	0.0971	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.10	< 0.0010	< 0.020	< 0.0020	0.0042	0.199	< 0.0010	< 0.0010
	3/16/2021		< 0.0010	0.0017	0.0886	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.10	< 0.0010	< 0.020	< 0.0020	0.0037	0.693	< 0.0010	< 0.0010
	9/8/2021		< 0.0010	< 0.0010	0.103	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.13	< 0.0010	< 0.020	< 0.0020	0.004	0.549	< 0.0010	< 0.0010
	3/15/2022		< 0.0010	0.0017	0.103	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	< 0.020	< 0.0020	0.0036	0.695	< 0.0010	< 0.0010
	9/27/2022		< 0.0010	0.0013	0.112	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.12	< 0.0010	< 0.020	< 0.0020	0.0038	1.26	< 0.0010	< 0.0010
	4/4/2023		< 0.0010	0.0014	0.108	< 0.00020	< 0.00020	< 0.0020	0.0013	< 0.10	< 0.0010	< 0.020	< 0.0020	0.0037	1.04	< 0.0010	< 0.0010
	9/12/2023		< 0.0010	0.0010	0.104	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	< 0.020	< 0.0020	0.0043	1.12	< 0.0010	< 0.0010
3/13/2024		< 0.0010	0.0011	0.0976	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.12	< 0.0010	< 0.020	< 0.0020	0.0038	0.873	< 0.0010	< 0.0010	
MW-BS	9/16/2019		< 0.0010	< 0.0010	0.0202	< 0.00020	< 0.00020	< 0.00020	0.0014	0.25	< 0.0010	0.0608	< 0.0020	0.116	1.76	< 0.0010	< 0.0010
	12/3/2019			< 0.0010	0.0193		< 0.00020	< 0.00020	0.0012	0.23	< 0.0010	0.0827		0.119	1.04	< 0.0010	
	3/18/2020			< 0.0010	0.0195		< 0.00020	< 0.0020	0.0013	0.27	< 0.0010	0.0803		0.108	0.564	< 0.0010	
	9/16/2020		< 0.0010	< 0.0010	0.0189	< 0.00020	< 0.00020	< 0.0020	0.0013	0.23	< 0.0010	0.0842	< 0.0020	0.116	1.62	< 0.0010	< 0.0010
	3/16/2021		< 0.0010	< 0.0010	0.0173	< 0.00020	< 0.00020	< 0.0020	0.0013	0.24	< 0.0010	0.0779	< 0.0020	0.113	0.37	< 0.0010	< 0.0010
	9/8/2021		< 0.0010	< 0.0010	0.0181	< 0.00020	< 0.00020	< 0.0020	0.0012	0.25	< 0.0010	0.0666	< 0.0020	0.116	0.854	< 0.0010	< 0.0010
	3/16/2022		< 0.0010	< 0.0010	0.0182	< 0.00020	< 0.00020	< 0.0020	0.0012	0.23	< 0.0010	0.0765	< 0.0020	0.115	0.651	< 0.0010	< 0.0010
	9/27/2022		< 0.0010	< 0.0010	0.0186	< 0.00020	< 0.00020	< 0.0020	0.0017	0.3	< 0.0010	0.0885	< 0.0020	0.118	1.05	< 0.0010	< 0.0010
	4/5/2023		< 0.0010	< 0.0010	0.0198	< 0.00020	< 0.00020	< 0.0020	0.0012	0.20	< 0.0010	0.0766	< 0.0020	0.115	0.807	< 0.0010	< 0.0010
	9/12/2023		< 0.0010	< 0.0010	0.0189	< 0.00020	< 0.00020	< 0.0020	0.0011	0.236	< 0.0010	0.0736	< 0.0020	0.119	1.02	< 0.0010	< 0.0010
3/13/2024		< 0.0010	< 0.0010	0.0180	< 0.00020	< 0.00020	< 0.0020	0.0012	0.27	< 0.0010	0.0753	< 0.0020	0.110	0.486	< 0.0010	< 0.0010	
MW-CS	9/16/2019		< 0.0010	0.0017	0.0248	< 0.00020	< 0.00020	< 0.00020	0.0023	0.37	< 0.0010	0.0432	< 0.0020	0.126	0.937	< 0.0010	< 0.0010
	12/4/2019			0.0014	0.0211		< 0.00020	< 0.00020	0.0014	0.2	< 0.0010	0.0598		0.11	0.195	0.0022	
	3/18/2020			0.0013	0.0248		< 0.00020	< 0.0020	0.0013	0.33	< 0.0010	0.0505		0.102	0.43	0.0053	
	9/16/2020		< 0.0010	0.0017	0.0244	< 0.00020	< 0.00020	< 0.0020	0.0014	0.36	< 0.0010	0.0705	< 0.0020	0.126	0.946	0.0035	< 0.0010
	3/16/2021		< 0.0010	0.0015	0.022	< 0.00020	< 0.00020	< 0.0020	0.0015	0.34	< 0.0010	0.0603	< 0.0020	0.108	0.875	0.0057	< 0.0010
	9/8/2021		< 0.0010	0.0019	0.023	< 0.00020	< 0.00020	< 0.0020	0.0012	0.39	< 0.0010	0.0625	< 0.0020	0.101	0.272	0.0039	< 0.0010
	3/16/2022		< 0.0010	0.0018	0.0207	< 0.00020	< 0.00020	< 0.0020	0.0011	0.32	< 0.0010	0.0580	< 0.0020	0.0831	1.13	0.0108	< 0.0010
	9/27/2022		< 0.0010	0.0020	0.0243	< 0.00020	< 0.00020	< 0.0020	0.0017	0.42	< 0.0010	0.0702	< 0.0020	0.1050	0.678	0.0042	< 0.0010
	4/4/2023		< 0.0010	0.0016	0.0227	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.31	< 0.0010	0.0593	< 0.0020	0.0792	0.633	0.0078	< 0.0010
	9/13/2023		< 0.0010	0.0018	0.0275	< 0.00020	< 0.00020	< 0.0020	0.0012	0.33	< 0.0010	0.0766	< 0.0020	0.0795	1.07	0.0014	< 0.0010
3/12/2024		< 0.0010	0.0014	0.0222	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.25	< 0.0010	0.0717	< 0.0020	0.0605	0.324	0.0098	< 0.0010	

Table 2 (Continued)

Well	Parameter:		Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Fluoride	Lead, Total	Lithium, Total	Mercury, Total	Molybdenum, Total	Total Radium ¹	Selenium, Total	Thallium, Total
	Date	Unit ² :	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-DS	9/16/2019		< 0.0010	< 0.0010	0.0306	< 0.00020	< 0.00020	< 0.00020	< 0.0010	0.11	< 0.0010	0.0422	< 0.0020	0.0091	1.4	< 0.0010	< 0.0010
	12/4/2019			< 0.0010	0.0267		< 0.00020	< 0.00020	< 0.0010	< 0.10	< 0.0010	0.0602		0.0083	0.464	< 0.0010	
	3/17/2020			< 0.0010	0.0233		< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	0.0489		0.0062	0.336	< 0.0010	
	9/17/2020		< 0.0010	< 0.0010	0.0302	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.11	< 0.0010	0.0620	< 0.0020	0.0073	0.567	< 0.0010	< 0.0010
	3/17/2021		< 0.0010	< 0.0010	0.0206	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	0.0454	< 0.0020	0.0058	0.809	< 0.0010	< 0.0010
	9/9/2021		< 0.0010	< 0.0010	0.0272	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.11	< 0.0010	0.0431	< 0.0020	0.0063	0.511	< 0.0010	< 0.0010
	3/16/2022		< 0.0010	< 0.0010	0.0176	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	0.0327	< 0.0020	0.0071	1.13	< 0.0010	< 0.0010
	9/27/2022		< 0.0010	< 0.0010	0.0250	< 0.00020	< 0.00020	< 0.0020	0.0016	0.12	< 0.0010	0.0605	< 0.0020	0.0071	1.06	< 0.0010	< 0.0010
	4/4/2023		< 0.0010	< 0.0010	0.0228	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	0.0375	< 0.0020	0.0058	0.709	0.0011	< 0.0010
	9/13/2023		< 0.0010	< 0.0010	0.0222	< 0.00020	< 0.00020	< 0.0020	< 0.0010	< 0.10	< 0.0010	0.0530	< 0.0020	0.0084	0.530	< 0.0010	< 0.0010
3/12/2024		< 0.0010	< 0.0010	0.0212	< 0.00020	< 0.00020	< 0.0020	< 0.0010	0.11	< 0.0010	0.0570	< 0.0020	0.0073	0.913	0.0010	< 0.0010	
MW-JS ⁴	9/17/2019		< 0.0010	0.0041	0.172	< 0.00020	0.0004	0.004	0.0052	0.18	0.0028	0.0348	< 0.0020	0.0265	1.33	0.0015	< 0.0010
	12/3/2019			0.0064	0.134		< 0.00020	0.0124	0.0046	0.15	0.0036	0.025		0.0176	1.2	0.0032	
	3/17/2020			0.0071	0.147		< 0.00020	0.0073	0.0051	0.12	0.0041	0.0282		0.017	0.976	0.0093	
	9/17/2020		< 0.0010	0.0052	0.145	< 0.00020	0.00039	0.0039	0.0056	0.19	0.0024	0.0782	< 0.0020	0.03	2.05	0.0012	< 0.0010
	3/17/2021		< 0.0010	0.0016	0.0727	< 0.00020	< 0.00020	< 0.0020	0.0016	0.12	< 0.0010	0.0258	< 0.0020	0.0109	0.62	0.0084	< 0.0010
	9/8/2021		< 0.0010	0.0086	0.170	0.00021	0.00057	0.0067	0.0093	0.16	0.004	0.0636	< 0.0020	0.0278	2.05	0.0021	< 0.0010
	3/16/2022		< 0.0010	0.0015	0.245	< 0.00020	0.00062	0.0022	0.0046	< 0.10	< 0.0010	0.0392	< 0.0020	0.0114	1.27	0.0048	< 0.0010
	9/27/2022		< 0.0010	0.0114	0.15	0.00021	0.00051	0.0070	0.0135	0.22	0.0053	0.0758	< 0.0020	0.0345	2.11	0.0020	< 0.0010
	4/5/2023		< 0.0010	< 0.0010	0.0650	< 0.00020	< 0.00020	< 0.0020	0.0016	0.11	< 0.0010	< 0.020	< 0.0020	0.0062	0.871	0.0090	< 0.0010
	9/12/2023		< 0.0010	0.0028	0.0784	< 0.00020	0.00041	< 0.0020	0.0081	0.261	0.0014	0.0450	< 0.0020	0.0370	1.05	0.0022	< 0.0010
3/13/2024		< 0.0010	0.0010	0.0724	< 0.00020	< 0.00020	< 0.0020	0.0021	< 0.10	< 0.0010	< 0.020	< 0.0020	0.0074	0.747	0.0079	< 0.0010	

Notes:

- ¹ Total Radium is Radium-226 and Radium-228 combined
- ² mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- ³ < - Represents non-detect. Values are shown at the laboratory reporting limit.
- ⁴ Well was installed on March 23, 2018.

Table 3
Groundwater Protection Standards Development

Chemical Name	Unit ¹	Samples	Detected	% Non-Detect	Transformed	Method	Upper Tolerance Limit	Federal Limit	Federal Limit Type ²	GPS ³
Antimony, Total	mg/L	11	0	100	No	Non-Parametric	0.001	0.006	MCL	0.006
Arsenic, Total	mg/L	13	3	76.9	No	Non-Parametric	0.0017	0.01	MCL	0.01
Barium, Total	mg/L	13	13	0.0	No	Parametric	0.134	2	MCL	2
Beryllium, Total	mg/L	11	0	100	No	Non-Parametric	0.0002	0.004	MCL	0.004
Cadmium, Total	mg/L	13	0	100	No	Non-Parametric	0.0002	0.005	MCL	0.005
Chromium, Total	mg/L	13	0	100	No	Non-Parametric	0.002	0.1	MCL	0.1
Cobalt, Total	mg/L	13	0	100	No	Non-Parametric	0.001	0.006	RSL	0.006
Fluoride	mg/L	14	11	21.4	No	Parametric	0.168	4	MCL	4
Lead, Total	mg/L	13	0	100	No	Non-Parametric	0.001	0.015	RSL	0.015
Lithium, Total	mg/L	13	0	100	No	Non-Parametric	0.02	0.040	RSL	0.040
Mercury, Total	mg/L	11	0	100	No	Non-Parametric	0.002	0.002	MCL	0.002
Molybdenum, Total	mg/L	13	13	0.0	No	Parametric	0.006	0.1	RSL	0.1
Total Radium	pCi/l	13	13	0.0	No	Parametric	2.363	5	MCL	5
Selenium, Total	mg/L	13	0	100	No	Non-Parametric	0.001	0.05	MCL	0.05
Thallium, Total	mg/L	11	0	100	No	Non-Parametric	0.001	0.002	MCL	0.002

Notes:

- ¹ mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- ² MCL - United States Environmental Protection Agency (USEPA) Maximum Contaminant Level; and RSL - USEPA Regional Screening Level.
- ³ GPS is defined as the higher of the federal limit and the calculated site-specific background.

Table 4
Groundwater Protection Standard and Lower Confidence Level Comparison

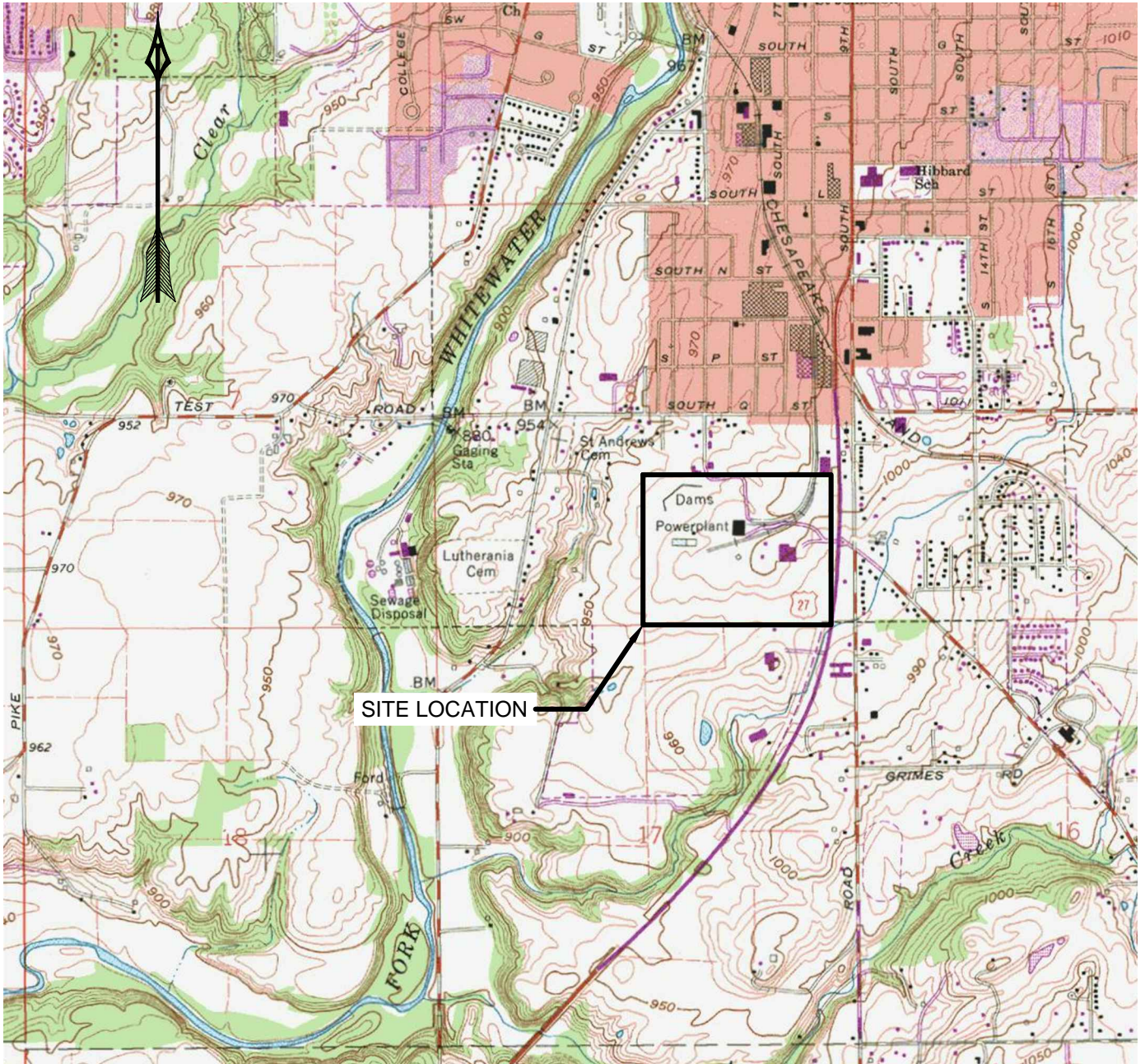
Parameter	GPS	Location ID: Units ²	LCL ¹							
			MW-BS		MW-CS		MW-DS		MW-JS	
			September 2023	March 2024	September 2023	March 2024	September 2023	March 2024	September 2023	March 2024
Antimony, Total	0.006	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic, Total	0.01	mg/L	0.001	0.001	0.0014	0.0014	0.001	0.001	0.002	0.002
Barium, Total	2	mg/L	0.019	0.019	0.0210	0.0211	0.0241	0.0240	0.112	0.108
Beryllium, Total	0.004	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Cadmium, Total	0.005	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Chromium, Total	0.1	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.0027	0.0026
Cobalt, Total	0.006	mg/L	0.0013	0.0013	0.0015	0.0015	0.001	0.001	0.003	0.003
Fluoride	4	mg/L	0.194	0.197	0.268	0.267	0.10	0.10	0.142	0.138
Lead, Total	0.015	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.0015	0.0015
Lithium, Total	0.040	mg/L	0.0774 ³	0.0773	0.0593	0.0599	0.0479	0.0484	0.0292	0.0284
Mercury, Total	0.002	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Molybdenum, Total	0.1	mg/L	0.116	0.116	0.0953	0.0923	0.007	0.007	0.0175	0.0164
Total Radium	5	pCi/l	0.828	0.805	0.538	0.524	0.519	0.540	1.05	1.02
Selenium, Total	0.05	mg/L	0.001	0.001	0.0018	0.0024	0.001	0.001	0.0031	0.0034
Thallium, Total	0.002	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Notes:

- ¹ LCLs were determined for samples collected during the eighth and ninth Assessment Monitoring events in September 2022 and April 2023, respectively.
- ² mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- ³ Highlighted values indicate a SSL.

FIGURES


GAI CAD FILE PATH: Z:\Energy\2015\C151119.04 - RPL_GW IDEM Closure Nar\CAD\Production Drawings\C151119-04-002-001-A2-001.dwg



MAP REFERENCE:
 RICHMOND, IN 7.5 MINUTE
 QUADRANGLE DATED 1960
 PHOTO REVISED 1981

SCALE: 1" = 2000'



DRAWING TITLE		GAI DRAWING NUMBER:		
FIGURE 1 - SITE LOCATION MAP		A2-001		
PROJECT		GAI FILE NUMBER:		
WHITewater IDEM CLOSURE PLAN		C151119-04-002-001-A2-001		
CLIENT		DRAWN BY:	CHECKED BY:	APPROVED BY:
RICHMOND POWER AND LIGHT COMPANY RICHMOND, INDIANA		MAYHOEJ		
		SHEET NO.:	SCALE:	ISSUE DATE:
		1 OF 1	AS SHOWN	08/16/2016
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PLOTTED ON: 8/17/2016 10:38:44 AM PLOTTED BY: William Harris PLOT FILE: GAI.stb

PLOTTED ON: 11/30/2023 12:56:26 PM PLOTTED BY: Ed Mayhood PLOT FILE: GAI.stb



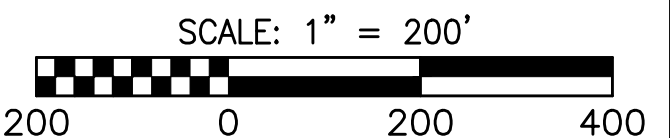
REFERENCE:
 2012 INDIANA STATEWIDE IMAGERY AND LIDAR PROGRAM
 1-FOOT PIXEL RESOLUTION ORTHOIMAGERY; AND
 2-FOOT CONTOUR INTERVALS LINES DEVELOPED FROM 1.5 METER NPS BARE EARTH LIDAR.

IMPOUNDMENT SURVEY PROVIDED BY BEALS-MOORE & ASSOCIATES, INC. DATED JANUARY 1ST, 2013
 50 SCALE MAPPING WITH 1 FOOT CONTOUR INTERVAL

SURVEY FOR BORING, PIEZOMETER AND STAFF GAUGE LOCATIONS AND ELEVATIONS PROVIDED BY BEALS-MOORE & ASSOCIATES, INC. DATED APRIL 15TH, 2016, SEPTEMBER 27, 2016, JULY 10, 2017 AND AUGUST 26, 2020.

LEGEND

- ▲ A-2 STAFF GAUGE LOCATION
- ⊕ A-S MONITORING WELL, PIEZOMETER LOCATION
- ⊕ PZ-1701 ABANDONED MONITORING WELL, PIEZOMETER LOCATION
- - - APPROXIMATE LIMIT OF IMPOUNDMENT

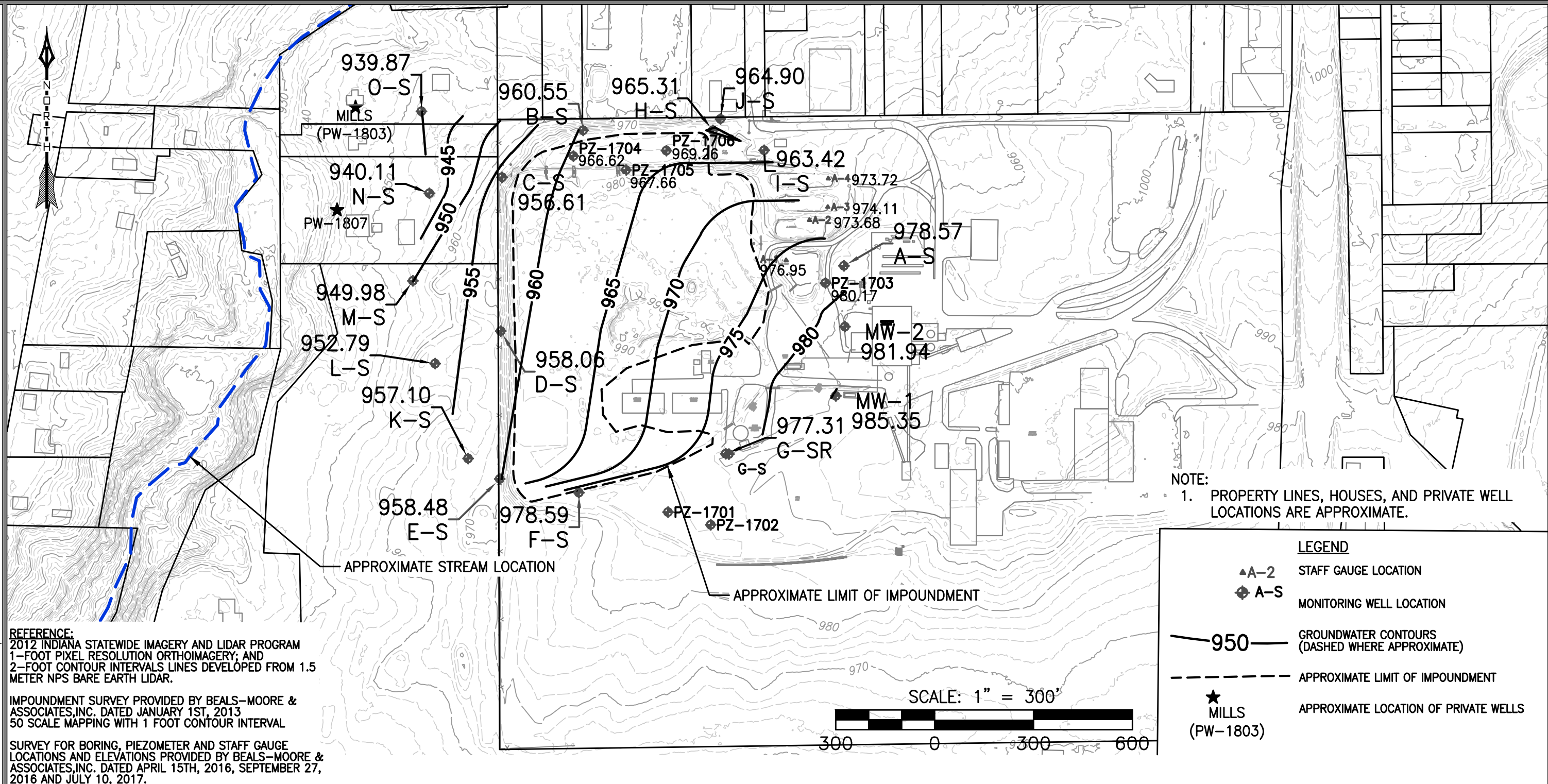


NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:
2	11/30/2023	MAYHOEJ	BORTZKM	BORTZKM	UPDATED IMAGERY

REVISION RECORD

DRAWING TITLE		
FIGURE 2 - GROUND WATER MONITORING SYSTEM LOCATION MAP		
PROJECT		CLIENT
IMPOUNDMENT CLOSURE WHITewater VALLEY STATION WAYNE COUNTY RICHMOND, INDIANA 47374	gai consultants	RICHMOND POWER & LIGHT 2000 US 27 SOUTH RICHMOND, INDIANA 47374

DRAWN BY: MAYHOEJ	CHECKED BY: TURKARJ	APPROVED BY: TURKARJ
REVISION	SCALE: AS SHOWN	ISSUE DATE: 08/31/2020
2	SHEET NO.: 1 OF 1	
GAI FILE NUMBER: C151119-22-000-000-B2-003		
GAI DRAWING NUMBER: B2-003		



NOTE:
1. PROPERTY LINES, HOUSES, AND PRIVATE WELL LOCATIONS ARE APPROXIMATE.

LEGEND


- ▲ A-2 STAFF GAUGE LOCATION
- ◆ A-S MONITORING WELL LOCATION
- 950 — GROUNDWATER CONTOURS (DASHED WHERE APPROXIMATE)
- - - - - APPROXIMATE LIMIT OF IMPOUNDMENT
- ★ MILLS (PW-1803) APPROXIMATE LOCATION OF PRIVATE WELLS

REFERENCE:
2012 INDIANA STATEWIDE IMAGERY AND LIDAR PROGRAM
1-FOOT PIXEL RESOLUTION ORTHOIMAGERY; AND
2-FOOT CONTOUR INTERVALS LINES DEVELOPED FROM 1.5
METER NPS BARE EARTH LIDAR.

IMPOUNDMENT SURVEY PROVIDED BY BEALS-MOORE &
ASSOCIATES, INC. DATED JANUARY 1ST, 2013
50 SCALE MAPPING WITH 1 FOOT CONTOUR INTERVAL

SURVEY FOR BORING, PIEZOMETER AND STAFF GAUGE
LOCATIONS AND ELEVATIONS PROVIDED BY BEALS-MOORE &
ASSOCIATES, INC. DATED APRIL 15TH, 2016, SEPTEMBER 27,
2016 AND JULY 10, 2017.

NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:
REVISION RECORD					

DRAWING TITLE		
POTENTIOMETRIC SURFACE MAP - SOIL - MARCH 12, 2024		
PROJECT		CLIENT
IMPOUNDMENT CLOSURE WHITewater VALLEY STATION WAYNE COUNTY RICHMOND, INDIANA 47374	gai consultants	RICHMOND POWER & LIGHT 2000 US 27 SOUTH RICHMOND, INDIANA 47374

DRAWN BY:	CHECKED BY:	APPROVED BY:
RHULL	HENGELM	HENGELM
REVISION	SCALE:	ISSUE DATE:
0	AS SHOWN	08/03/2021
SHEET NO.:		
1 OF 1		
GAI FILE NUMBER:		
C151119-22-000-000-B2-025		
GAI DRAWING NUMBER:		
B2-025		

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