Annual Groundwater Monitoring and Corrective Action Report

Appalachian Power Company

Clinch River Plant

Pond 1 CCR Management Unit

Cleveland, Virginia

January 31, 2021

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I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared to report the status of activities for the preceding year for an inactive surface impoundment CCR unit at Appalachian Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP) Clinch River Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring and Corrective Action Report be posted to the operating record by August 1, 2019 and annually thereafter for inactive surface impoundments. The second annual report was prepared on January 31, 2020 to cover the 2019 activities, and future reports will be submitted annually on January 31st. This report is being prepared by January 31, 2021 to cover groundwater monitoring activities in 2020.

In general, the following activities were completed:

- An assessment monitoring program was established for Pond 1 on July 15, 2019. The CCR Unit remained in assessment monitoring through the start and end of the current annual reporting period;
- On October 13, 2019 an Assessment of Corrective Measures (ACM) for Pond 1 was initiated. The ACM was completed on December 11, 2019, and a public meeting to discuss the proposed remedies was held on December 19, 2019;
- Two additional Nature and Extent Study (NES) wells were installed in 2020 for a total of 15 NES wells. It was determined that the plume migrated off AEP owned property; therefore, a notification was made to the adjacent landowners on May 13, 2020;
- Two semi-annual progress report on selecting a remedy pursuant to § 257.97 were completed on July 20, 2020 and 1/20/2021. A remedy has not yet been selected;
- Groundwater samples were collected and analyzed for Appendix III and Appendix IV constituents, as specified in 40 CFR 257.95 *et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2016)* in February, April, and October 2020;
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- Analytical results of the February, April, and October rounds of sampling are listed in the tables in **Appendix 1**. Also shown are the groundwater flow rates and flow directions;
- Statistical analysis reports of the April 2020 sampling event are attached in **Appendix 2.** The following Appendix IV parameters exceeded established groundwater protection standards:
    - Barium at wells MW-1604
    - Cobalt in wells MW-1607 and MW-1610

- Lithium at wells MW-1606 and MW-1607
- Molybdenum at wells MW-1607 and MW-1610

The following Appendix III parameters exceeded background:

- Calcium at MW-1603; MW-1604; MW-1605; and MW-1612
- Chloride at MW-1603; MW-1605; MW-1606; and MW-1607
- Sulfate at MW-1606 and MW-1607
- pH at wells MW-1603; MW-1604; and MW-1612

- A statistical process in accordance with 40 CFR 257.93 to evaluate groundwater data was updated, certified, and posted to AEP's CCR website in October 2020. AEP's *Statistical Analysis Plan (*Geosyntec 2020). The statistical process was guided by USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* ("Unified Guidance", USEPA, 2009); and
- The October 2020 data are still undergoing statistical analysis.

The major components of this annual report, to the extent applicable at this time, are presented in sections that follow:

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers (Attached as **Appendix 1**);
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of background, detection monitoring, or assessment monitoring programs (Attached as **Appendix 1**);
- Statistical comparison of monitoring data to determine if there have been significant increase over background concentrations (Attached as **Appendix 2**, where applicable);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**, where applicable);
- A summary of any transition between monitoring programs, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a statistically significant increase over background concentrations (Notices Attached as **Appendix 4**, where applicable);
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened (Attached as **Appendix 5**, where applicable); and

- Other information required to be included in the annual report such as alternate source demonstration or assessment of corrective measures, if applicable.

In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

There are three hydrogeological formations monitored at the facility: the Rome, Chattanooga, and Dumps Fault. The following is a list of wells (S = Shallow zone, D = Deep zone):

Rome Formation

Upgradient wells: MW-1609

Downgradient wells: MW-1606 and MW-1607

Nature and Extent wells: W-1906(S, D); W-1907(S, D), W-1913(S, D)

Chattanooga Formation

Upgradient wells: MW-1601; MW1602; and MW-1608

Downgradient wells: MW-1603; MW-1604; MW-1605; and MW-1612

Nature and Extent wells: W-1903(S, D); W-1904(S, D); W-1905(S, D); and W-2012(S, D)

Dumps Fault Formation

Upgradient wells: MW-1611

Downgradient wells: MW-1610

Nature and Extent wells: W-1910S

A figure that depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers is provided in **Appendix 1**.

III. Monitoring Wells Installed or Decommissioned

The network design, as summarized in the *Groundwater Monitoring Network Design Report* (2019) and as posted at the CCR website for Clinch River Plant, did not change. That design report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

Since the facility entered assessment monitoring and no alternative source was identified, we installed an additional 13 monitoring wells after initiating the assessment of corrective measures in 2019 to define the horizontal and vertical extent of constituents exceeding the groundwater protections standards at statistically significant levels. Six clusters of shallow and deep wells, and

one shallow only well were installed near Dumps Creek and the Clinch River downgradient of the ash pond. The monitoring wells installed at the end of 2019 and were documented in last year's annual report. In 2020, two additional monitoring wells were installed to help define the extent of the plume. The monitoring well installation reports for those two wells are included in **Appendix 5.**

IV. Groundwater Quality Data and Static Water Elevation Data, With Flow Rate and Direction Calculations and Discussion

Appendix 1 contains tables showing the groundwater quality data collected during the establishment of background quality, detection and assessment monitoring. Static water elevation data from each monitoring event also are shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

V. Groundwater Quality Data Statistical Analysis

Statistical analysis of the assessment monitoring samples taken in April 2020 was completed in August 2020. The full report is included in **Appendix 2.** The following Appendix IV parameters exceeded established groundwater protection standards:

- Barium at wells MW-1604
- Cobalt in wells MW-1607 and MW-1610
- Lithium at wells MW-1606 and MW-1607
- Molybdenum at wells MW-1607 and MW-1610

The following Appendix III parameters exceeded background:

- Calcium at MW-1603; MW-1604; MW-1605; and MW-1612
- Chloride at MW-1603; MW-1605; MW-1606; and MW-1607
- Sulfate at MW-1606 and MW-1607
- pH at wells MW-1603; MW-1604; and MW-1612

The statistical analysis of the second semi-annual sampling event will be completed within 90 days of finishing the sampling and analysis, which took place in October 2020.

VI. Discussion about Transition between Monitoring Requirements or Alternate Monitoring Frequency

A notification that Pond 1 established an assessment monitoring program was placed in the Operating Record on August 1, 2019 in accordance with the requirement of 257.94(e)(3). Pond 1 also initiated and completed an Assessment of Corrective Measures by December 11, 2019. A public meeting was held on December 19, 2019 to discuss the proposed remedies.

As of the writing of this report, there has been no remedy selected pursuant to § 257.97. Two semi-annual reports discussing the progress towards selecting a remedy have been prepared. The CCR Unit will continue to sample according to the assessment monitoring program.

VII. Other Information Required

Pond 1 has progressed from detection monitoring to its current status in assessment and corrective action monitoring. All required information has been included in this annual groundwater monitoring report.

VIII. Description of Any Problems Encountered and Actions Taken

No significant problems were encountered. The low flow sampling effort went smoothly and the schedule was met to support the annual groundwater report preparation.

IX. A Projection of Key Activities for the Upcoming Year

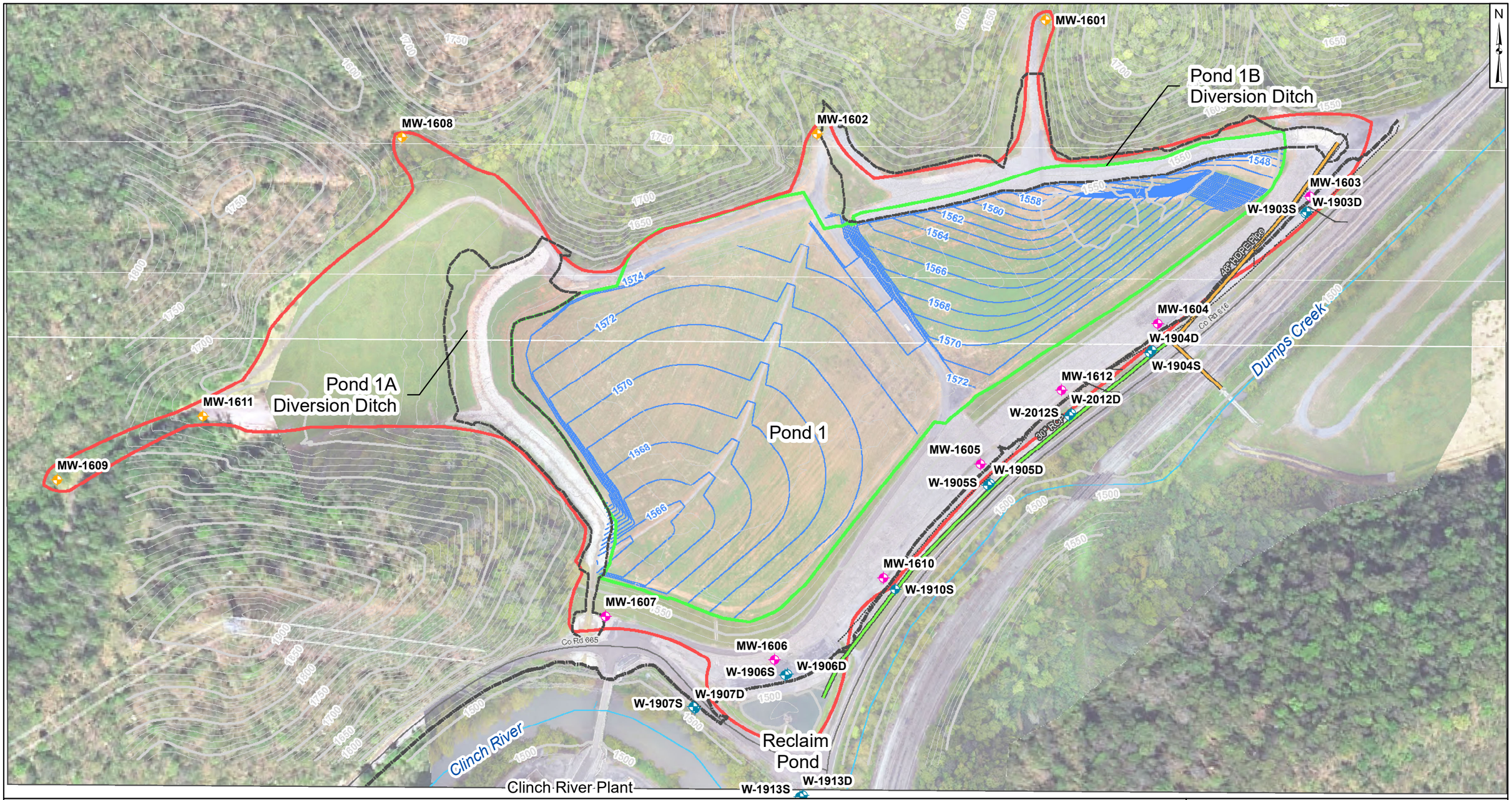
Key activities for 2021 include:

- Assessment monitoring on a twice per year schedule
- Semi-annual progress report on selecting and designing remedial alternatives.
- Responding to any new data received in light of what the CCR rule requires
- Preparation of the annual groundwater report

APPENDIX 1 – Groundwater Data Tables and Figures

Figures and Tables follow, showing the groundwater monitoring network, data collected and the rate and direction of groundwater flow. The dates that the samples were collected and it also is shown whether the data were collected under background, detection, or assessment monitoring.

Groundwater Monitoring Network Figure



Legend

- Upgradient Monitoring Location
- Downgradient Monitoring Location
- Nature and Extent Well
- Post-Closure Topographic Elevation
- 100 yr Flood Elevation Approx. 1505 ft amsl
- Diversion Ditch
- Facility Boundary
- Pond 1 CCR Unit Boundary

Notes

- Aerial basemap provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015).
- Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).

300 150 0 300 Feet

Site Layout
Pond 1

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia

Geosyntec consultants

Ann Arbor, Michigan | 2021/01/14

Figure **1**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Clinch River\2020\AEP-ClinchRiver_Pond1_SiteLayout.mxd. ARevezzo. 1/14/2021. CHA8423.

Groundwater Data Tables

Table 1 - Groundwater Data Summary: MW-1601
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.447	5.58	23.8	1.86	7.8	166	1,180
12/12/2017	Background	0.473	5.88	31.9	1.82	8.3	250	1,340
2/13/2018	Background	0.496	5.99	30.8	2.13	8.4	248	1,380
4/11/2018	Background	0.514	7.49	41.0	2.10	8.3	319	1,620
6/7/2018	Background	0.576	6.34	31.4	2.22	8.4	245	1,440
8/20/2018	Background	0.517	8.42	45.8	2.10	8.3	358	1,730
10/17/2018	Background	0.542	6.84	34.3	2.20	8.5	258	1,500
12/6/2018	Background	0.593	5.65	28.1	2.22	8.5	210	1,410
2/7/2019	Detection	0.526	5.50	24.0	2.32	8.4	184	1,370
4/8/2019	Assessment	0.577	5.90	25.2	2.18	8.4	173	1,390
5/28/2019	Assessment	0.541	5.21	24.3	1.89	8.7	181	1,390
10/1/2019	Assessment	0.609	6.90	33.2	2.09	8.3	250	1,480
2/10/2020	Assessment	0.563	4.94	20.5	1.75	8.7	168	1,350
4/20/2020	Assessment	0.523	4.95	18.9	2.35	8.2	162	1,320
10/6/2020	Assessment	0.589	5.60	27.1	2.10	8.2	214	1,460

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1601
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.18	9.18	238	< 0.004 U	< 0.005 U	0.221	0.112	1.204	1.86	0.070	0.095	< 0.05 U	25.7	0.04 J	0.02 J
12/12/2017	Background	0.19	8.39	306	0.007 J	0.009 J	0.281	0.149	2.077	1.82	0.153	0.092	0.08 J	21.9	0.06 J	< 0.01 U
2/13/2018	Background	0.11	7.06	280	0.007 J	< 0.005 U	0.155	0.091	1.01	2.13	0.125	0.098	< 0.05 U	12.0	0.05 J	0.04 J
4/11/2018	Background	0.12	14.9	293	0.007 J	< 0.005 U	0.544	0.092	0.862	2.10	0.096	0.110	0.05 J	6.60	0.07 J	0.01 J
6/7/2018	Background	0.16	17.0	262	0.005 J	0.006 J	0.279	0.062	1.146	2.22	0.072	0.118	< 0.05 U	3.77	< 0.03 U	0.01 J
8/20/2018	Background	0.25	25.8	296	0.005 J	< 0.005 U	0.402	0.099	0.711	2.10	0.047	0.108	< 0.05 U	3.79	0.06 J	0.01 J
10/17/2018	Background	0.20	24.7	222	< 0.02 U	< 0.01 U	0.217	0.074	3.229	2.20	0.03 J	0.098	< 0.05 U	3.00	0.04 J	< 0.1 U
12/6/2018	Background	0.15	17.8	191	< 0.02 U	< 0.01 U	0.235	0.061	0.871	2.22	0.06 J	0.092	< 0.05 U	3.34	< 0.03 U	< 0.1 U
2/7/2019	Detection	0.17	17.8	176	< 0.02 U	0.01 J	0.292	0.072	0.157	2.32	0.08 J	0.099	< 0.05 U	2.85	< 0.03 U	< 0.1 U
4/8/2019	Assessment	0.15	21.7	184	< 0.02 U	0.02 J	0.258	0.072	0.337	2.18	0.07 J	0.111	0.05 J	1 J	0.04 J	< 0.1 U
5/28/2019	Assessment	0.11	18.4	179	< 0.02 U	< 0.01 U	0.288	0.064	0.939	1.89	0.02 J	0.090	0.1 J	1 J	< 0.03 U	< 0.1 U
10/1/2019	Assessment	0.11	21.1	239	< 0.02 U	< 0.01 U	0.291	0.088	0.481	2.09	< 0.05 U	0.108	< 0.2 U	1 J	0.05 J	< 0.1 U
2/10/2020	Assessment	0.07 J	10.1	156	< 0.02 U	< 0.01 U	0.231	0.073	2.076	1.75	< 0.05 U	0.0901	< 0.2 U	1 J	0.04 J	< 0.1 U
4/20/2020	Assessment	0.09 J	11.5	152	< 0.02 U	< 0.01 U	0.242	0.093	2.257	2.35	0.05 J	0.0904	< 0.2 U	1 J	0.06 J	< 0.1 U
10/6/2020	Assessment	0.06 J	11.4	172	< 0.02 U	< 0.01 U	0.2 J	0.080	0.618	2.10	0.1 J	0.0939	< 0.2 U	2.10	0.06 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1602
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.654	3.09	4.2	1.45	8.0	32.8	525
12/12/2017	Background	0.584	2.64	4.2	1.57	8.7	29.2	516
2/13/2018	Background	0.621	2.93	4.9	1.61	8.5	32.2	528
4/11/2018	Background	0.614	2.78	5.6	1.63	8.7	32.4	500
6/7/2018	Background	0.672	2.74	5.2	1.64	8.6	29.1	525
8/20/2018	Background	0.547	2.84	6.5	1.57	8.5	37.5	567
10/15/2018	Background	0.664	2.94	5.6	1.61	8.6	29.0	544
12/6/2018	Background	0.637	2.78	3.8	1.64	8.7	16.7	500
2/7/2019	Detection	0.590	3.72	4.4	1.69	8.7	20.5	521
4/8/2019	Assessment	0.620	4.00	5.5	1.56	8.6	25.0	571
5/28/2019	Assessment	0.579	3.39	4.4	1.66	8.8	20.4	517
10/1/2019	Assessment	0.640	4.62	5.7	1.54	8.6	29.5	530
2/10/2020	Assessment	0.617	3.07	3.7	1.56	9.2	15.7	504
4/20/2020	Assessment	0.605	3.83	3.9	1.70	8.6	17.4	510
10/6/2020	Assessment	0.633	3.78	5.3	1.57	8.5	24.5	527

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1602
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.22	2.69	104	0.01 J	< 0.005 U	0.472	0.151	0.6	1.45	0.185	0.051	< 0.05 U	9.80	0.04 J	0.02 J
12/12/2017	Background	0.12	2.15	111	0.01 J	< 0.005 U	0.291	0.100	0.6097	1.57	0.114	0.043	< 0.05 U	7.77	< 0.03 U	< 0.01 U
2/13/2018	Background	0.07	3.54	111	0.008 J	< 0.005 U	0.153	0.060	0.748	1.61	0.093	0.043	< 0.05 U	8.70	< 0.03 U	0.03 J
4/11/2018	Background	0.07	2.90	109	0.006 J	< 0.005 U	0.268	0.047	0.18727	1.63	0.140	0.040	< 0.05 U	6.41	< 0.03 U	< 0.01 U
6/7/2018	Background	0.07	2.16	109	0.007 J	< 0.005 U	0.262	0.041	0.8588	1.64	0.062	0.045	< 0.05 U	3.99	< 0.03 U	< 0.01 U
8/20/2018	Background	0.13	3.69	114	< 0.004 U	0.03	0.245	0.042	0.4565	1.57	0.126	0.034	< 0.05 U	4.84	< 0.03 U	0.01 J
10/15/2018	Background	0.06 J	2.95	101	< 0.02 U	< 0.01 U	0.251	0.03 J	0.2328	1.61	0.06 J	0.032	< 0.05 U	3.27	< 0.03 U	< 0.1 U
12/6/2018	Background	0.05 J	1.49	106	< 0.02 U	< 0.01 U	0.246	0.04 J	1.247	1.64	0.05 J	0.048	< 0.05 U	2.87	< 0.03 U	< 0.1 U
2/7/2019	Detection	0.08 J	1.88	106	< 0.02 U	< 0.01 U	0.231	0.04 J	0.2875	1.69	0.04 J	0.045	< 0.05 U	4.66	0.04 J	< 0.1 U
4/8/2019	Assessment	0.09 J	2.02	103	< 0.02 U	< 0.01 U	0.2 J	0.03 J	0.135	1.56	0.05 J	0.043	< 0.05 U	4.76	< 0.03 U	< 0.1 U
5/28/2019	Assessment	0.07 J	1.67	106	< 0.02 U	< 0.01 U	0.2 J	0.02 J	0.0613	1.66	0.03 J	0.036	0.1 J	3.70	< 0.03 U	< 0.1 U
10/1/2019	Assessment	0.09 J	1.92	109	< 0.02 U	< 0.01 U	0.2 J	0.02 J	0.701	1.54	< 0.05 U	0.0419	< 0.2 U	4.21	< 0.03 U	< 0.1 U
2/10/2020	Assessment	0.04 J	1.52	99.6	< 0.02 U	< 0.01 U	0.2 J	0.060	1.37	1.56	< 0.05 U	0.0386	< 0.2 U	2 J	< 0.03 U	< 0.1 U
4/20/2020	Assessment	0.05 J	1.21	102	< 0.02 U	< 0.01 U	0.1 J	0.02 J	0.673	1.70	< 0.05 U	0.0382	< 0.2 U	2.52	0.06 J	< 0.1 U
10/6/2020	Assessment	0.23	2.03	107	< 0.02 U	< 0.01 U	0.329	0.04 J	0.6456	1.57	0.08 J	0.0373	< 0.2 U	2.41	0.05 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1603
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.202	23.3	182	0.17	7.3	45.1	678
12/11/2017	Background	0.193	22.1	121	0.1 J	7.0	47.3	577
2/14/2018	Background	0.199	22.8	58.3	0.11	6.7	23.0	378
4/12/2018	Background	0.379	24.8	168	0.19	7.8	28.3	599
6/12/2018	Background	0.285	22.8	59.0	0.13	7.6	23.0	408
8/22/2018	Background	0.525	24.4	72.6	0.14	7.8	23.2	448
10/16/2018	Background	0.339	21.6	94.7	0.14	7.8	23.4	472
12/12/2018	Background	0.219	20.6	47.4	0.11	7.0	11.5	339
2/12/2019	Detection	0.177	19.8	59.5	0.11	6.8	8.1	374
4/10/2019	Assessment	0.211	21.7	69.5	0.10	7.2	16.2	434
5/30/2019	Assessment	0.197	20.0	77.0	0.13	7.7	6.2	401
10/2/2019	Assessment	0.313	26.7	124	0.10	7.7	8.7	480
2/11/2020	Assessment	0.362	26.6	162	0.12	8.0	1.9	515
4/21/2020	Assessment	0.256	24.6	128	0.10	6.8	2.3	528
10/7/2020	Assessment	0.300	25.7	171	0.15	7.7	0.6	624

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1603
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.04 J	1.82	2,160	< 0.004 U	< 0.005 U	0.214	0.691	3.233	0.17	0.038	0.054	< 0.05 U	4.71	0.1	0.02 J
12/11/2017	Background	0.05 J	1.70	1,950	0.01 J	< 0.005 U	0.190	0.541	0.901	0.1 J	0.021	0.048	0.06 J	2.55	0.07 J	0.01 J
2/14/2018	Background	0.04 J	1.68	2,070	0.01 J	< 0.005 U	0.157	0.451	0.6982	0.11	0.008 J	0.048	< 0.05 U	2.12	0.1	0.01 J
4/12/2018	Background	0.04 J	1.98	2,250	< 0.004 U	< 0.005 U	0.187	0.616	1.091	0.19	0.01 J	0.093	< 0.05 U	1.79	0.04 J	< 0.01 U
6/12/2018	Background	0.06	2.20	2,140	0.008 J	< 0.005 U	0.231	0.795	0.888	0.13	0.009 J	0.073	< 0.05 U	1.24	0.06 J	0.01 J
8/22/2018	Background	0.07	2.98	2,280	< 0.004 U	< 0.005 U	0.324	0.776	1.103	0.14	0.02 J	0.095	< 0.05 U	1.51	0.05 J	0.01 J
10/16/2018	Background	< 0.02 U	2.89	1,980	< 0.02 U	< 0.01 U	0.226	0.684	0.383	0.14	< 0.02 U	0.064	< 0.05 U	1 J	0.08 J	< 0.1 U
12/12/2018	Background	< 0.02 U	1.75	1,780	< 0.02 U	< 0.01 U	0.237	0.511	0.632	0.11	< 0.02 U	0.042	< 0.05 U	0.6 J	0.1 J	< 0.1 U
2/12/2019	Detection	0.02 J	1.63	1,860	< 0.02 U	< 0.01 U	0.222	0.486	0.3849	0.11	< 0.02 U	0.049	< 0.05 U	0.6 J	0.08 J	< 0.1 U
4/10/2019	Assessment	0.02 J	2.43	2,000	< 0.02 U	< 0.01 U	0.2 J	0.477	1.643	0.10	< 0.02 U	0.052	< 0.05 U	0.5 J	0.09 J	< 0.1 U
5/30/2019	Assessment	< 0.02 U	2.44	2,100	< 0.02 U	< 0.01 U	0.233	0.432	1.05	0.13	< 0.02 U	0.055	< 0.05 U	0.5 J	0.09 J	< 0.1 U
10/2/2019	Assessment	< 0.02 U	2.84	2,380	< 0.02 U	< 0.01 U	0.208	0.318	1.399	0.10	< 0.05 U	0.0767	< 0.2 U	0.6 J	0.08 J	< 0.1 U
2/11/2020	Assessment	0.03 J	2.32	2,840	< 0.02 U	< 0.01 U	0.2 J	0.172	2.02	0.12	< 0.05 U	0.0873	< 0.2 U	0.5 J	< 0.03 U	< 0.1 U
4/21/2020	Assessment	0.03 J	2.00	2,570	< 0.02 U	< 0.01 U	0.234	0.282	1.013	0.10	< 0.05 U	0.0661	< 0.2 U	0.9 J	0.08 J	< 0.1 U
10/7/2020	Assessment	0.06 J	2.09	2,770	< 0.02 U	< 0.01 U	0.08 J	0.189	0.5813	0.15	< 0.05 U	0.0716	< 0.2 U	0.4 J	0.04 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1604
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.428	27.7	29.9	0.27	6.9	8.2	404
12/11/2017	Background	0.476	29.3	22.5	0.22	6.7	6.3	395
2/14/2018	Background	0.396	26.3	22.6	0.23	7.1	6.7	378
4/12/2018	Background	0.399	27.2	22.5	0.27	7.2	5.6	410
6/12/2018	Background	0.406	26.2	21.0	0.25	7.1	4.2	374
8/22/2018	Background	0.471	27.3	20.3	0.26	7.1	4.1	390
10/16/2018	Background	0.444	27.2	17.8	0.22	7.1	3.4	390
12/12/2018	Background	0.468	28.9	19.4	0.22	7.1	2.8	375
2/12/2019	Detection	0.350	28.0	20.4	0.21	7.2	1.7	386
4/10/2019	Assessment	0.384	28.5	21.1	0.21	7.2	1.4	399
5/30/2019	Assessment	0.348	26.0	19.0	0.26	7.3	1.9	384
10/2/2019	Assessment	0.413	30.9	24.3	0.20	7.1	2.4	407
2/11/2020	Assessment	0.404	27.8	21.9	0.24	7.3	1.3	393
4/21/2020	Assessment	0.392	29.3	24.7	0.25	6.5	0.8	401
10/7/2020	Assessment	0.400	27.3	17.4	0.34	7.0	0.5	384

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1604
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.05	1.64	3,330	< 0.004 U	< 0.005 U	0.331	0.585	2.503	0.27	0.060	0.078	< 0.05 U	1.57	0.04 J	0.01 J
12/11/2017	Background	0.04 J	1.39	3,160	< 0.004 U	< 0.005 U	0.113	0.347	0.46499	0.22	0.02 J	0.090	0.06 J	0.83	< 0.03 U	0.01 J
2/14/2018	Background	0.05 J	1.61	3,320	< 0.004 U	< 0.005 U	0.116	0.487	1.265	0.23	0.01 J	0.080	< 0.05 U	0.92	0.05 J	< 0.01 U
4/12/2018	Background	0.18	3.10	2,880	0.007 J	< 0.005 U	0.255	0.427	1.117	0.27	0.068	0.078	< 0.05 U	0.50	0.07 J	< 0.01 U
6/12/2018	Background	0.08	1.58	3,210	0.005 J	< 0.005 U	0.248	0.687	1.762	0.25	0.047	0.087	< 0.05 U	0.47	0.05 J	0.01 J
8/22/2018	Background	0.07	1.71	3,260	< 0.004 U	< 0.005 U	0.244	1.03	1.185	0.26	0.01 J	0.085	< 0.05 U	0.54	0.05 J	0.02 J
10/16/2018	Background	< 0.02 U	1.89	3,040	< 0.02 U	< 0.01 U	0.207	1.12	0.776	0.22	< 0.02 U	0.080	< 0.05 U	0.6 J	0.06 J	< 0.1 U
12/12/2018	Background	0.04 J	1.36	3,150	< 0.02 U	< 0.01 U	0.2 J	0.634	1.019	0.22	0.02 J	0.077	< 0.05 U	0.5 J	0.03 J	< 0.1 U
2/12/2019	Detection	< 0.02 U	1.50	3,010	< 0.02 U	< 0.01 U	0.2 J	0.590	0.6812	0.21	< 0.02 U	0.076	< 0.05 U	< 0.4 U	< 0.03 U	< 0.1 U
4/10/2019	Assessment	0.03 J	2.26	3,280	< 0.02 U	< 0.01 U	0.1 J	0.701	1.561	0.21	< 0.02 U	0.083	< 0.05 U	0.4 J	0.05 J	< 0.1 U
5/30/2019	Assessment	0.02 J	2.44	3,280	< 0.02 U	< 0.01 U	0.262	0.766	0.653	0.26	< 0.02 U	0.077	< 0.05 U	0.4 J	0.05 J	< 0.1 U
10/2/2019	Assessment	< 0.02 U	2.98	3,320	< 0.02 U	< 0.01 U	0.213	0.672	1.521	0.20	< 0.05 U	0.0887	< 0.2 U	< 0.4 U	0.05 J	< 0.1 U
2/11/2020	Assessment	0.05 J	2.40	3,200	< 0.02 U	< 0.01 U	0.2 J	0.574	1.596	0.24	< 0.05 U	0.0636	< 0.2 U	< 0.4 U	< 0.03 U	< 0.1 U
4/21/2020	Assessment	0.03 J	2.03	3,470	< 0.02 U	< 0.01 U	0.1 J	0.580	2.091	0.25	< 0.05 U	0.0759	< 0.2 U	0.9 J	0.03 J	< 0.1 U
10/7/2020	Assessment	0.42	2.99	2,940	< 0.02 U	< 0.01 U	0.286	0.463	0.6107	0.34	< 0.05 U	0.0661	< 0.2 U	2 J	< 0.03 U	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1605
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.540	44.2	184	0.34	7.4	97.8	808
12/12/2017	Background	0.522	44.0	342	0.32	7.7	91.1	807
2/15/2018	Background	0.589	50.8	180	0.35	7.8	101	793
4/11/2018	Background	0.543	48.1	184	0.40	7.8	105	1,700
6/12/2018	Background	0.569	48.2	184	0.40	7.7	109	842
8/22/2018	Background	0.699	48.9	186	0.41	7.7	104	857
10/16/2018	Background	0.586	47.9	181	0.37	7.8	85.2	838
12/11/2018	Background	0.589	46.9	177	0.37	7.9	70.5	798
2/12/2019	Detection	0.582	45.1	174	0.35	7.9	61.8	808
4/10/2019	Assessment	0.583	42.9	173	0.33	7.9	46.5	777
5/30/2019	Assessment	0.523	39.5	180	0.39	7.9	47.4	772
10/2/2019	Assessment	0.613	47.6	179	0.31	7.8	35.1	768
2/11/2020	Assessment	0.571	38.7	160	0.36	8.0	11.2	699
4/21/2020	Assessment	0.535	42.3	163	0.33	7.0	5.0	678
10/7/2020	Assessment	0.545	43.4	154	0.38	7.6	< 0.06 U	682

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1605
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.28	5.81	1,670	< 0.004 U	< 0.005 U	0.163	0.403	2.122	0.34	0.029	0.191	< 0.05 U	8.54	0.05 J	< 0.01 U
12/12/2017	Background	0.21	7.25	1,570	0.005 J	< 0.005 U	0.158	0.354	2.159	0.32	0.026	0.183	< 0.05 U	7.42	0.08 J	0.01 J
2/15/2018	Background	0.10	4.59	1,560	< 0.004 U	< 0.005 U	0.136	0.306	1.134	0.35	0.051	0.220	< 0.05 U	6.62	0.07 J	0.02 J
4/11/2018	Background	0.07	4.58	1,250	< 0.004 U	< 0.005 U	0.219	0.316	1.24	0.40	0.036	0.196	< 0.05 U	4.35	0.05 J	< 0.01 U
6/12/2018	Background	0.14	4.50	1,290	0.004 J	< 0.005 U	0.230	0.357	1.132	0.40	0.085	0.207	< 0.05 U	4.19	< 0.03 U	0.01 J
8/22/2018	Background	0.11	3.35	1,330	0.01 J	< 0.005 U	0.291	0.407	0.349	0.41	0.040	0.206	< 0.05 U	3.38	0.05 J	0.02 J
10/16/2018	Background	0.04 J	3.11	1,130	< 0.02 U	< 0.01 U	0.215	0.321	0.641	0.37	< 0.02 U	0.198	< 0.05 U	2.78	< 0.03 U	< 0.1 U
12/11/2018	Background	0.04 J	3.83	1,170	< 0.02 U	< 0.01 U	0.2 J	0.309	2.717	0.37	< 0.02 U	0.199	< 0.05 U	2.65	< 0.03 U	< 0.1 U
2/12/2019	Detection	0.07 J	5.22	1,110	< 0.02 U	0.02 J	0.246	0.264	0.644	0.35	0.05 J	0.206	< 0.05 U	2.10	0.04 J	< 0.1 U
4/10/2019	Assessment	0.06 J	4.11	1,100	< 0.02 U	0.01 J	0.288	0.200	1.137	0.33	0.05 J	0.199	< 0.05 U	2.34	0.05 J	< 0.1 U
5/30/2019	Assessment	0.04 J	3.81	1,050	< 0.02 U	< 0.01 U	0.221	0.176	1.36	0.39	< 0.02 U	0.178	< 0.05 U	1 J	< 0.03 U	< 0.1 U
10/2/2019	Assessment	0.03 J	2.75	1,160	< 0.02 U	< 0.01 U	0.2 J	0.125	0.868	0.31	< 0.05 U	0.204	< 0.2 U	1 J	0.07 J	< 0.1 U
2/11/2020	Assessment	0.09 J	3.14	1,390	< 0.02 U	< 0.01 U	0.455	0.068	0.6629	0.36	< 0.05 U	0.174	< 0.2 U	0.7 J	< 0.03 U	< 0.1 U
4/21/2020	Assessment	0.06 J	1.95	1,730	< 0.02 U	< 0.01 U	0.335	0.115	1.388	0.33	0.06 J	0.191	< 0.2 U	2.68	< 0.03 U	< 0.1 U
10/7/2020	Assessment	0.03 J	2.07	1,890	< 0.02 U	< 0.01 U	0.300	0.060	6.63	0.38	< 0.05 U	0.173	< 0.2 U	0.7 J	< 0.03 U	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1606
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.078	50.9	14.3	0.20	6.8	57.9	374
12/12/2017	Background	0.194	55.3	14.4	0.17	7.1	66.8	348
2/14/2018	Background	0.175	56.8	14.9	0.18	7.1	68.3	336
4/10/2018	Background	0.148	44.8	12.9	0.26	7.2	42.4	302
6/11/2018	Background	0.144	55.0	14.0	0.27	7.0	45.4	316
8/21/2018	Background	0.168	64.4	15.7	0.23	7.0	54.9	377
10/15/2018	Background	0.136	60.0	14.3	0.24	7.1	47.8	344
12/11/2018	Background	0.126	58.6	13.9	0.25	7.2	42.1	329
2/12/2019	Detection	0.110	56.8	14.1	0.24	7.2	39.7	341
4/9/2019	Assessment	0.07 J	62.2	13.0	0.16	7.2	32.5	352
5/29/2019	Assessment	0.05 J	55.9	11.5	0.16	7.3	27.6	336
10/1/2019	Assessment	0.084	58.9	13.6	0.19	7.0	32.4	350
2/10/2020	Assessment	0.084	54.5	11.8	0.19	7.3	35.4	321
4/20/2020	Assessment	0.04 J	59.2	7.0	0.12	6.6	25.4	287
10/7/2020	Assessment	0.067	59.3	12.9	0.18	7.1	35.7	321

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1606
Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.02 J	7.03	117	< 0.004 U	0.01 J	0.139	6.00	2.331	0.20	0.628	0.089	< 0.05 U	84.2	0.06 J	0.04 J
12/12/2017	Background	0.02 J	6.77	117	0.005 J	0.01 J	0.216	6.33	0.7252	0.17	0.573	0.086	0.06 J	82.4	0.1 J	0.04 J
2/14/2018	Background	0.03 J	6.76	116	0.006 J	< 0.005 U	0.140	5.66	1.459	0.18	0.388	0.067	< 0.05 U	65.1	0.1 J	0.04 J
4/10/2018	Background	0.02 J	6.72	104	0.007 J	0.01 J	0.225	5.53	1.156	0.26	0.549	0.095	< 0.05 U	89.6	0.1	0.04 J
6/11/2018	Background	0.04 J	6.89	114	0.006 J	< 0.005 U	0.205	4.98	1.154	0.27	0.451	0.099	< 0.05 U	91.5	0.08 J	0.05
8/21/2018	Background	0.04 J	7.19	124	0.006 J	0.006 J	0.218	6.13	1.269	0.23	0.515	0.081	< 0.05 U	66.1	0.08 J	0.05
10/15/2018	Background	0.03 J	7.13	116	< 0.02 U	< 0.01 U	0.211	5.34	1.148	0.24	0.391	0.087	< 0.05 U	71.9	0.07 J	< 0.1 U
12/11/2018	Background	< 0.02 U	7.71	117	< 0.02 U	< 0.01 U	0.2 J	5.58	2.743	0.25	0.445	0.091	< 0.05 U	80.7	0.05 J	< 0.1 U
2/12/2019	Detection	< 0.02 U	7.90	117	< 0.02 U	< 0.01 U	0.2 J	5.79	1.189	0.24	0.343	0.100	< 0.05 U	87.4	0.04 J	< 0.1 U
4/9/2019	Assessment	< 0.02 U	11.0	107	< 0.02 U	< 0.01 U	0.1 J	4.99	1.491	0.16	0.225	0.044	< 0.05 U	44.8	0.08 J	< 0.1 U
5/29/2019	Assessment	< 0.02 U	11.6	106	< 0.02 U	< 0.01 U	0.2 J	4.86	1.4097	0.16	0.255	0.038	< 0.05 U	39.1	< 0.03 U	< 0.1 U
10/1/2019	Assessment	< 0.02 U	8.33	120	< 0.02 U	< 0.01 U	0.2 J	4.66	0.962	0.19	0.358	0.0717	< 0.2 U	57.8	0.05 J	< 0.1 U
2/10/2020	Assessment	0.02 J	8.09	105	< 0.02 U	0.02 J	0.380	5.03	2.82	0.19	0.713	0.0645	< 0.2 U	61.4	0.1 J	< 0.1 U
4/20/2020	Assessment	0.03 J	2.80	83.1	< 0.02 U	0.02 J	0.2 J	2.15	2.82	0.12	0.253	0.0267	< 0.2 U	29.3	0.2	0.1 J
10/7/2020	Assessment	0.04 J	15.0	106	< 0.02 U	0.02 J	0.2 J	3.52	2.816	0.18	0.731	0.0220	< 0.2 U	34.6	0.1 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1607
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.139	54.9	16.7	0.25	7.6	197	468
12/12/2017	Background	0.212	50.1	16.3	0.22	7.4	206	417
2/14/2018	Background	0.121	48.7	10.7	0.20	7.9	149	284
4/11/2018	Background	0.143	49.1	11.0	0.22	8.0	153	306
6/11/2018	Background	0.143	49.5	11.1	0.23	7.8	156	278
8/21/2018	Background	0.151	46.4	12.0	0.26	8.0	162	315
10/15/2018	Background	0.122	45.8	11.7	0.26	8.1	159	302
12/11/2018	Background	0.111	44.8	10.0	0.25	7.7	150	280
2/12/2019	Detection	0.1 J	46.3	9.5	0.23	7.9	151	298
4/9/2019	Assessment	0.134	47.2	8.2	0.20	8.0	130	296
5/29/2019	Assessment	0.1 J	44.5	8.4	0.23	7.9	146	293
10/2/2019	Assessment	0.112	49.4	8.5	0.18	7.8	147	290
2/11/2020	Assessment	0.106	47.3	6.6	0.21	8.1	124	279
4/21/2020	Assessment	0.108	48.5	6.7	0.19	7.0	125	275
10/6/2020	Assessment	0.111	42.7	7.4	0.24	7.7	136	270

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1607
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.05	4.38	141	< 0.004 U	0.02 J	0.273	4.06	2.733	0.25	0.228	0.110	< 0.05 U	89.7	0.09 J	< 0.01 U
12/12/2017	Background	0.08	5.28	92.5	0.005 J	0.12	0.194	8.94	1.062	0.22	0.614	0.119	0.08 J	126	0.09 J	0.01 J
2/14/2018	Background	0.05 J	0.96	71.5	< 0.004 U	0.18	0.100	11.2	0.743	0.20	0.727	0.110	< 0.05 U	160	0.1	0.01 J
4/11/2018	Background	0.04 J	1.05	71.1	< 0.004 U	0.17	0.206	11.4	0.436	0.22	0.585	0.125	< 0.05 U	144	0.1	0.03 J
6/11/2018	Background	0.05	0.98	74.7	< 0.004 U	0.09	0.208	11.3	0.975	0.23	0.524	0.133	< 0.05 U	153	0.2	0.05 J
8/21/2018	Background	0.06	1.29	75.7	< 0.004 U	0.11	0.216	10.1	0.511	0.26	0.525	0.129	< 0.05 U	165	0.2	0.03 J
10/15/2018	Background	0.09 J	1.46	71.9	< 0.02 U	0.11	0.224	10.9	0.999	0.26	0.524	0.132	< 0.05 U	164	0.04 J	< 0.1 U
12/11/2018	Background	0.03 J	1.01	70.4	< 0.02 U	0.25	0.2 J	12.1	0.66	0.25	0.701	0.126	< 0.05 U	168	0.1 J	< 0.1 U
2/12/2019	Detection	0.04 J	0.86	73.1	< 0.02 U	0.18	0.2 J	12.7	0.885	0.23	0.586	0.139	< 0.05 U	175	0.2 J	< 0.1 U
4/9/2019	Assessment	0.03 J	1.59	75.3	< 0.02 U	0.11	0.2 J	8.87	0.701	0.20	0.423	0.127	< 0.05 U	138	0.2 J	< 0.1 U
5/29/2019	Assessment	0.03 J	1.08	74.2	< 0.02 U	0.18	0.212	10.2	0.744	0.23	0.366	0.123	< 0.05 U	154	0.2 J	< 0.1 U
10/2/2019	Assessment	< 0.02 U	1.64	72.4	< 0.02 U	0.18	0.2 J	6.74	1.028	0.18	0.228	0.132	< 0.2 U	148	0.1 J	< 0.1 U
2/11/2020	Assessment	0.03 J	0.83	69.8	< 0.02 U	0.17	0.1 J	9.61	1.659	0.21	0.684	0.112	< 0.2 U	131	0.4	< 0.1 U
4/21/2020	Assessment	0.04 J	0.96	72.4	< 0.02 U	0.17	0.209	10.1	0.978	0.19	0.667	0.120	< 0.2 U	134	0.7	0.1 J
10/6/2020	Assessment	0.08 J	1.27	68.2	< 0.02 U	0.10	0.05 J	7.82	0.315	0.24	0.323	0.125	< 0.2 U	134	0.2	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1608
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.359	1.92	7.6	0.45	8.1	179	484
12/11/2017	Background	0.375	1.31	7.3	0.40	8.0	176	468
2/13/2018	Background	0.349	1.09	8.7	0.45	8.7	182	466
4/10/2018	Background	0.334	0.779	8.0	0.48	8.8	178	466
6/7/2018	Background	0.389	0.708	7.2	0.44	8.7	171	437
8/20/2018	Background	0.315	1.31	7.4	0.43	8.7	173	441
10/17/2018	Background	0.344	1.37	6.8	0.43	0.1	167	439
12/6/2018	Background	0.365	1.24	6.1	0.42	8.7	166	423
2/7/2019	Detection	0.332	1.35	6.2	0.42	8.6	171	445
4/8/2019	Assessment	0.352	1.32	6.7	0.39	8.7	162	454
5/28/2019	Assessment	0.310	1.11	5.4	0.44	8.7	174	443
10/1/2019	Assessment	0.351	1.19	6.6	0.39	8.7	176	457
2/10/2020	Assessment	0.353	0.748	5.2	0.41	9.2	164	422
4/20/2020	Assessment	0.344	0.959	4.6	0.42	8.2	167	418
10/6/2020	Assessment	0.360	1.01	6.6	0.40	8.5	182	445

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1608
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.06	1.69	42.7	0.042	< 0.005 U	0.956	0.442	0.661	0.45	0.405	0.027	< 0.05 U	9.04	0.1	0.02 J
12/11/2017	Background	0.06	1.96	42.9	0.066	< 0.005 U	1.26	0.425	0.498	0.40	0.526	0.032	0.07 J	7.35	0.1	0.02 J
2/13/2018	Background	0.05 J	2.00	43.8	0.062	< 0.005 U	1.08	0.401	0.939	0.45	0.656	0.024	< 0.05 U	6.43	0.09 J	0.03 J
4/10/2018	Background	0.05 J	1.86	41.9	0.056	< 0.005 U	1.11	0.372	0.484	0.48	0.675	0.023	< 0.05 U	3.52	0.1	0.02 J
6/7/2018	Background	0.06	2.99	44.3	0.041	0.006 J	0.912	0.330	0.894	0.44	0.721	0.028	< 0.05 U	2.49	0.09 J	0.02 J
8/20/2018	Background	0.06	1.88	38.4	0.031	0.02 J	0.938	0.284	2.988	0.43	0.438	0.018	< 0.05 U	3.20	0.07 J	0.02 J
10/17/2018	Background	0.03 J	1.70	34.2	0.03 J	< 0.01 U	0.647	0.217	3.565	0.43	0.273	0.02 J	< 0.05 U	2.89	0.06 J	< 0.1 U
12/6/2018	Background	0.04 J	1.36	33.1	0.03 J	< 0.01 U	0.639	0.229	0.518	0.42	0.284	0.01 J	< 0.05 U	2.67	0.04 J	< 0.1 U
2/7/2019	Detection	0.04 J	1.64	35.3	0.02 J	< 0.01 U	0.633	0.233	0.1256	0.42	0.256	0.03 J	< 0.05 U	2.66	0.07 J	< 0.1 U
4/8/2019	Assessment	0.03 J	1.46	32.9	< 0.02 U	< 0.01 U	0.696	0.227	0.4948	0.39	0.255	0.02 J	< 0.05 U	2.32	0.06 J	< 0.1 U
5/28/2019	Assessment	0.08 J	1.35	34.4	0.03 J	0.02 J	0.722	0.262	0.163	0.44	0.418	< 0.009 U	0.1 J	2.11	< 0.03 U	< 0.1 U
10/1/2019	Assessment	0.03 J	1.46	35.0	< 0.02 U	< 0.01 U	0.359	0.159	0.462	0.39	0.214	0.0211	< 0.2 U	2 J	0.04 J	< 0.1 U
2/10/2020	Assessment	0.03 J	1.22	29.8	< 0.02 U	< 0.01 U	0.618	0.280	0.594	0.41	0.250	0.0197	< 0.2 U	2 J	0.04 J	< 0.1 U
4/20/2020	Assessment	0.02 J	0.89	28.9	< 0.02 U	< 0.01 U	0.413	0.203	1.497	0.42	0.2 J	0.0185	< 0.2 U	1 J	0.05 J	< 0.1 U
10/6/2020	Assessment	0.02 J	1.25	32.0	< 0.02 U	< 0.01 U	0.302	0.200	0.79	0.40	0.1 J	0.0196	< 0.2 U	2 J	0.03 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1609
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.017	66.6	4.1	0.32	6.7	13.6	358
12/11/2017	Background	0.084	67.9	3.1	0.32	6.6	12.6	326
2/13/2018	Background	0.084	60.7	3.2	0.31	7.6	21.8	262
4/10/2018	Background	0.041	59.9	1.7	0.27	7.4	15.8	292
6/11/2018	Background	0.077	75.5	1.9	0.28	7.3	21.0	312
8/21/2018	Background	0.117	72.6	1.5	0.29	7.3	13.7	311
10/15/2018	Background	0.05 J	70.0	1.6	0.27	7.5	16.8	276
12/6/2018	Background	0.04 J	66.1	1.5	0.26	7.5	14.9	281
2/7/2019	Detection	< 0.02 U	72.3	1.3	0.21	7.4	13.7	305
4/8/2019	Assessment	< 0.02 U	82.5	1.2	0.20	7.5	13.6	323
5/28/2019	Assessment	< 0.02 U	74.8	1.3	0.25	7.6	17.4	322
10/1/2019	Assessment	< 0.02 U	69.0	1.3	0.25	7.4	13.2	282
2/10/2020	Assessment	< 0.02 U	65.6	1.1	0.22	7.8	12.9	287
4/20/2020	Assessment	< 0.02 U	66.0	1.1	0.21	7.0	12.4	276
10/6/2020	Assessment	< 0.02 U	70.1	1.4	0.23	7.3	17.3	271

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1609
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.06	0.97	476	< 0.004 U	< 0.005 U	0.126	0.338	3.258	0.32	0.142	< 0.0002 U	< 0.05 U	2.22	0.03 J	< 0.01 U
12/11/2017	Background	0.05	0.95	507	0.004 J	< 0.005 U	0.112	0.258	1.423	0.32	0.033	0.010	< 0.05 U	1.78	< 0.03 U	0.03 J
2/13/2018	Background	0.05 J	0.43	333	< 0.004 U	< 0.005 U	0.151	0.522	1.661	0.31	0.326	< 0.0002 U	< 0.05 U	1.55	0.1 J	0.03 J
4/10/2018	Background	0.03 J	0.18	359	< 0.004 U	0.02 J	0.164	0.168	1.544	0.27	0.426	0.0009 J	< 0.05 U	1.34	0.2	0.01 J
6/11/2018	Background	0.07	0.19	397	< 0.004 U	0.04	0.154	0.082	1.893	0.28	0.524	0.005	< 0.05 U	0.79	0.1	0.01 J
8/21/2018	Background	0.13	0.28	435	< 0.004 U	0.03	0.232	1.38	1.161	0.29	0.548	0.004	< 0.05 U	0.46	0.03 J	0.09
10/15/2018	Background	0.05 J	0.19	345	< 0.02 U	< 0.01 U	0.319	0.558	0.8423	0.27	0.506	< 0.009 U	< 0.05 U	0.6 J	< 0.03 U	< 0.1 U
12/6/2018	Background	0.02 J	0.14	356	< 0.02 U	0.01 J	0.2 J	0.114	1.794	0.26	0.350	0.01 J	< 0.05 U	0.6 J	0.1 J	< 0.1 U
2/7/2019	Detection	0.03 J	0.10	365	< 0.02 U	0.02 J	0.239	< 0.02 U	1.569	0.21	0.362	< 0.009 U	< 0.05 U	0.4 J	0.2 J	< 0.1 U
4/8/2019	Assessment	0.03 J	0.10	443	< 0.02 U	0.01 J	0.1 J	0.206	1.519	0.20	0.528	< 0.009 U	< 0.05 U	< 0.4 U	0.06 J	< 0.1 U
5/28/2019	Assessment	0.02 J	0.10	466	< 0.02 U	0.01 J	0.234	< 0.02 U	1.387	0.25	0.337	< 0.009 U	0.1 J	< 0.4 U	0.7	< 0.1 U
10/1/2019	Assessment	0.02 J	0.19	412	< 0.02 U	0.02 J	0.1 J	0.634	2.24	0.25	0.935	0.00107	< 0.2 U	< 0.4 U	< 0.03 U	< 0.1 U
2/10/2020	Assessment	< 0.02 U	0.13	355	< 0.02 U	0.01 J	0.1 J	0.226	2.79	0.22	1.25	0.000755	< 0.2 U	0.6 J	0.1 J	< 0.1 U
4/20/2020	Assessment	< 0.02 U	0.08 J	337	< 0.02 U	0.01 J	0.2 J	< 0.02 U	5.26	0.21	0.323	0.000559	< 0.2 U	< 0.4 U	0.2	< 0.1 U
10/6/2020	Assessment	0.03 J	0.1 J	424	< 0.02 U	0.01 J	0.203	0.212	1.938	0.23	0.324	0.000975	< 0.2 U	1 J	0.03 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1610
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.097	35.5	11.9	0.18	7.3	47.7	260
12/12/2017	Background	0.092	35.0	11.1	0.17	7.1	46.2	241
2/15/2018	Background	0.105	37.3	11.8	0.20	7.5	49.1	247
4/11/2018	Background	0.060	36.1	11.7	0.21	7.6	46.4	254
6/12/2018	Background	0.053	35.8	13.4	0.21	7.5	53.2	258
8/21/2018	Background	0.139	35.2	11.7	0.22	7.6	48.7	258
10/16/2018	Background	0.07 J	35.0	10.4	0.21	7.7	41.1	245
12/11/2018	Background	0.05 J	33.6	10.5	0.22	7.7	43.3	233
2/12/2019	Detection	0.03 J	35.4	10.8	0.21	7.7	41.2	257
4/9/2019	Assessment	0.05 J	38.5	10.9	0.17	7.7	41.6	263
5/29/2019	Assessment	0.04 J	35.6	10.5	0.18	7.8	44.1	263
10/1/2019	Assessment	0.04 J	37.8	10.7	0.18	7.5	40.8	258
2/11/2020	Assessment	0.03 J	36.8	10.5	0.19	7.8	36.4	245
4/20/2020	Assessment	0.04 J	39.2	10.6	0.20	6.9	37.7	254
10/7/2020	Assessment	0.068	14.2	10.1	0.35	8.3	47.1	229

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1610
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.22	1.67	212	< 0.004 U	0.03	0.167	9.90	0.839	0.18	12.6	0.141	< 0.05 U	139	0.4	0.03 J
12/12/2017	Background	0.07	1.18	227	0.004 J	0.01 J	0.174	12.1	1.132	0.17	15.2	0.146	0.06 J	152	0.3	0.01 J
2/15/2018	Background	0.05 J	1.56	203	0.007 J	< 0.005 U	0.159	11.7	0.688	0.20	11.1	0.180	< 0.05 U	161	0.2	0.02 J
4/11/2018	Background	0.09	1.37	193	0.004 J	0.03	0.192	10.2	0.192	0.21	15.0	0.171	< 0.05 U	135	0.4	0.02 J
6/12/2018	Background	0.08	1.24	202	0.004 J	< 0.005 U	0.210	10.6	1.788	0.21	8.48	0.188	< 0.05 U	132	0.3	0.02 J
8/21/2018	Background	0.06	1.08	200	< 0.004 U	< 0.005 U	0.248	10.1	1.039	0.22	3.61	0.206	< 0.05 U	172	0.1	0.02 J
10/16/2018	Background	< 0.02 U	1.28	203	< 0.02 U	< 0.01 U	0.262	8.25	0.938	0.21	4.33	0.207	< 0.05 U	160	0.1 J	< 0.1 U
12/11/2018	Background	0.03 J	1.69	200	< 0.02 U	< 0.01 U	0.208	8.97	1.759	0.22	7.18	0.219	< 0.05 U	182	0.2	< 0.1 U
2/12/2019	Detection	0.08 J	1.59	253	< 0.02 U	0.02 J	0.2 J	7.43	0.517	0.21	6.94	0.183	< 0.05 U	159	0.5	< 0.1 U
4/9/2019	Assessment	0.12	1.61	247	< 0.02 U	0.03 J	0.267	6.28	1.338	0.17	9.60	0.197	< 0.05 U	156	0.5	< 0.1 U
5/29/2019	Assessment	0.07 J	1.29	241	< 0.02 U	0.04 J	0.243	7.92	0.331	0.18	6.54	0.191	< 0.05 U	167	0.3	< 0.1 U
10/1/2019	Assessment	0.02 J	1.28	235	< 0.02 U	< 0.01 U	0.2 J	6.35	0.883	0.18	3.28	0.192	< 0.2 U	135	0.3	< 0.1 U
2/11/2020	Assessment	0.35	1.00	272	< 0.02 U	0.03 J	0.209	6.77	1.182	0.19	4.96	0.173	< 0.2 U	144	0.3	< 0.1 U
4/20/2020	Assessment	1.46	1.39	261	< 0.02 U	0.06	0.800	7.43	1.835	0.20	4.04	0.180	< 0.2 U	143	0.3	< 0.1 U
10/7/2020	Assessment	0.69	5.92	151	< 0.02 U	< 0.01 U	0.278	4.30	1.734	0.35	1.47	0.348	< 0.2 U	345	0.3	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1611
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.423	115	131	0.48	7.4	1,600	2,940
12/11/2017	Background	0.551	124	138	0.68	7.5	1,690	3,420
2/13/2018	Background	0.663	143	101	0.66	7.7	1,330	2,720
4/10/2018	Background	0.669	96.2	91.3	0.85	7.8	1,400	2,520
6/11/2018	Background	0.701	68.6	61.5	0.90	7.7	777	1,750
8/21/2018	Background	0.650	46.7	48.9	0.98	7.7	552	1,450
10/15/2018	Background	0.634	42.5	38.5	0.92	7.8	389	1,200
12/6/2018	Background	0.681	36.3	36.2	0.96	7.9	318	1,060
2/12/2019	Detection	0.559	31.9	31.3	0.98	7.8	259	989
4/9/2019	Assessment	0.622	32.8	26.9	0.92	7.9	222	939
5/29/2019	Assessment	0.536	27.7	24.2	0.99	8.0	201	852
10/1/2019	Assessment	0.617	28.2	21.7	1.06	7.8	166	771
2/11/2020	Assessment	0.586	25.8	17.9	1.00	8.0	139	697
4/20/2020	Assessment	0.569	26.0	17.0	1.07	7.1	125	662
10/6/2020	Assessment	0.556	24.0	16.0	1.02	7.7	98.1	622

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1611
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.33	7.16	91.8	< 0.004 U	0.01 J	0.656	0.311	1.295	0.48	1.05	0.109	< 0.05 U	38.0	0.09 J	< 0.01 U
12/11/2017	Background	0.18	11.5	63.7	0.01 J	< 0.01 U	0.555	0.080	0.278	0.68	0.04 J	0.130	0.08 J	6.76	0.1 J	0.04 J
2/13/2018	Background	0.54	36.5	53.3	0.01 J	< 0.005 U	0.836	0.131	0.748	0.66	0.146	0.161	< 0.05 U	2.19	0.1	0.11
4/10/2018	Background	0.50	39.5	51.0	0.009 J	< 0.005 U	0.864	0.122	0.257	0.85	0.142	0.130	< 0.05 U	2.54	0.1	< 0.01 U
6/11/2018	Background	0.23	27.5	57.2	0.008 J	< 0.005 U	0.640	0.092	0.766	0.90	0.169	0.110	< 0.05 U	2.10	0.09 J	< 0.01 U
8/21/2018	Background	0.15	20.1	60.6	0.007 J	< 0.005 U	0.572	0.076	0.36	0.98	0.144	0.090	< 0.05 U	1.85	0.08 J	0.04 J
10/15/2018	Background	0.10	19.2	63.3	< 0.02 U	< 0.01 U	0.454	0.062	0.467	0.92	0.133	0.079	< 0.05 U	2 J	0.05 J	< 0.1 U
12/6/2018	Background	0.06 J	16.4	68.8	< 0.02 U	< 0.01 U	0.355	0.055	0.384	0.96	0.120	0.080	< 0.05 U	2.41	0.04 J	< 0.1 U
2/12/2019	Detection	0.05 J	13.2	75.7	< 0.02 U	< 0.01 U	0.326	0.056	0.3448	0.98	0.109	0.071	< 0.05 U	2.52	0.04 J	< 0.1 U
4/9/2019	Assessment	0.05 J	11.9	80.8	< 0.02 U	< 0.01 U	0.415	0.062	0.512	0.92	0.09 J	0.087	< 0.05 U	2.36	0.05 J	< 0.1 U
5/29/2019	Assessment	0.05 J	9.20	85.3	< 0.02 U	< 0.01 U	0.343	0.03 J	0.457	0.99	< 0.02 U	0.073	< 0.05 U	2.12	0.05 J	< 0.1 U
10/1/2019	Assessment	0.03 J	9.46	100	< 0.02 U	< 0.01 U	0.295	0.055	0.524	1.06	0.08 J	0.0699	< 0.2 U	2.84	0.08 J	< 0.1 U
2/11/2020	Assessment	0.03 J	8.01	112	< 0.02 U	< 0.01 U	0.221	0.03 J	0.34769	1.00	0.06 J	0.0629	< 0.2 U	3.89	0.04 J	< 0.1 U
4/20/2020	Assessment	0.02 J	7.30	113	< 0.02 U	< 0.01 U	0.2 J	0.02 J	1.935	1.07	< 0.05 U	0.0646	< 0.2 U	2.08	0.04 J	< 0.1 U
10/6/2020	Assessment	0.04 J	6.69	130	< 0.02 U	< 0.01 U	0.293	0.03 J	0.763	1.02	0.07 J	0.0630	< 0.2 U	2.21	0.06 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1612
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
12/13/2017	Background	0.453	38.7	13.3	0.12	7.1	6.0	384
2/14/2018	Background	0.532	43.0	14.5	0.12	6.9	9.3	506
4/12/2018	Background	0.476	44.9	21.6	0.17	7.1	13.9	546
6/12/2018	Background	0.452	42.4	22.7	0.17	7.0	16.9	524
8/22/2018	Background	0.543	42.0	20.9	0.19	7.1	15.6	550
10/16/2018	Background	0.5 J	38.1	37.1	0.21	7.3	10.8	528
12/11/2018	Background	0.439	37.9	35.3	0.20	7.4	7.8	522
2/12/2019	Detection	0.393	36.4	32.8	0.19	7.3	5.4	537
4/10/2019	Assessment	0.527	41.0	27.5	0.18	7.4	4.6	551
5/30/2019	Assessment	0.355	34.9	32.8	0.22	7.4	3.3	537
10/2/2019	Assessment	0.423	45.9	30.7	0.14	7.1	1.9	533
2/11/2020	Assessment	0.367	40.1	33.3	0.17	7.3	1.2	520
4/21/2020	Assessment	0.381	54.4	9.9	0.08	6.2	0.2 J	495
10/7/2020	Assessment	0.399	50.7	20.0	0.16	6.8	< 0.06 U	526

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1612
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
12/13/2017	Background	0.30	3.86	2,020	0.045	< 0.005 U	0.437	0.274	2.942	0.12	0.331	0.109	0.06 J	3.60	0.1	0.01 J
2/14/2018	Background	0.08	2.61	2,560	0.01 J	< 0.005 U	0.190	0.149	1.358	0.12	0.083	0.121	< 0.05 U	1.59	0.06 J	0.03 J
4/12/2018	Background	0.11	2.26	2,170	0.005 J	< 0.005 U	0.196	0.115	2.209	0.17	0.040	0.128	< 0.05 U	1.13	0.03 J	< 0.01 U
6/12/2018	Background	0.07	1.82	2,170	0.006 J	< 0.005 U	0.206	0.094	1.58	0.17	0.038	0.132	< 0.05 U	0.83	0.04 J	0.01 J
8/22/2018	Background	0.05	1.56	2,090	< 0.004 U	< 0.005 U	0.251	0.124	2.76	0.19	0.025	0.136	< 0.05 U	0.67	0.03 J	0.01 J
10/16/2018	Background	0.02 J	1.17	1,640	< 0.02 U	< 0.01 U	0.2 J	0.242	1.051	0.21	0.02 J	< 0.09 U	< 0.05 U	0.8 J	0.04 J	< 0.1 U
12/11/2018	Background	0.03 J	0.92	1,880	< 0.02 U	< 0.01 U	0.2 J	0.304	3.009	0.20	< 0.02 U	0.134	< 0.05 U	0.7 J	< 0.03 U	< 0.1 U
2/12/2019	Detection	0.02 J	0.71	1,880	< 0.02 U	< 0.01 U	0.204	0.320	0.574	0.19	< 0.02 U	0.123	< 0.05 U	0.50 J	< 0.03 U	< 0.1 U
4/10/2019	Assessment	0.03 J	0.74	2,060	< 0.02 U	< 0.01 U	0.1 J	0.339	1.25	0.18	< 0.02 U	0.133	< 0.05 U	0.7 J	< 0.03 U	< 0.1 U
5/30/2019	Assessment	0.02 J	0.76	1,930	< 0.02 U	< 0.01 U	0.257	0.228	0.621	0.22	< 0.02 U	0.113	< 0.05 U	0.7 J	< 0.03 U	< 0.1 U
10/2/2019	Assessment	< 0.02 U	0.56	2,150	< 0.02 U	< 0.01 U	0.218	0.182	1.137	0.14	< 0.05 U	0.128	< 0.2 U	2.01	0.05 J	< 0.1 U
2/11/2020	Assessment	0.05 J	0.45	2,050	< 0.02 U	< 0.01 U	0.2 J	0.121	1.888	0.17	< 0.05 U	0.106	< 0.2 U	2 J	0.03 J	< 0.1 U
4/21/2020	Assessment	0.15	0.39	2,600	< 0.02 U	< 0.01 U	0.216	0.176	2.65	0.08	0.07 J	0.107	< 0.2 U	0.8 J	0.03 J	< 0.1 U
10/7/2020	Assessment	0.03 J	0.76	2,450	< 0.02 U	< 0.01 U	0.1 J	0.183	1.765	0.16	< 0.05 U	0.103	< 0.2 U	< 0.4 U	< 0.03 U	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1903D
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.302	196	4,170	< 0.4 U	7.0	< 2 U	7,060
11/9/2020	Assessment	0.270	231	4,780	0.4 J	8.0	< 0.8 U	8,000

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1903D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.22	8.73	15,000	< 0.04 U	< 0.02 U	0.2 J	0.471	7.24	< 0.4 U	0.1 J	0.425	< 0.2 U	13.7	0.1 J	< 0.2 U
11/9/2020	Assessment	< 0.1 U	6.47	24,700	< 0.1 U	< 0.05 U	< 0.2 U	< 0.1 U	8.28	0.4 J	< 0.2 U	0.459	< 0.2 U	20.9	< 0.2 U	< 0.5 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1903S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.350	95.4	1,190	0.11	6.3	< 0.06 U	2,320
11/9/2020	Assessment	0.383	80.0	937	0.1 J	7.0	< 0.2 U	2,020

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1903S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.06 J	2.99	9,280	0.03 J	< 0.01 U	0.362	0.208	4.55	0.11	0.713	0.194	< 0.2 U	1 J	0.06 J	< 0.1 U
11/9/2020	Assessment	0.13	1.76	7,420	< 0.02 U	< 0.01 U	0.1 J	0.120	3.71	0.1 J	< 0.05 U	0.169	< 0.2 U	0.9 J	< 0.03 U	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1904D
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.504	8.82	84.3	1.17	7.3	8.0	795
11/9/2020	Assessment	0.472	8.68	92.3	1.18	8.0	< 0.06 U	802

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1904D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.26	2.76	712	< 0.02 U	< 0.01 U	0.229	0.162	2.18	1.17	0.06 J	0.154	< 0.2 U	4.60	< 0.03 U	< 0.1 U
11/9/2020	Assessment	3.23	2.48	850	< 0.02 U	< 0.01 U	0.1 J	0.05 J	3.103	1.18	< 0.05 U	0.168	< 0.2 U	4.32	0.08 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1904S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.541	11.5	10.9	0.42	7.3	0.2 J	411
11/9/2020	Assessment	0.452	18.5	10.1	0.29	7.3	< 0.06 U	384

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1904S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.18	3.13	866	< 0.02 U	< 0.01 U	0.2 J	0.218	1.471	0.42	0.1 J	0.115	< 0.2 U	3.52	< 0.03 U	< 0.1 U
11/9/2020	Assessment	0.16	2.64	1,230	< 0.02 U	< 0.01 U	0.1 J	0.118	4.591	0.29	< 0.05 U	0.113	< 0.2 U	2 J	0.07 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1905D
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.515	155	3,220	< 0.4 U	7.0	8.1	5,180
11/9/2020	Assessment	0.519	181	3,140	0.3 J	7.7	< 0.3 U	5,240

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1905D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.31	5.40	5,080	< 0.04 U	< 0.02 U	0.3 J	0.163	7.36	< 0.4 U	< 0.1 U	0.991	< 0.2 U	7.17	< 0.06 U	< 0.1 U
11/9/2020	Assessment	< 0.1 U	5.21	12,600	< 0.1 U	< 0.05 U	< 0.2 U	< 0.1 U	10.38	0.3 J	< 0.2 U	0.935	< 0.2 U	4 J	< 0.2 U	< 0.5 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1905S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.184	83.5	334	0.33	6.7	69.3	810
11/9/2020	Assessment	0.236	66.8	177	0.36	7.5	72.5	598

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1905S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.12	2.39	166	< 0.02 U	< 0.01 U	0.348	1.22	1.886	0.33	0.1 J	0.110	< 0.2 U	97.0	0.7	< 0.1 U
11/9/2020	Assessment	1.62	6.25	285	< 0.02 U	< 0.01 U	0.285	0.642	2.515	0.36	0.1 J	0.113	< 0.2 U	93.6	0.6	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1906D
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	< 0.02 U	11.7	14.7	0.21	8.6	30.5	116
11/10/2020	Assessment	< 0.02 U	19.0	13.1	0.14	8.6	26.5	132

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1906D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.77	6.47	18.4	< 0.02 U	0.01 J	0.2 J	0.623	2.814	0.21	0.09 J	0.0139	< 0.2 U	39.9	0.3	< 0.1 U
11/10/2020	Assessment	1.03	4.63	23.5	< 0.02 U	0.02 J	0.09 J	0.500	1.845	0.14	0.2 J	0.0141	< 0.2 U	34.8	0.3	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1906S
Clinch River - Pond 1
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.375	39.3	19.7	0.51	6.4	147	297
11/10/2020	Assessment	0.407	45.6	15.4	0.45	8.7	124	294

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1906S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.16	3.61	62.4	< 0.02 U	< 0.01 U	0.2 J	1.31	2.366	0.51	0.2 J	0.121	< 0.2 U	451	0.5	< 0.1 U
11/10/2020	Assessment	0.29	4.15	57.6	< 0.02 U	< 0.01 U	0.07 J	0.457	5.343	0.45	< 0.05 U	0.150	< 0.2 U	389	0.4	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1907D
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	< 0.02 U	53.1	5.1	0.13	6.8	61.2	360
11/10/2020	Assessment	< 0.02 U	59.9	3.6	0.14	7.4	37.1	300

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1907D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	0.25	2.19	43.0	< 0.02 U	< 0.01 U	0.432	1.55	1.12	0.13	0.09 J	0.00423	< 0.2 U	7.64	0.04 J	< 0.1 U
11/10/2020	Assessment	0.08 J	2.11	37.7	< 0.02 U	< 0.01 U	0.07 J	1.01	2.074	0.14	< 0.05 U	0.00399	< 0.2 U	2.09	< 0.03 U	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1907S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	< 0.02 U	69.3	12.9	0.06 J	7.0	30.9	433
11/10/2020	Assessment	< 0.02 U	73.8	11.9	0.06 J	7.3	20.5	399

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1907S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	1.62	0.79	55.6	< 0.02 U	0.01 J	0.242	13.3	2.091	0.06 J	0.07 J	0.00691	8.87	7.40	0.3	< 0.1 U
11/10/2020	Assessment	0.34	0.50	49.9	< 0.02 U	< 0.01 U	0.1 J	12.8	2.158	0.06 J	0.07 J	0.00701	8.01	1 J	0.2 J	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1910S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/21/2020	Assessment	0.055	27.1	13.7	0.20	7.0	2.7	246
11/9/2020	Assessment	0.053	28.0	12.5	0.18	7.1	0.9	240

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1910S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/21/2020	Assessment	0.17	2.32	283	< 0.02 U	< 0.01 U	0.397	0.619	1.635	0.20	0.466	0.0136	< 0.2 U	17.1	0.2 J	< 0.1 U
11/9/2020	Assessment	0.17	1.88	268	< 0.02 U	< 0.01 U	0.1 J	0.388	2.39	0.18	0.310	0.0124	< 0.2 U	4.37	0.4	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1913D
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	0.727	56.8	21.9	0.18	9.9	132	326
11/10/2020	Assessment	0.816	55.6	15.2	0.33	11.0	131	295

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

Table 1 - Groundwater Data Summary: MW-1913D
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	0.22	10.8	50.6	< 0.02 U	< 0.01 U	0.253	0.280	0.931	0.18	0.2 J	0.0597	< 0.2 U	362	0.4	< 0.1 U
11/10/2020	Assessment	0.29	9.69	45.9	< 0.02 U	< 0.01 U	0.09 J	0.161	0.853	0.33	0.1 J	0.139	< 0.2 U	403	0.5	< 0.1 U

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1913S
Clinch River - Pond 1
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.059	59.6	32.5	0.1 J	7.0	139	373
11/10/2020	Assessment	0.057	62.5	32.6	0.13	7.7	134	357

Notes:
mg/L: milligrams per liter
SU: standard unit
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed

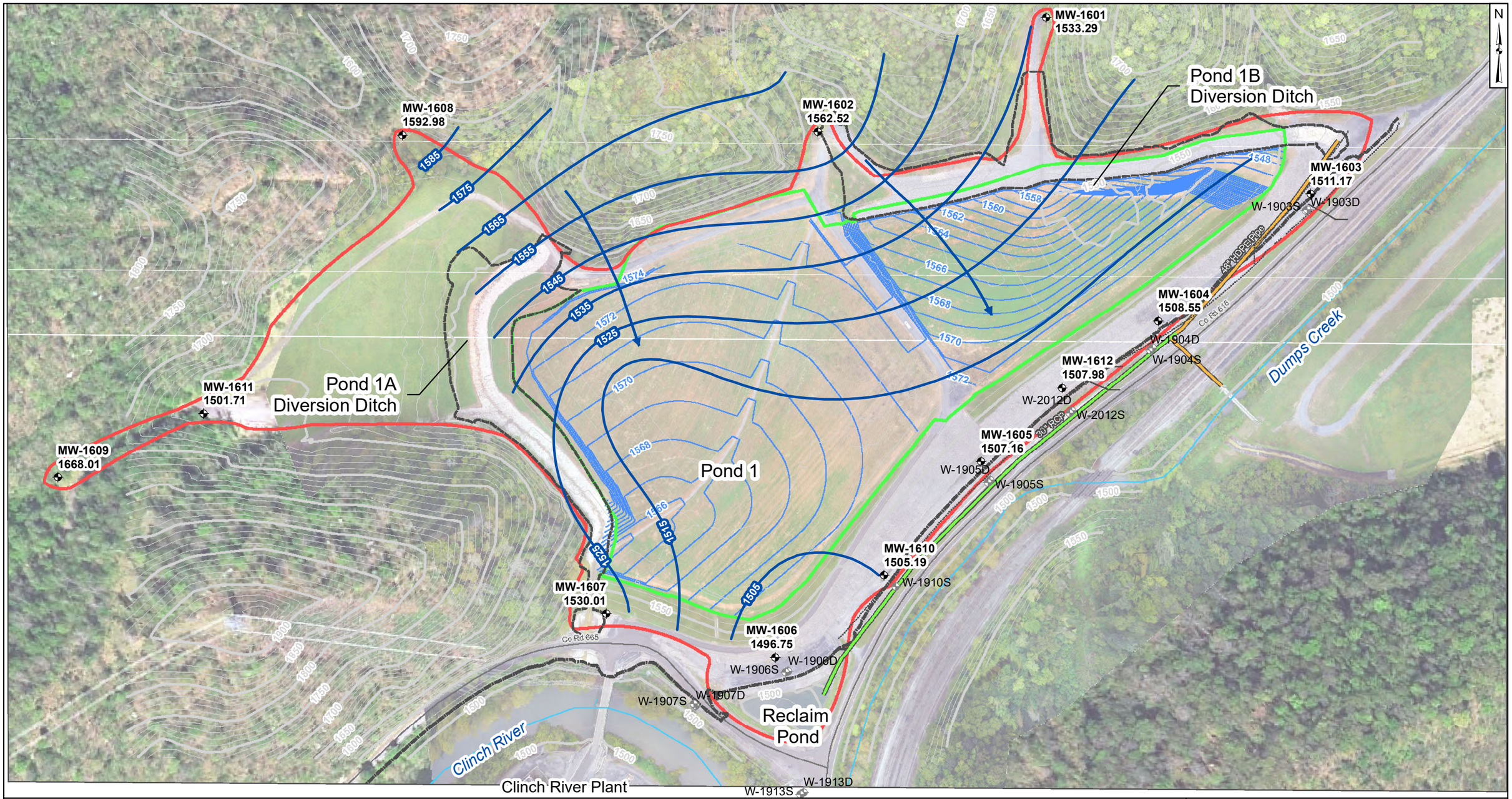
Table 1 - Groundwater Data Summary: MW-1913S
Clinch River - Pond 1
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.07 J	1.33	111	< 0.02 U	< 0.01 U	0.2 J	29.7	2.94	0.1 J	4.54	0.00221	< 0.2 U	63.3	0.1 J	0.1 J
11/10/2020	Assessment	0.33	1.14	94.0	< 0.02 U	< 0.01 U	0.05 J	32.9	2.934	0.13	5.36	0.00161	< 0.2 U	57.5	0.03 J	0.2 J

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.
J: Estimated value. Parameter was detected at concentration below the reporting limit
- -: Not analyzed
pCi/L: picocuries per liter

Groundwater Flow Direction Maps



Legend

- Groundwater Monitoring Well
- Nature and Extent Well
- Groundwater Elevation Contour
- Groundwater Flow Direction
- Post-Closure Topographic Elevation
- 100 yr Flood Elevation Approx. 1505 ft amsl
- Diversion Ditch
- Facility Boundary
- Pond 1 CCR Unit Boundary

Notes

- Monitoring well coordinates and water level data (collected on February 10, 2020) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- MW-1609 is not included in the contouring. It is a background cross-gradient monitoring well screened in the Rome Formation.
- MW-1611 is not included in the contouring. It is a special condition background monitoring well screened across the Dumps Fault to monitor potential lateral migration of groundwater.

300 150 0 300 Feet

Potentiometric Surface Map - Uppermost Aquifer
February 2020

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia

Geosyntec consultants

Ann Arbor, Michigan | 2021/01/14

Figure **2**

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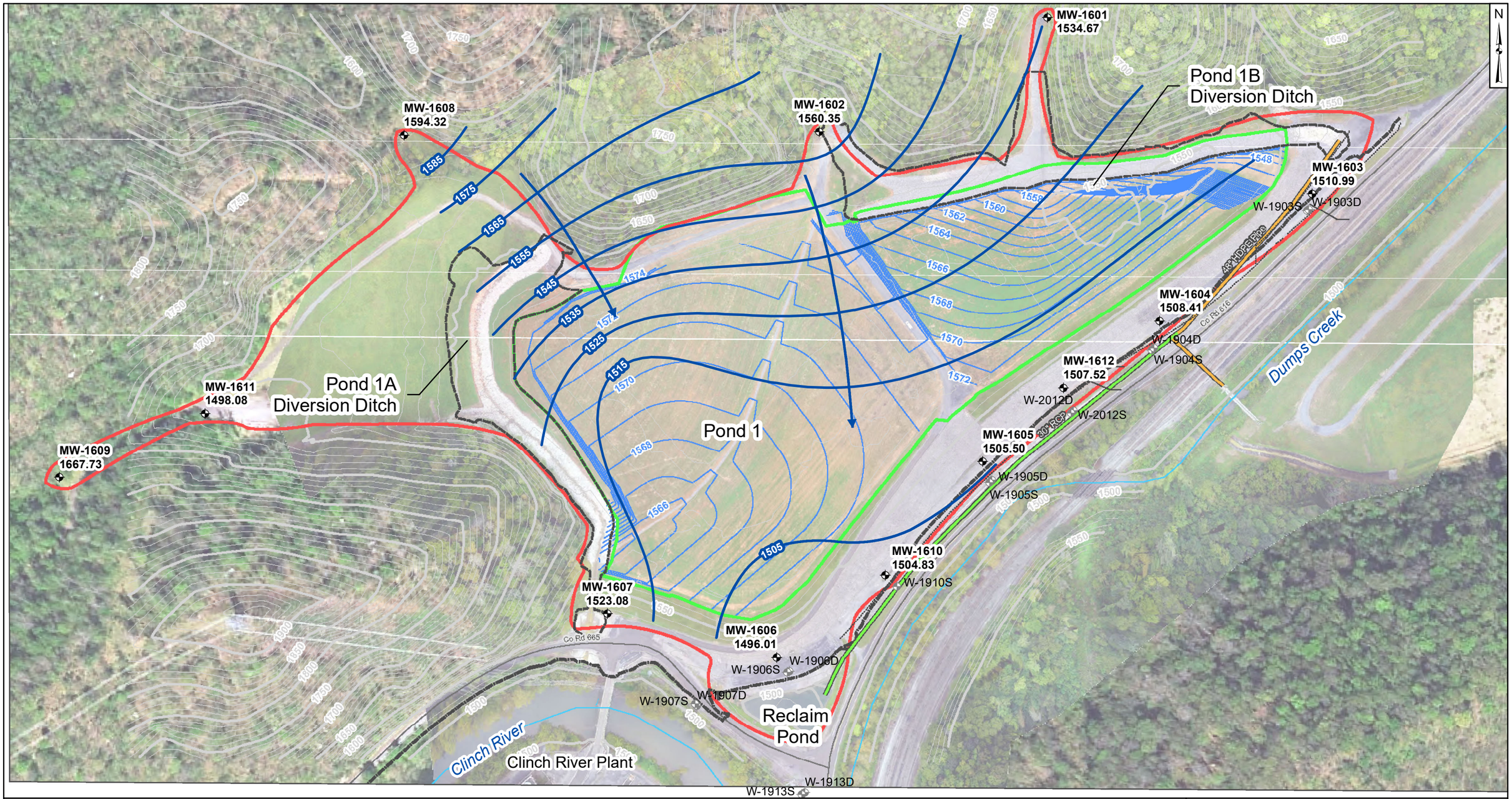


Legend

- Groundwater Monitoring Well
- Nature and Extent Well
- Groundwater Elevation Contour
- Groundwater Flow Direction
- Post-Closure Topographic Elevation
- 100 yr Flood Elevation Approx. 1505 ft amsl
- Diversion Ditch
- Facility Boundary
- Pond 1 CCR Unit Boundary

Notes

- Monitoring well coordinates and water level data (collected on April 20, 2020) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- MW-1609 is not included in the contouring. It is a background cross-gradient monitoring well screened in the Rome Formation.
- MW-1611 is not included in the contouring. It is a special condition background monitoring well screened across the Dumps Fault to monitor potential lateral migration of groundwater.

300 150 0 300 Feet

Potentiometric Surface Map - Uppermost Aquifer
April 2020

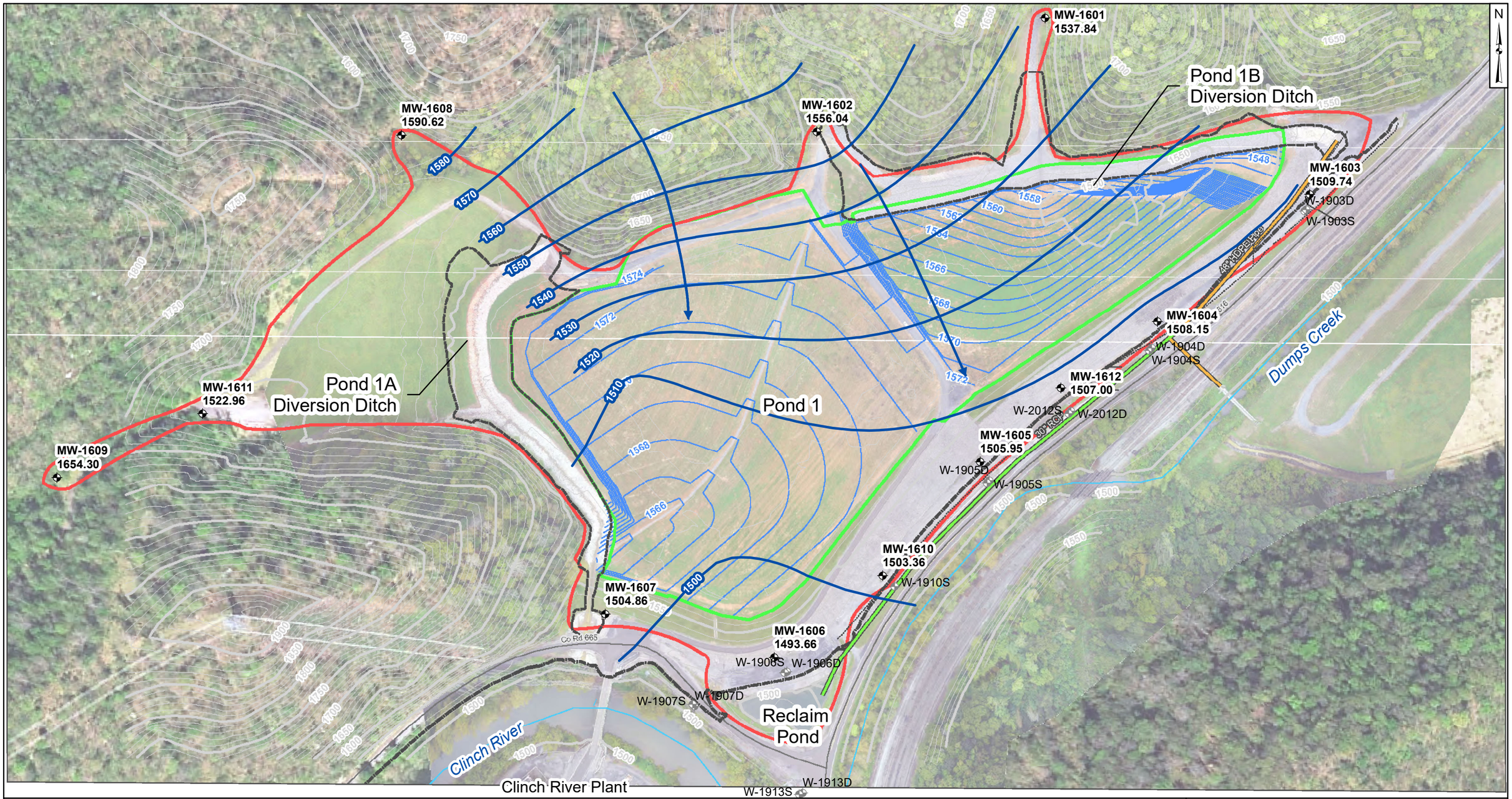
AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia

Geosyntec consultants

Ann Arbor, Michigan | 2021/01/14

Figure **3**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Clinch River\2020\AEP-ClinchRiver_BAP_GW_2020-04_Apr.mxd. ARevezzo. 1/14/2021. CHA8423.



Legend

- Groundwater Monitoring Well
- Nature and Extent Well
- Groundwater Elevation Contour
- Groundwater Flow Direction
- Post-Closure Topographic Elevation
- 100 yr Flood Elevation Approx. 1505 ft amsl
- Diversion Ditch
- Facility Boundary
- Pond 1 CCR Unit Boundary

Notes

- Monitoring well coordinates and water level data (collected on October 6, 2020) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- MW-1609 is not included in the contouring. It is a background cross-gradient monitoring well screened in the Rome Formation.
- MW-1611 is not included in the contouring. It is a special condition background monitoring well screened across the Dumps Fault to monitor potential lateral migration of groundwater.

300 150 0 300 Feet

Potentiometric Surface Map - Uppermost Aquifer October 2020

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia

Geosyntec consultants

Ann Arbor, Michigan | 2021/01/14

Figure 4

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Clinch River\2020\AEP-ClinchRiver_BAP_GW_2020-10_Oct.mxd. ARevezzo. 1/14/2021. CHA8423.

Groundwater Flow Velocity Calculations

Table 2: Residence Time Calculation Summary
Clinch River Pond 1A/1B

Geosyntec Consultants, Inc.

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2017-10		2017-12		2018-02		2018-04		2018-06	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Pond 1A/1B	MW-1601[1]	2.0	120	0.51	109	0.56	112	0.54	95	0.64	15.8	3.8
	MW-1602[1]	2.0	123	0.50	129	0.47	146	0.42	130	0.47	121	0.50
	MW-1603[2]	2.0	0.72	84	1.3	45	19.2	3.2	20	3.1	20.9	2.9
	MW-1604[2]	2.0	26.1	2.3	24	2.5	29	2.1	29	2.1	34	1.8
	MW-1605[2]	2.0	37	1.7	36	1.7	38	1.6	39	1.6	39	1.6
	MW-1606[2]	2.0	51	1.2	33	1.9	68	0.90	47	1.3	37	1.7
	MW-1607[2]	2.0	65	0.94	30	2.0	9.5	6.4	58	1.1	46	1.3
	MW-1608[1]	2.0	84	0.72	124	0.5	110	0.55	121	0.50	122	0.50
	MW-1609[1]	2.0	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	MW-1610[2]	2.0	54	1.1	52	1.17	20.1	3.0	48	1.3	46	1.3
	MW-1611[1]	2.0	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	MW-1612[2]	2.0	NC	NC	53	1.2	52	1.2	59	1.0	69	0.9

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2018-08		2018-10		2018-12		2019-02		2019-04		2019-05	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Pond 1A/1B	MW-1601[1]	2.0	90	0.67	27	2.3	27	2.2	38	1.6	374	0.16	263	0.23
	MW-1602[1]	2.0	124	0.49	122	0.50	122	0.50	121	0.50	3.1	19.7	4	14.0
	MW-1603[2]	2.0	18.5	3.3	24.1	2.5	25	2.4	26	2.4	30	2.1	32	1.9
	MW-1604[2]	2.0	33	1.8	34.9	1.7	37	1.6	41	1.5	47	1.3	48	1.3
	MW-1605[2]	2.0	40	1.5	40.7	1.5	40	1.5	44	1.4	25	2.4	26	2.4
	MW-1606[2]	2.0	29	2.1	50	1.2	42	1.4	46	1.3	49	1.2	46	1.3
	MW-1607[2]	2.0	159	0.38	60	1.0	51	1.2	25	2.4	1.3	46	1	44
	MW-1608[1]	2.0	121	0.50	114	0.53	120	0.51	118	0.52	75	0.81	77	0.79
	MW-1609[1]	2.0	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	MW-1610[2]	2.0	50	1.2	49	1.2	51	1.2	4.9	12.5	41	1.5	44	1.4
	MW-1611[1]	2.0	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	MW-1612[2]	2.0	77	0.79	72	0.85	72	0.9	53	1.2	60	1.0	53	1.1

Notes:
[1] - Background Well
[2] - Downgradient Well
NC - Not Calculated

Table 2: Residence Time Calculation Summary
Clinch River Pond 1A/1B

Geosyntec Consultants, Inc.

			2020-02		2020-04		2020-10	
CCR Management Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Pond 1A/1B	MW-1601[1]	2.0	75	0.8	44	1.4	51	1.2
	MW-1602[1]	2.0	44	1.4	133	0.5	106	0.6
	MW-1603[2]	2.0	36	1.7	38	1.6	44	1.4
	MW-1604[2]	2.0	48	1.3	48	1.3	45	1.3
	MW-1605[2]	2.0	44	1.4	29	2.1	41	1.5
	MW-1606[2]	2.0	63	1.0	57	1.1	27	2.2
	MW-1607[2]	2.0	80	0.8	66	0.9	42	1.4
	MW-1608[1]	2.0	139	0.4	127	0.5	120	0.5
	MW-1609[1]	2.0	NC	NC	NC	NC	NC	NC
	MW-1610[2]	2.0	26	2.3	3	24.1	78	0.8
	MW-1611[1]	2.0	NC	NC	NC	NC	NC	NC
	MW-1612[2]	2.0	58	1.1	54	1.1	89	0.7

Notes:
[1] - Background Well
[2] - Downgradient Well
NC - Not Calculated

APPENDIX 2 – Statistical Analyses

The memorandums summarizing the statistical evaluation follow.

STATISTICAL ANALYSIS SUMMARY
ASH POND 1
Clinch River Plant
Carbo, Virginia

Submitted to

1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by

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August 17, 2020

CHA8500

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LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSD	Statistically Significant Decrease
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
SU	Standard Units
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit

SECTION 1

EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at Ash Pond 1, an existing CCR unit at the Clinch River Plant located in Carbo, Virginia.

Eight monitoring events were completed from December 2017 to December 2018 to establish background concentrations for Appendix III and Appendix IV parameters under the CCR rule. Data collected through April 2019 were compared to the background concentrations to evaluate whether statistically significant increases (SSIs) or statistically significantly levels (SSLs) of Appendix III or Appendix IV constituents, respectively, were identified. SSIs were identified for calcium, chloride, and sulfate and a significantly significant decrease (SSD) was noted for pH. SSLs were identified for barium, cobalt, lithium, and molybdenum at Ash Pond 1 (Geosyntec, 2019). An alternative source was not identified, so Ash Pond 1 initiated an assessment of corrective measures in accordance with 40 CFR 257.96 and has been completing assessment monitoring since. Two assessment monitoring events were conducted at Ash Pond 1 in February 2020 and April 2020, in accordance with 40 CFR 257.95. The results of these assessment events are documented in this report.

Monitoring data from the February and April 2020 event underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact the usability of the data.

Groundwater data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The statistics were completed in three separate groups which correspond to differences in the underlying geology at the monitoring locations. Groundwater protection standards (GWPSs) were re-established for the Appendix IV parameters to assess whether Appendix IV parameters were present at an SSL above the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum. Thus, the unit will continue the assessment of corrective measures process and will monitor the groundwater monitoring network in accordance with the assessment monitoring program as required by 40 CFR 275.96(b). Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

SECTION 2

BOTTOM ASH POND EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, two sets of samples were collected for analysis from each background and compliance well throughout three geologically distinct monitoring well networks to meet the requirements of 40 CFR 257.95(b) (February 2020) and 40 CFR 257.95(d)(1) (April 2020). The geological units consist of the Chattanooga Shale, the Rome Limestone, and the Dumps Fault water-bearing unit. Samples from the February and April 2020 events were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during these assessment monitoring events may be found in Table 1.

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) samples, and laboratory fortified blanks (LFBs).

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location information and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.26d statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for Ash Pond 1 were conducted in accordance with the April 2019 *Statistical Analysis Plan* (AEP, 2019), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in February and April 2020 were screened for potential outliers. No outliers were identified for these events. Outliers identified for the background monitoring period were previously reported (Geosyntec, 2019).

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (AEP, 2019). The established GWPS was determined to be the greater value of (1) the background concentration and (2) the maximum contaminant level (MCL) or the level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from

the background wells collected during the background monitoring and assessment monitoring events. Generally, tolerance limits were calculated parametrically with 95% coverage and 95% confidence. Non-parametric tolerance limits were calculated in instances where data have either non-normal distributions or a high non-detect frequency. Non-parametric tolerance limits for Chattanooga Shale wells were calculated for arsenic, barium, beryllium, cadmium, fluoride, mercury, selenium, and thallium. Non-parametric tolerance limits for Rome Limestone wells were calculated for beryllium, mercury, selenium, and thallium. Non-parametric tolerance limits for Dumps Fault wells were calculated for beryllium, cadmium, mercury, molybdenum, and thallium. Tolerance limits and the final GWPSs are summarized in Tables 2A-2C.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

The following SSLs were identified at Clinch River Ash Pond 1:

- The LCL for barium at MW-1604 (3.09 mg/L) exceeded the GWPS of 2.00 mg/L in the Chattanooga formation.

- The LCL for cobalt at MW-1607 (0.00811 mg/L) exceeded the GWPS of 0.006 mg/L, the LCLs for lithium at MW-1606 (0.0608 mg/L) and MW-1607 (0.117 mg/L) exceeded the GWPS of 0.040 mg/L, and the LCL for molybdenum at MW-1607 (0.129 mg/L) exceeded the GWPS of 0.100 mg/L in the Rome Formation.

- The LCL for cobalt at MW-1610 (0.00745 mg/L) exceeded the GWPS of 0.006 mg/L and the LCL for molybdenum at MW-1610 (0.140 mg/L) exceeded the GWPS of 0.100 mg/L in the Dumps Fault water bearing unit.

As a result, Clinch River Ash Pond 1 will continue the assessment of corrective measures and continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96(b).

2.2.3 Evaluation of Potential Appendix III SSIs

While SSLs were identified, a review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Prediction limits were calculated for the Appendix III parameters to represent background values. As described in the January 2020 *Statistical Analysis Summary* report (Geosyntec, 2020):

- Intrawell tests were used to evaluate potential SSIs for boron, sulfate, and total dissolved solids (TDS) in the Chattanooga formation, whereas interwell tests were used for calcium, chloride, fluoride, and pH in the Chattanooga formation.

- Intrawell tests were used to evaluate potential SSIs for boron, calcium, fluoride, pH, and TDS in the Rome formation, whereas interwell tests were used for chloride and sulfate in the Rome formation.

- Intrawell tests were used to evaluate potential SSIs for all Appendix III parameters in the Dumps Fault formation.

The prediction limits were calculated for a one-of-two retesting procedure. Data collected during the February and April 2020 assessment monitoring events from downgradient compliance wells were compared to previously calculated prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Table 3. The following SSIs above the upper prediction limits (UPLs) were noted:

- Calcium concentrations exceeded the Chattanooga Shale interwell UPL of 7.77 mg/L at MW-1603 (26.6 mg/L and 24.6 mg/L), MW-1604 (27.8 mg/L and 29.3 mg/L), MW-1605 (38.7 mg/L and 42.3 mg/L), and MW-1612 (40.1 mg/L and 54.4 mg/L).

- Chloride concentrations exceeded the Chattanooga Shale interwell UPL of 45.8 mg/L at MW-1603 (162 mg/L and 128 mg/L) and MW-1605 (160 mg/L and 163 mg/L).

- Chloride concentrations exceeded the Rome Limestone interwell UPL of 4.13 mg/L at MW-1606 (11.8 mg/L and 7.0 mg/L) and MW-1607 (6.6 mg/L and 6.7 mg/L).

- Sulfate concentrations exceeded the Rome Limestone interwell UPL of 22.3 mg/L at MW-1606 (35.4 mg/L and 25.4 mg/L) and MW-1607 (124 mg/L and 125 mg/L).

Additionally, the following statistically significant decreases (SSDs) below the lower prediction limits (LPLs) for pH were noted:

- pH values were below the Chattanooga Shale interwell LPL of 7.8 SU for MW-1603 (7.4 SU and 6.8 SU), MW-1604 (7.2 SU and 6.5 SU), and MW-1612 (7.3 SU and 6.2 SU).

An SSI (or SSD) was only noted if both the February and April sample at a monitoring well were both above (or below) the prediction limit, in accordance with the one-of-two retesting procedures. Thus, concentrations of Appendix III parameters exceeded background levels at compliance wells at the Clinch River Ash Pond 1 unit during assessment monitoring.

2.3 Conclusions

A semi-annual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues

identified that impacted data usability. GWPSs were re-established for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum.

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. pH results were also evaluated to assess whether pH results were below background levels. Calcium, chloride, and sulfate results exceeded background levels, and pH results were lower than background levels.

Based on this evaluation, the Clinch River Ash Pond 1 CCR unit will continue with the assessment of corrective measures and continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96b.

SECTION 3

REFERENCES

American Electric Power (AEP). 2019. Statistical Analysis Plan – Clinch River Plant. April.

Geosyntec Consultants (Geosyntec). 2019. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. July 15, 2019.

Geosyntec. 2020. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. January 22, 2020.

TABLES

Table 1 - Groundwater Data Summary
Clinch River Plant - Pond 1

Parameter	Unit	MW-1601		MW-1602		MW-1603		MW-1604		MW-1605		MW-1606	
		2/10/2020	4/20/2020	2/10/2020	4/20/2020	2/11/2020	4/21/2020	2/11/2020	4/21/2020	2/11/2020	4/21/2020	2/10/2020	4/20/2020
Antimony	µg/L	0.07 J	0.09 J	0.04 J	0.05 J	0.03 J	0.03 J	0.05 J	0.03 J	0.09 J	0.06 J	0.02 J	0.03 J
Arsenic	µg/L	10.1	11.5	1.52	1.21	2.32	2.00	2.40	2.03	3.14	1.95	8.09	2.80
Barium	µg/L	156	152	99.6	102	2,840	2,570	3,200	3,470	1,390	1,730	105	83.1
Beryllium	µg/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Boron	mg/L	0.563	0.523	0.617	0.605	0.362	0.256	0.404	0.392	0.571	0.535	0.084	0.04 J
Cadmium	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 J	0.02 J
Calcium	mg/L	4.94	4.95	3.07	3.83	26.6	24.6	27.8	29.3	38.7	42.3	54.5	59.2
Chloride	mg/L	20.5	18.9	3.7	3.9	162	128	21.9	24.7	160	163	11.8	7.0
Chromium	µg/L	0.231	0.242	0.2 J	0.1 J	0.2 J	0.234	0.2 J	0.1 J	0.455	0.335	0.380	0.2 J
Cobalt	µg/L	0.073	0.093	0.060	0.02 J	0.172	0.282	0.574	0.580	0.068	0.115	5.03	2.15
Combined Radium	pCi/L	2.08	2.26	1.37	0.673	2.02	1.01	1.60	2.09	0.663	1.39	2.82	2.82
Fluoride	mg/L	1.75	2.35	1.56	1.7	0.12	0.10	0.24	0.25	0.36	0.33	0.19	0.12
Lead	µg/L	0.2 U	0.05 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 J	0.713	0.253
Lithium	mg/L	0.0901	0.0904	0.0386	0.0382	0.0873	0.0661	0.0636	0.0759	0.174	0.191	0.0645	0.0267
Mercury	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Molybdenum	µg/L	1 J	1 J	2 J	2.52	0.5 J	0.9 J	2 U	0.9 J	0.7 J	2.68	61.4	29.3
Selenium	µg/L	0.04 J	0.06 J	0.2 U	0.06 J	0.2 U	0.08 J	0.2 U	0.03 J	0.2 U	0.2 U	0.1 J	0.2
Sulfate	mg/L	168	162	15.7	17.4	1.9	2.3	1.3	0.8	11.2	5.0	35.4	25.4
Thallium	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.1 J
Total Dissolved Solids	mg/L	1,350	1,320	504	510	515	528	393	401	699	678	321	287
pH	SU	8.7	8.2	9.1	8.6	7.4	6.8	7.2	6.5	8.0	7.0	7.3	6.6

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.
J: Estimated value. Parameter was detected in concentrations below the reporting limit.

Table 1 - Groundwater Data Summary
Clinch River Plant - Pond 1

Geosyntec Consultants

Parameter	Unit	MW-1607		MW-1608		MW-1609		MW-1610		MW-1611		MW-1612	
		2/11/2020	4/21/2020	2/10/2020	4/20/2020	2/10/2020	4/20/2020	2/11/2020	4/20/2020	2/11/2020	4/20/2020	2/11/2020	4/21/2020
Antimony	µg/L	0.03 J	0.04 J	0.03 J	0.02 J	0.1 U	0.1 U	0.35	1.46	0.03 J	0.02 J	0.05 J	0.15
Arsenic	µg/L	0.83	0.96	1.22	0.89	0.13	0.08 J	1.00	1.39	8.01	7.30	0.45	0.39
Barium	µg/L	69.8	72.4	29.8	28.9	355	337	272	261	112	113	2,050	2,600
Beryllium	µg/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Boron	mg/L	0.106	0.108	0.353	0.344	0.05 U	0.05 U	0.03 J	0.04 J	0.586	0.569	0.367	0.381
Cadmium	µg/L	0.17	0.17	0.05 U	0.05 U	0.01 J	0.01 J	0.03 J	0.06	0.05 U	0.05 U	0.05 U	0.05 U
Calcium	mg/L	47.3	48.5	0.748	0.959	65.6	66.0	36.8	39.2	25.8	26.0	40.1	54.4
Chloride	mg/L	6.6	6.7	5.2	4.6	1.1	1.1	10.5	10.6	17.9	17.0	33.3	9.9
Chromium	µg/L	0.1 J	0.209	0.618	0.413	0.1 J	0.2 J	0.209	0.800	0.221	0.2 J	0.2 J	0.216
Cobalt	µg/L	9.61	10.1	0.280	0.203	0.226	0.05 U	6.77	7.43	0.03 J	0.02 J	0.121	0.176
Combined Radium	pCi/L	1.66	0.978	0.594	1.50	2.79	5.26	1.18	1.84	0.348	1.94	1.89	2.65
Fluoride	mg/L	0.21	0.19	0.41	0.42	0.22	0.21	0.19	0.20	1.00	1.07	0.17	0.08
Lead	µg/L	0.684	0.667	0.25	0.2 J	1.25	0.323	4.96	4.04	0.06 J	0.2 U	0.2 U	0.07 J
Lithium	mg/L	0.112	0.120	0.0197	0.0185	0.000755	0.000559	0.173	0.180	0.0629	0.0646	0.106	0.107
Mercury	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Molybdenum	µg/L	131	134	2 J	1 J	0.6 J	2 U	144	143	3.89	2.08	2 J	0.8 J
Selenium	µg/L	0.4	0.7	0.04 J	0.05 J	0.1 J	0.2	0.3	0.3	0.04 J	0.04 J	0.03 J	0.03 J
Sulfate	mg/L	124	125	164	167	12.9	12.4	36.4	37.7	139	125	1.2	0.2 J
Thallium	µg/L	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Dissolved Solids	mg/L	279	275	422	418	287	276	245	254	697	662	520	495
pH	SU	8.0	7.0	9.1	8.2	7.6	7.0	7.8	6.9	8.0	7.1	7.3	6.2

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.
J: Estimated value. Parameter was detected in concentrations below the reporting limit.

Table 2A: Groundwater Protection Standards
Clinch River Plant - Ash Pond 1

Chattanooga Shale Monitoring Well Network			
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL
Antimony, Total (mg/L)	0.006		0.00024
Arsenic, Total (mg/L)	0.01		0.026
Barium, Total (mg/L)	2		0.31
Beryllium, Total (mg/L)	0.004		0.0001
Cadmium, Total (mg/L)	0.005		0.00005
Chromium, Total (mg/L)	0.1		0.0014
Cobalt, Total (mg/L)	n/a	0.006	0.00049
Combined Radium, Total (pCi/L)	5		3.0
Fluoride, Total (mg/L)	4		2.4
Lead, Total (mg/L)	n/a	0.015	0.008
Lithium, Total (mg/L)	n/a	0.04	0.19
Mercury, Total (mg/L)	0.002		0.001
Molybdenum, Total (mg/L)	n/a	0.1	0.02
Selenium, Total (mg/L)	0.05		0.00020
Thallium, Total (mg/L)	0.002		0.0005

Notes:
Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value
MCL = Maximum Contaminant Level
Calculated UTL (Upper Tolerance Limit) represents site-specific background values
The higher of the calculated UTL or MCL/Rule-Specified Level is used as the GWPS.

Table 2B: Groundwater Protection Standards
Clinch River Plant - Ash Pond 1

Rome Limestone Monitoring Well Network			
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL
Antimony, Total (mg/L)	0.006		0.00012
Arsenic, Total (mg/L)	0.01		0.0014
Barium, Total (mg/L)	2		0.54
Beryllium, Total (mg/L)	0.004		0.0001
Cadmium, Total (mg/L)	0.005		0.000041
Chromium, Total (mg/L)	0.1		0.00035
Cobalt, Total (mg/L)	n/a	0.006	0.0015
Combined Radium, Total (pCi/L)	5		5.5
Fluoride, Total (mg/L)	4		0.38
Lead, Total (mg/L)	n/a	0.015	0.0013
Lithium, Total (mg/L)	n/a	0.04	0.012
Mercury, Total (mg/L)	0.002		0.001
Molybdenum, Total (mg/L)	n/a	0.1	0.0026
Selenium, Total (mg/L)	0.05		0.0002
Thallium, Total (mg/L)	0.002		0.0005

Notes:
Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value
MCL = Maximum Contaminant Level
Calculated UTL (Upper Tolerance Limit) represents site-specific background values
The higher of the calculated UTL or MCL/Rule-Specified Level is used as the GWPS.

Table 2C: Groundwater Protection Standards
Clinch River Plant - Ash Pond 1

Geosyntec Consultants, Inc.

Dumps Fault Monitoring Well Network			
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL
Antimony, Total (mg/L)	0.006		0.00083
Arsenic, Total (mg/L)	0.01		0.046
Barium, Total (mg/L)	2		0.13
Beryllium, Total (mg/L)	0.004		0.0001
Cadmium, Total (mg/L)	0.005		0.00005
Chromium, Total (mg/L)	0.1		0.0011
Cobalt, Total (mg/L)	n/a	0.006	0.00016
Combined Radium, Total (pCi/L)	5		2.1
Fluoride, Total (mg/L)	4		1.30
Lead, Total (mg/L)	n/a	0.015	0.00022
Lithium, Total (mg/L)	n/a	0.04	0.18
Mercury, Total (mg/L)	0.002		0.001
Molybdenum, Total (mg/L)	n/a	0.1	0.0068
Selenium, Total (mg/L)	0.05		0.00012
Thallium, Total (mg/L)	0.002		0.0005

Notes:
Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value
MCL = Maximum Contaminant Level
Calculated UTL (Upper Tolerance Limit) represents site-specific background values
The higher of the calculated UTL or MCL/Rule-Specified Level is used as the GWPS.

Table 3: Appendix III Data Summary
Clinch River Plant - Pond 1

Analyte	Unit	Description	Chattanooga Shale							
			MW-1603		MW-1604		MW-1605		MW-1612	
			2/11/2020	4/21/2020	2/11/2020	4/21/2020	2/11/2020	4/21/2020	2/11/2020	4/21/2020
Boron	mg/L	Interwell Background Value (UPL)	0.599		0.524		0.722		0.603	
		Analytical Result	0.362	0.256	0.404	0.392	0.571	0.535	0.367	0.381
Calcium	mg/L	Interwell Background Value (UPL)	7.77							
		Analytical Result	**26.6**	**24.6**	**27.8**	**29.3**	**38.7**	**42.3**	**40.1**	**54.4**
Chloride	mg/L	Interwell Background Value (UPL)	45.8							
		Analytical Result	**162**	**128**	21.9	24.7	**160**	**163**	33.3	9.9
Fluoride	mg/L	Interwell Background Value (UPL)	0.218		0.301		0.454		0.273	
		Analytical Result	0.12	0.10	0.24	0.25	0.36	0.33	0.17	0.08
pH	SU	Interwell Background Value (UPL)	8.8							
		Interwell Background Value (LPL)	7.8							
		Analytical Result	**7.4**	**6.8**	**7.2**	**6.5**	8.0	**7.0**	**7.3**	**6.2**
Sulfate	mg/L	Interwell Background Value (UPL)	59.9		9.99		129		23.3	
		Analytical Result	1.9	2.3	1.3	0.8	11.2	5.0	1.2	0.2
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	798		424		892		642	
		Analytical Result	515	528	393	401	699	678	520	495

Analyte	Unit	Description	Rome Limestone			
			MW-1606		MW-1607	
			2/10/2020	4/20/2020	2/11/2020	4/21/2020
Boron	mg/L	Intrawell Background Value (UPL)	0.225		0.212	
		Analytical Result	0.084	0.04	0.106	0.108
Calcium	mg/L	Intrawell Background Value (UPL)	69.0		55.7	
		Analytical Result	54.5	59.2	47.3	48.5
Chloride	mg/L	Interwell Background Value (UPL)	4.13			
		Analytical Result	**11.8**	**7.0**	**6.6**	**6.7**
Fluoride	mg/L	Intrawell Background Value (UPL)	0.309		0.286	
		Analytical Result	0.19	0.12	0.21	0.19
pH	SU	Intrawell Background Value (UPL)	7.4		8.3	
		Intrawell Background Value (LPL)	6.7		7.3	
		Analytical Result	7.3	**6.6**	8.0	**7.0**
Sulfate	mg/L	Interwell Background Value (UPL)	22.3			
		Analytical Result	**35.4**	**25.4**	**124**	**125**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	399		491	
		Analytical Result	321	287	279	275

Analyte	Unit	Description	Dumps Fault	
			MW-1610	
			2/11/2020	4/20/2020
Boron	mg/L	Intrawell Background Value (UPL)	0.141	
		Analytical Result	0.03	0.04
Calcium	mg/L	Intrawell Background Value (UPL)	37.4	
		Analytical Result	36.8	**39.2**
Chloride	mg/L	Intrawell Background Value (UPL)	13.3	
		Analytical Result	10.5	10.6
Fluoride	mg/L	Intrawell Background Value (UPL)	0.237	
		Analytical Result	0.19	0.20
pH	SU	Intrawell Background Value (UPL)	7.9	
		Intrawell Background Value (UPL)	7.1	
		Analytical Result	7.8	**6.9**
Sulfate	mg/L	Intrawell Background Value (UPL)	53.9	
		Analytical Result	36.4	37.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	268	
		Analytical Result	245	254

Notes:
UPL: Upper prediction limit
LPL: Lower prediction limit
Bold values exceed the background value.
Background values are shaded gray.

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

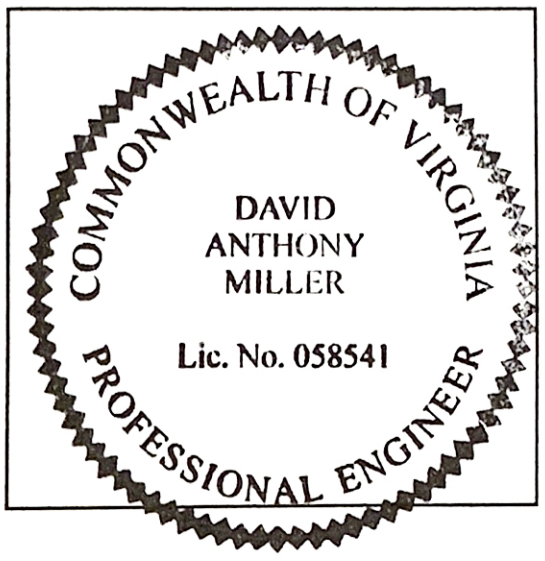
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Clinch River Ash Pond 1 CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



058541	VIRGINIA	08.17.2020
License Number	Licensing State	Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

July 15, 2020

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
941 Chatham Lane, #103
Columbus, OH 43221

RE: Clinch River Pond 1
April 2020 Assessment Monitoring Analysis

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical evaluation of groundwater data for the April 2020 Assessment Monitoring event at American Electric Power Company's Clinch River Pond 1. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Sampling began at the Clinch River Pond 1 in 2017 at each of the groundwater monitoring wells. The monitoring well network, as provided by Geosyntec Consultants, consists of the following three formations:

Chattanooga Shale:
Upgradient Wells: MW-1601, MW-1602, MW-1608
Downgradient Wells: MW-1603, MW-1604, MW-1605, MW-1612

Rome Limestone:
Cross-gradient (background) Well: MW-1609
Downgradient Wells: MW-1606, MW-1607

Dumps Fault:
Upgradient Well: MW-1611
Downgradient Well: MW-1610

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Kristina Rayner, Groundwater Statistician and Founder of Groundwater Stats Consulting. The statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC.

This analysis consists of the following constituents:

- **Appendix IV** (Assessment Monitoring) **–** antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series plots for all well/constituent pairs respective to their formations are provided and are particularly useful for screening parameters detected in downgradient wells which require statistical analyses (Figures A). Additionally, a separate section of box plots is included for all constituents at both upgradient and downgradient wells, also respective to their formations (Figures B). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells. During this analysis, the time series graphs were reviewed for any newly suspected outliers and none were identified; therefore, no formal testing with Tukey's outlier test was required. Values in background which have been flagged as outliers may be seen in a lighter font and as a disconnected symbol on the graphs. A summary of the previously flagged values follows this letter (Figures C).

Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of well/constituent pairs with 100% nondetects follows this letter. A substitution of the most recent reporting limit is used for nondetect data.

Evaluation of Appendix IV Parameters – April 2020

Interwell tolerance limits were used to calculate the site-specific background limits from pooled upgradient well data for Appendix IV parameters at their respective formations (Figures D). Parametric tolerance limits are used when data follow a normal or transformed-normal distribution and use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. When data contained greater than 50% nondetects or did not follow a normal or transformed-normal distribution, non-

parametric tolerance limits were used. The background limits were then used when determining the groundwater protection standard (GWPS) (Figures E).

Confidence intervals were then constructed on downgradient wells for each of the Appendix IV parameters using the highest limit of the MCL, CCR-Rule specified, or background limit as the GWPS, as discussed above (Figures F). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. If there is an exceedance of the GWPS, a statistically significant level (SSL) exceedance is identified. A summary of the confidence interval results follows this letter. Exceedances were noted for the following well/constituent pairs:

Chattanooga:

- Barium: MW-1604

Dumps Fault:

- Cobalt: MW-1610
- Molybdenum: MW-1610

Rome Limestone:

- Cobalt: MW-1606 and MW-1607
- Lithium: MW-1607
- Molybdenum: MW-1607

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Clinch River Pond 1. If you have any questions or comments, please feel free to contact us.

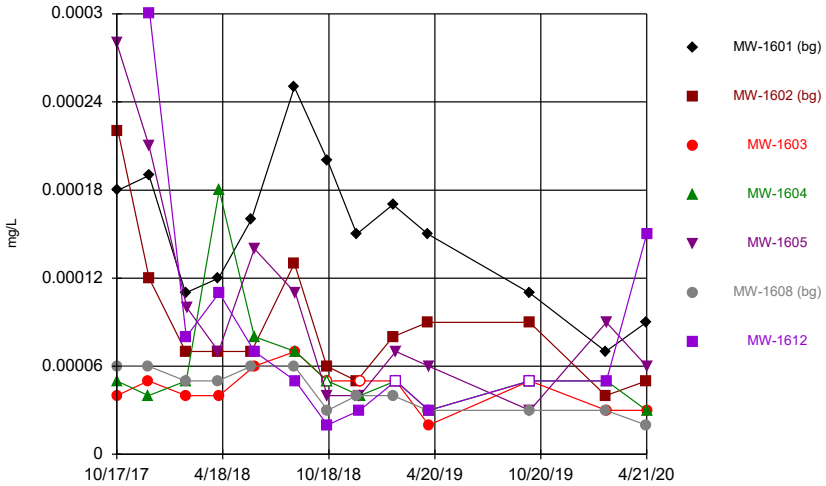
For Groundwater Stats Consulting,

Andrew T. Collins
Groundwater Analyst

Kristina L. Rayner
Groundwater Statistician

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

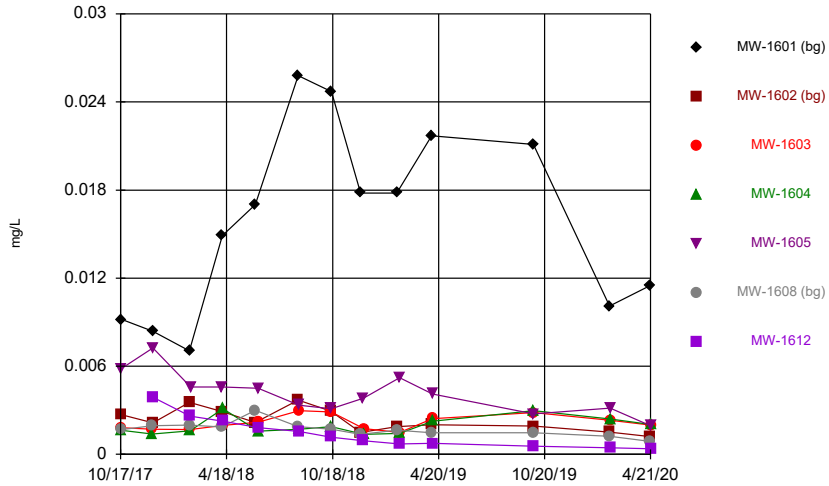
Time Series



Constituent: Antimony Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

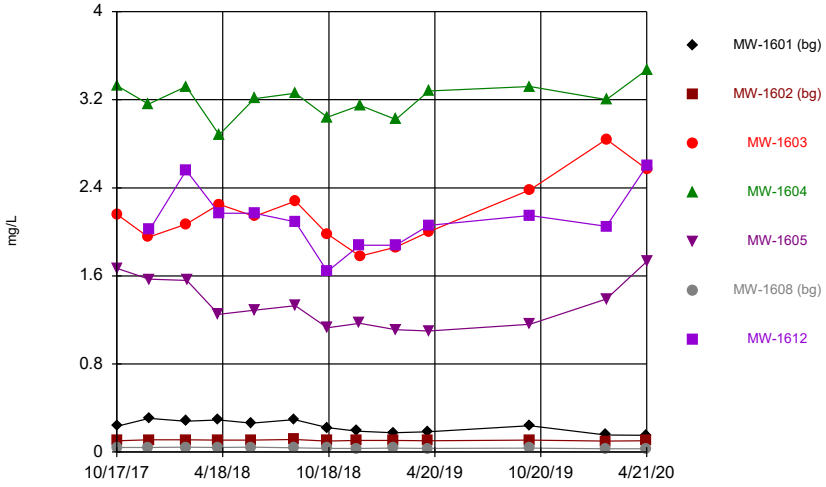
Time Series



Constituent: Arsenic Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Time Series



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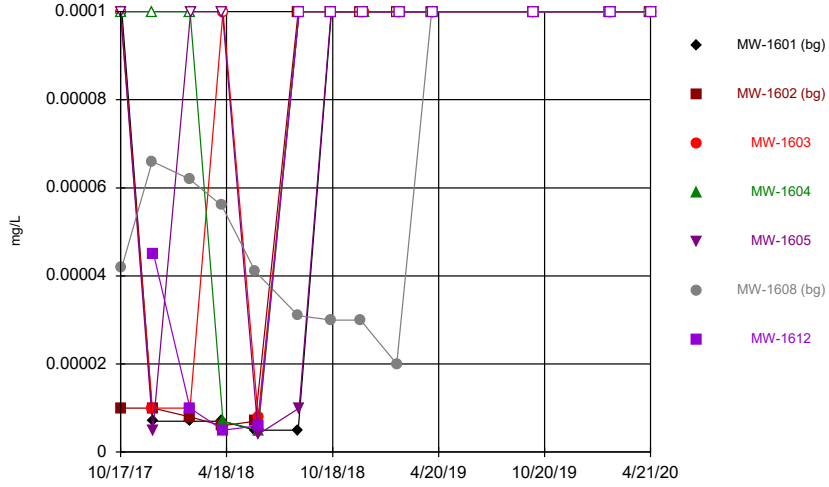
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

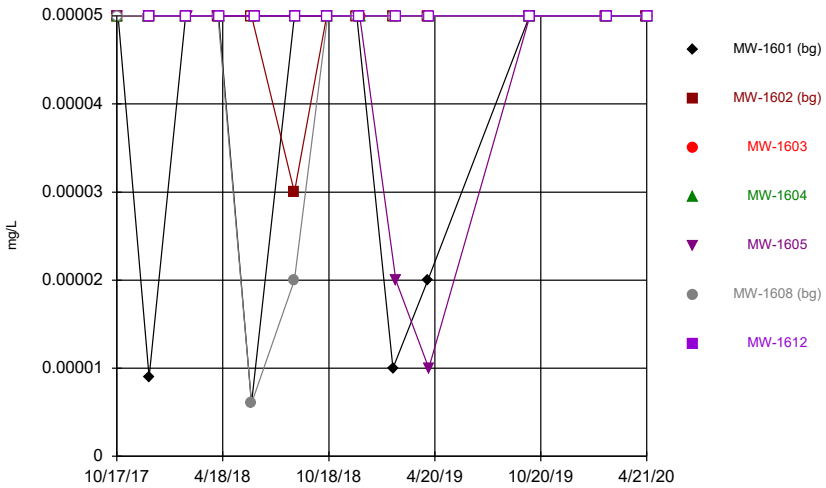
Time Series



Constituent: Beryllium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

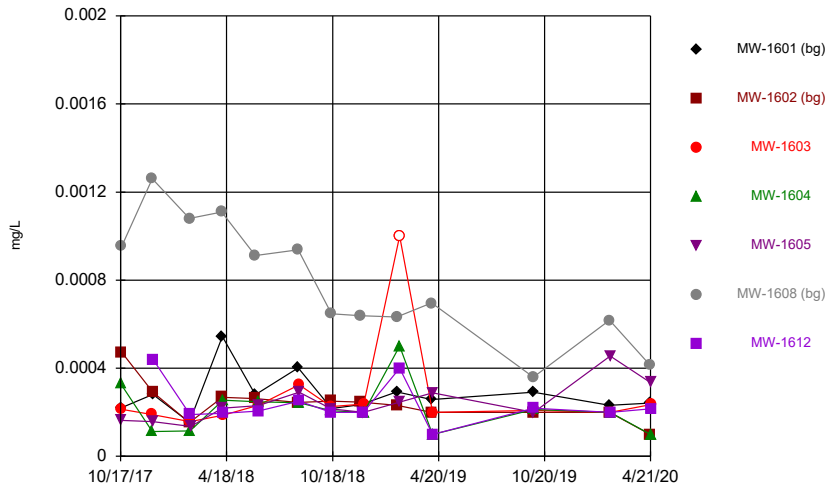
Time Series



Constituent: Cadmium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

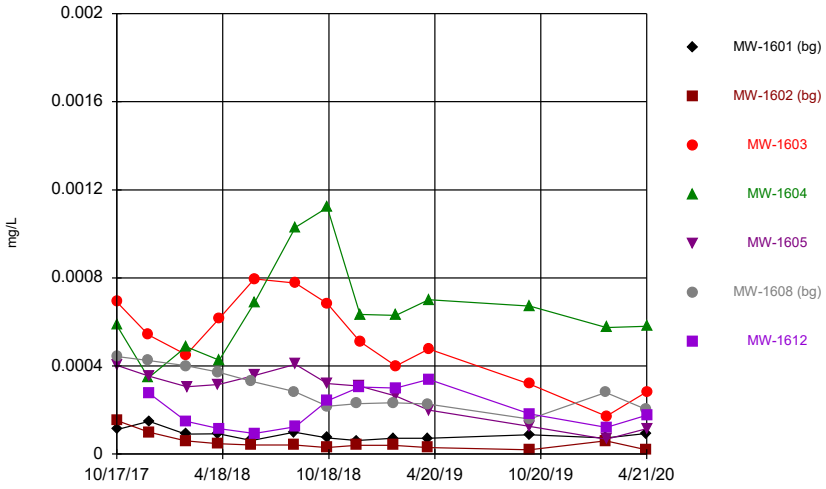
Time Series



Constituent: Chromium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

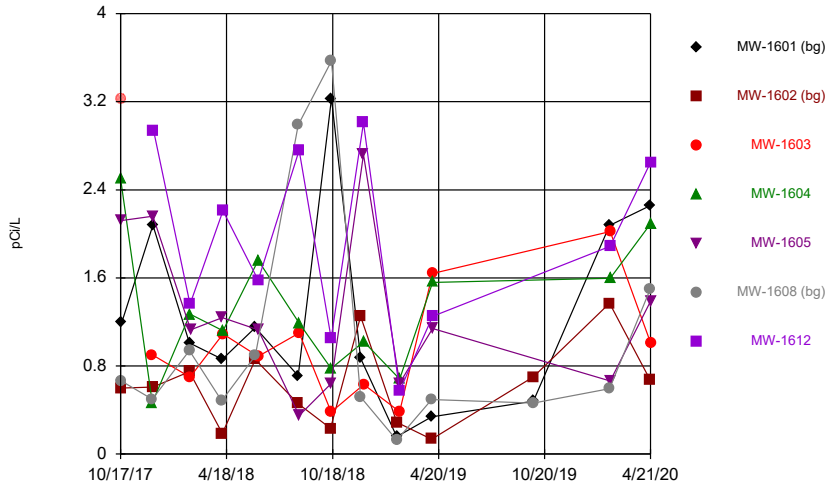
Time Series



Constituent: Cobalt Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

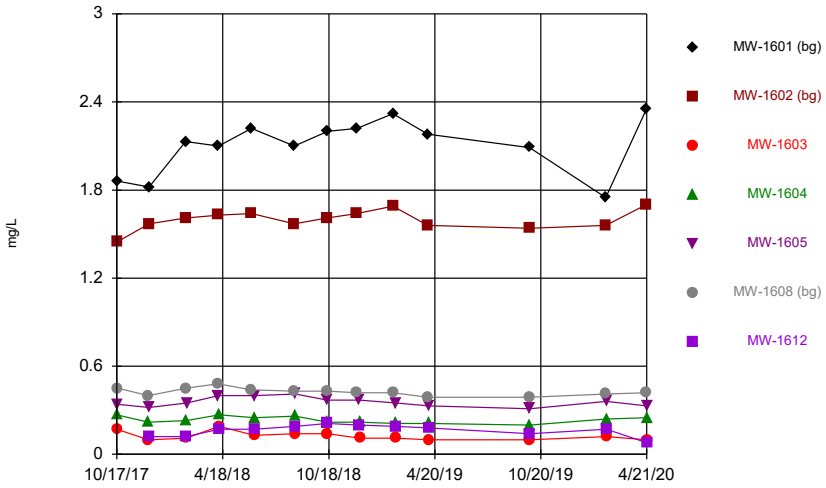
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Ap
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

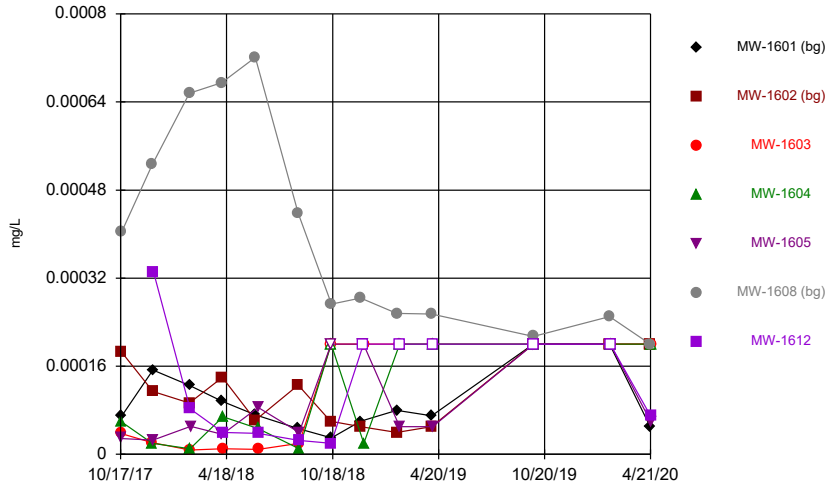
Time Series



Constituent: Fluoride Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Lead Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
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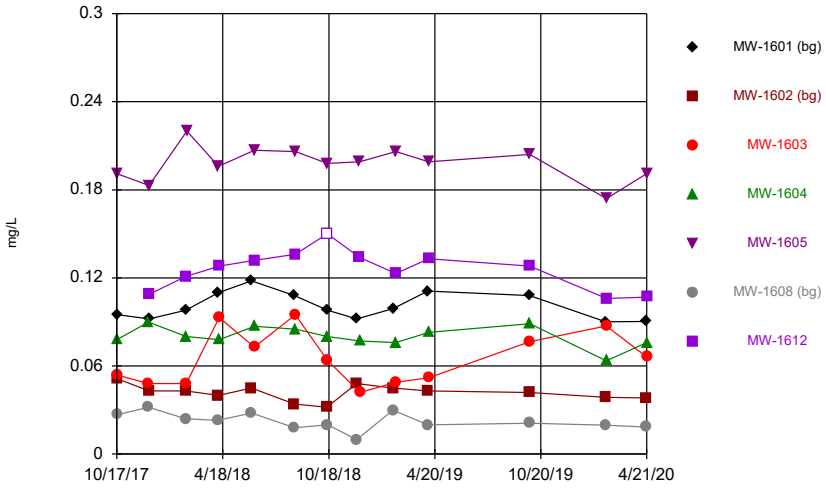
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Lithium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
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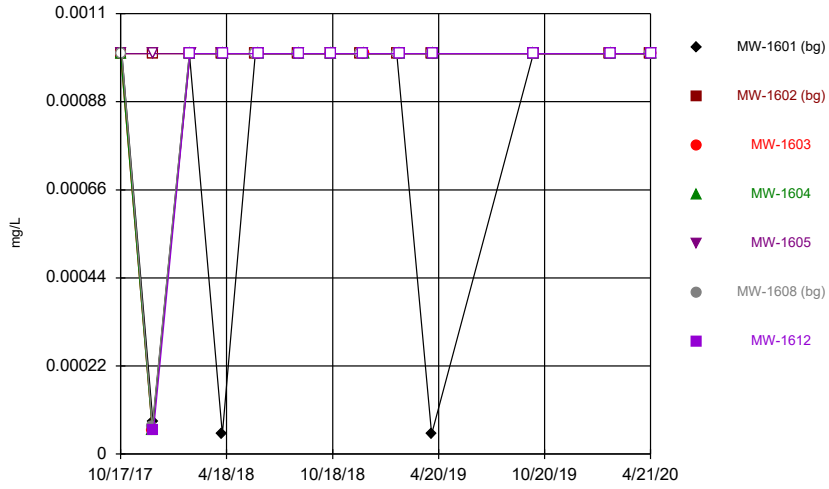
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Mercury Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
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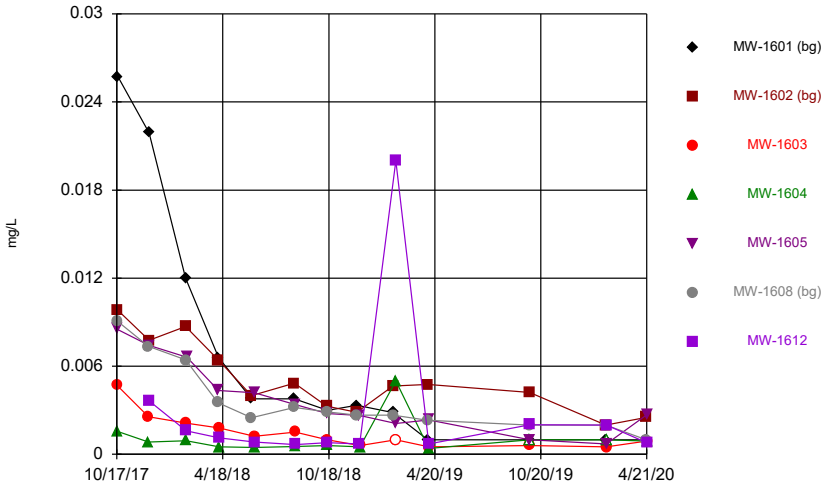
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Molybdenum Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
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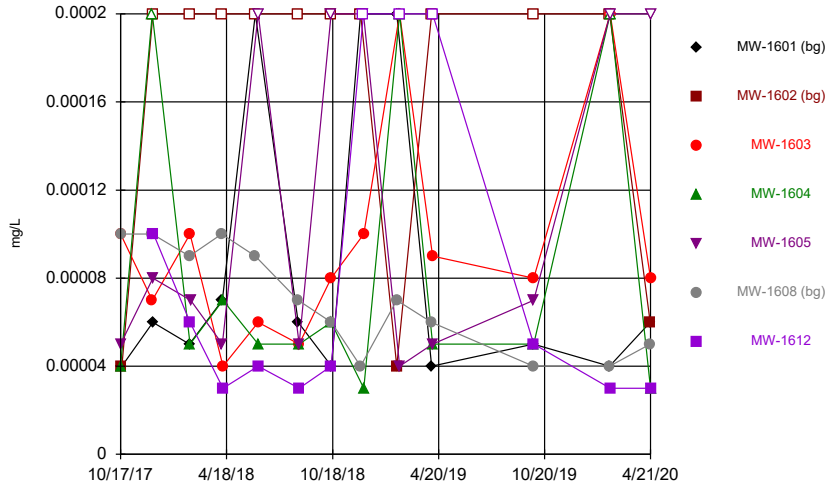
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
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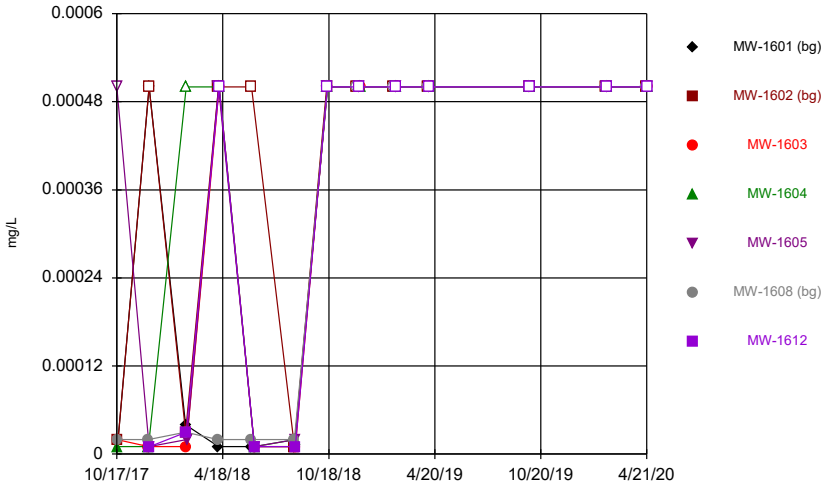
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

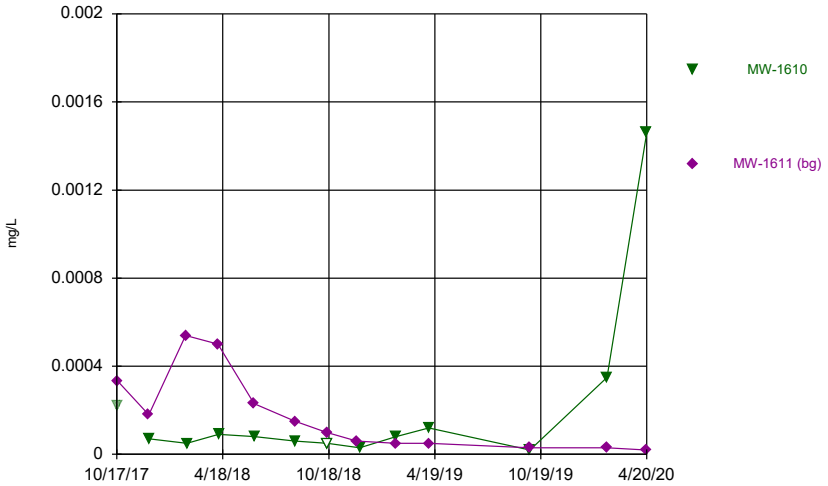
Time Series



Constituent: Thallium Analysis Run 7/9/2020 1:55 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

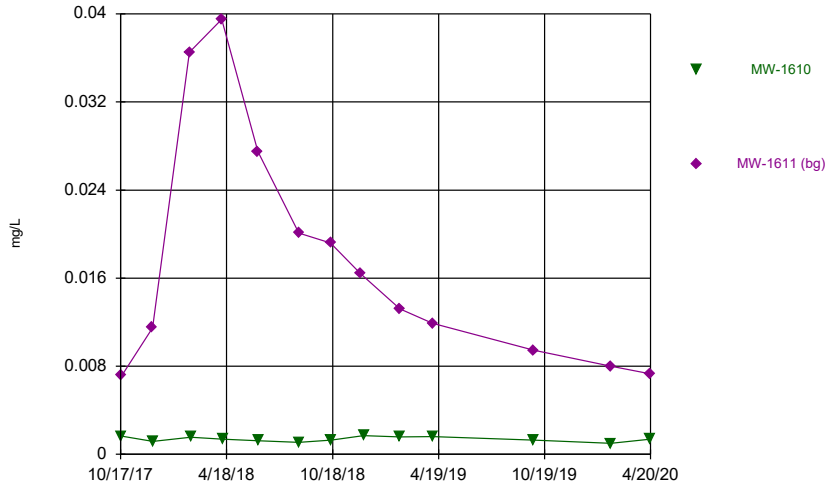
Time Series



Constituent: Antimony Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Time Series



Constituent: Arsenic Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

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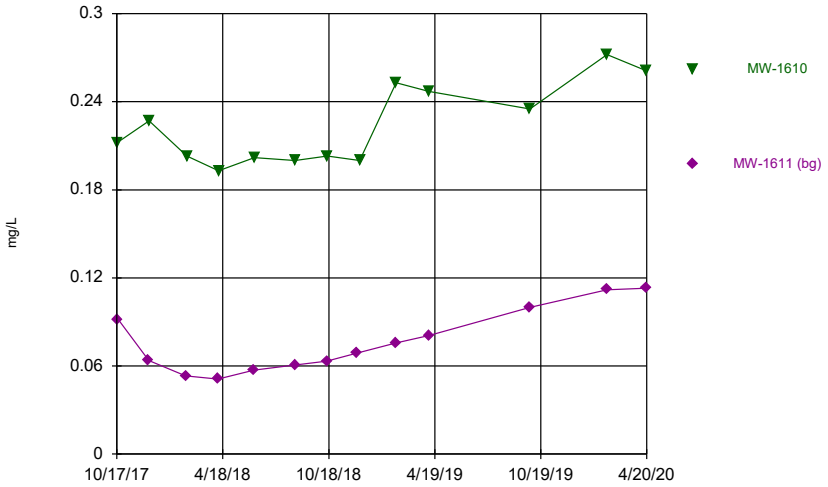
Time Series



Constituent: Barium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

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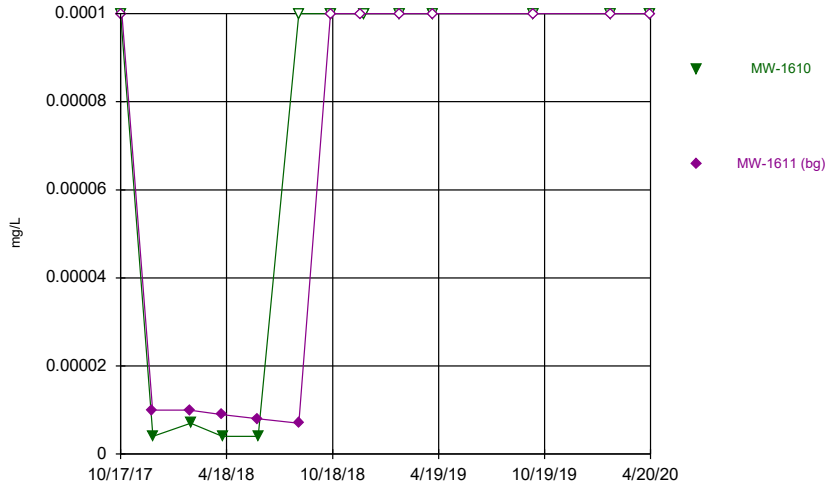
Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
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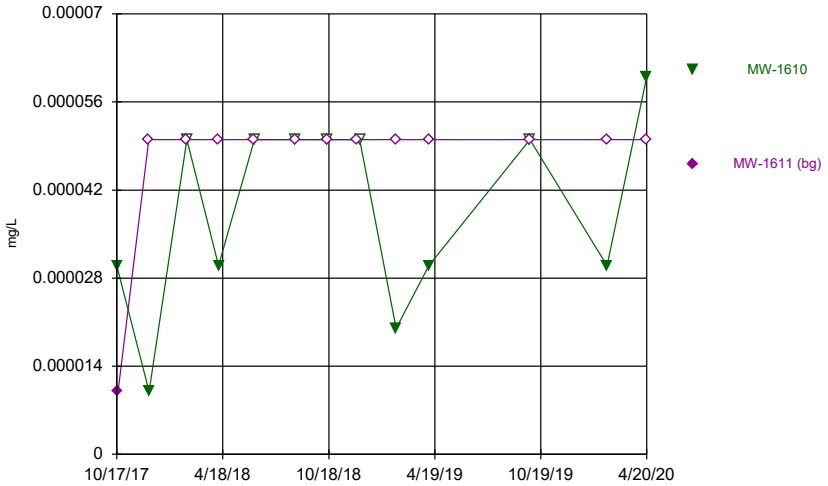
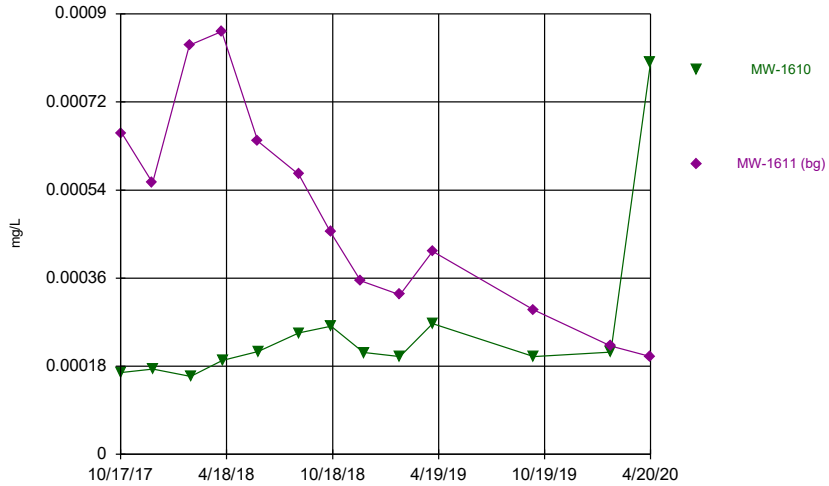
Time Series



Constituent: Cadmium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

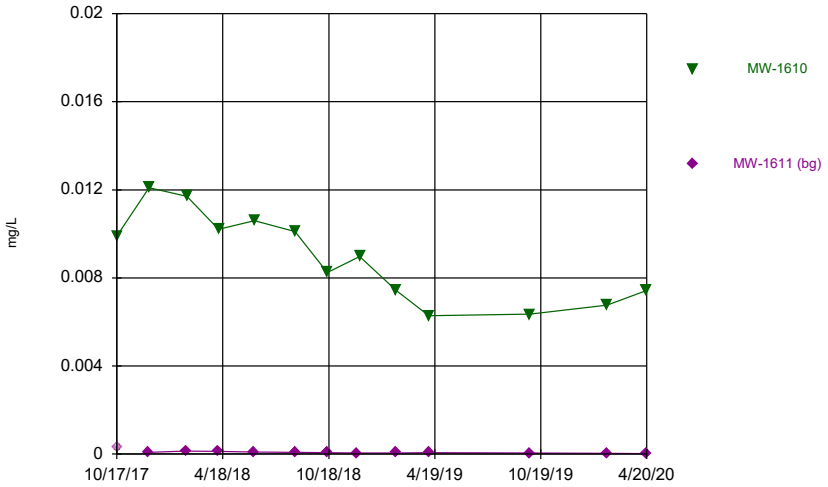
Time Series



Constituent: Chromium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

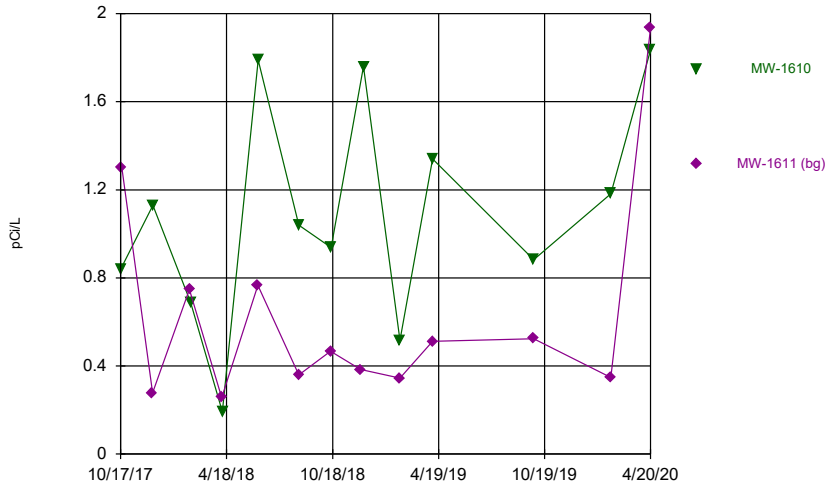
Time Series



Constituent: Cobalt Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

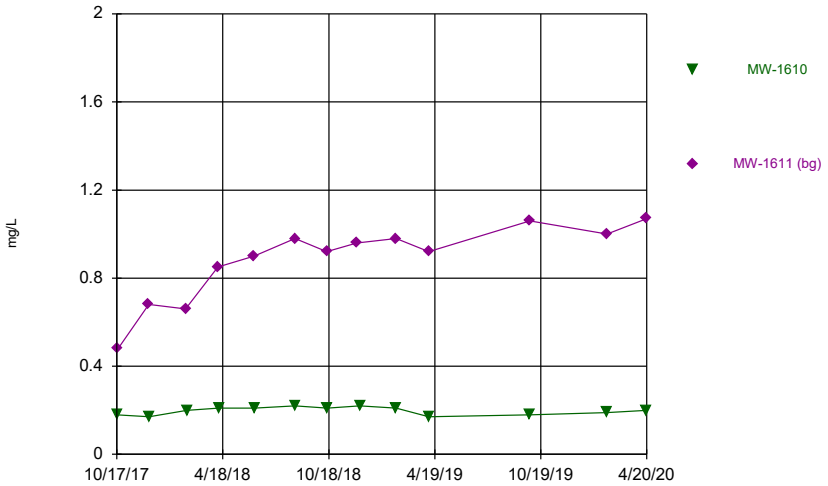
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

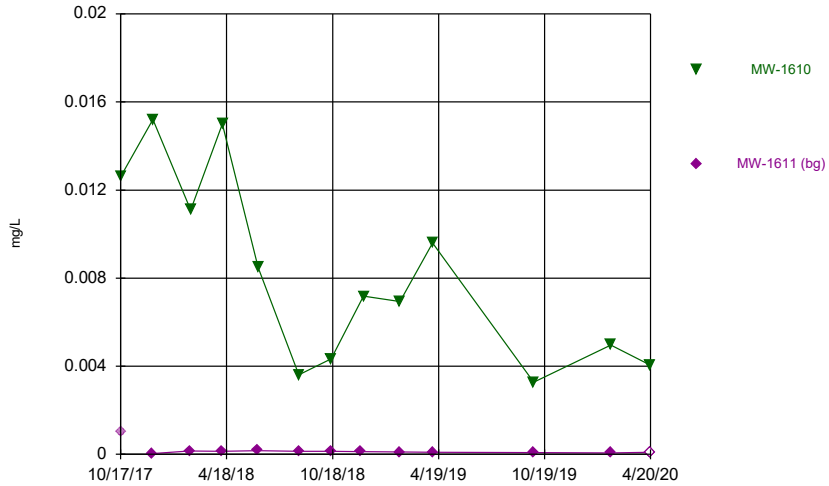
Time Series



Constituent: Fluoride Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

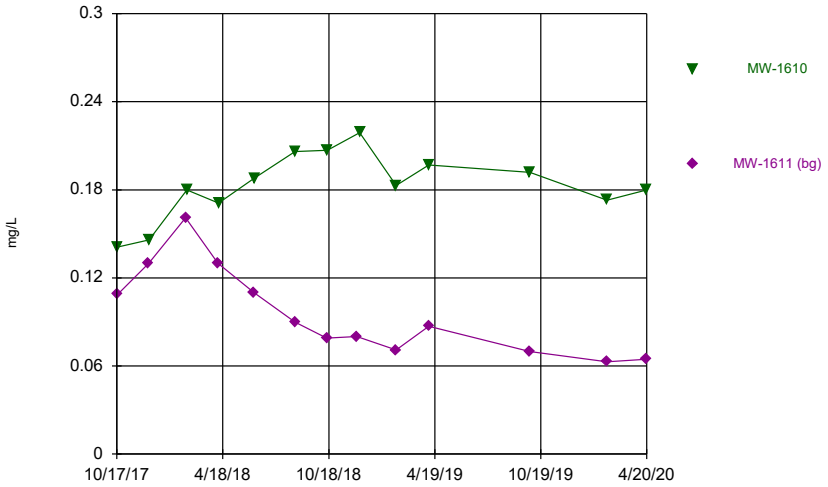
Time Series



Constituent: Lead Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

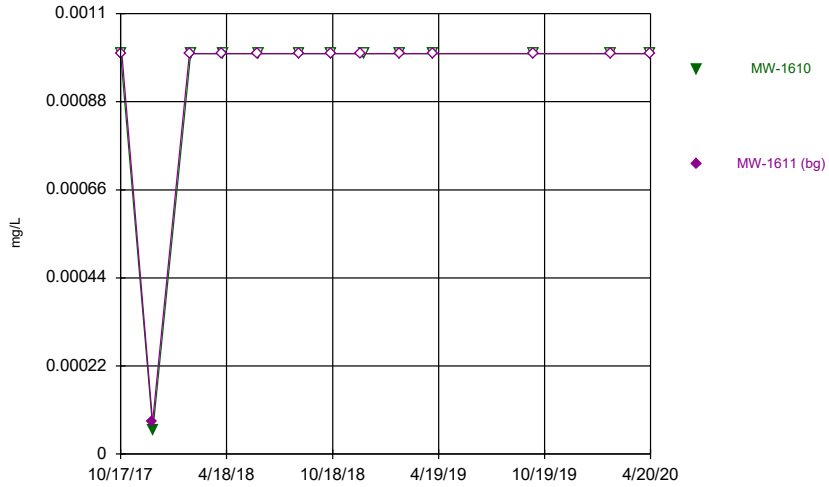
Time Series



Constituent: Lithium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

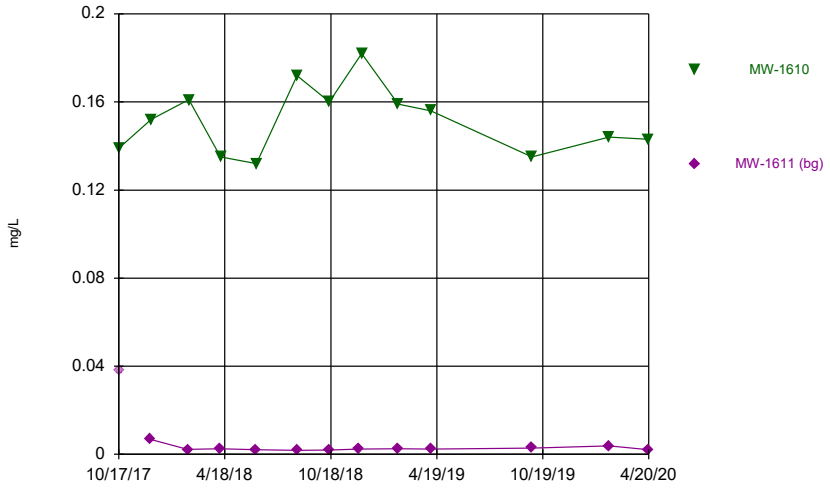
Time Series



Constituent: Mercury Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

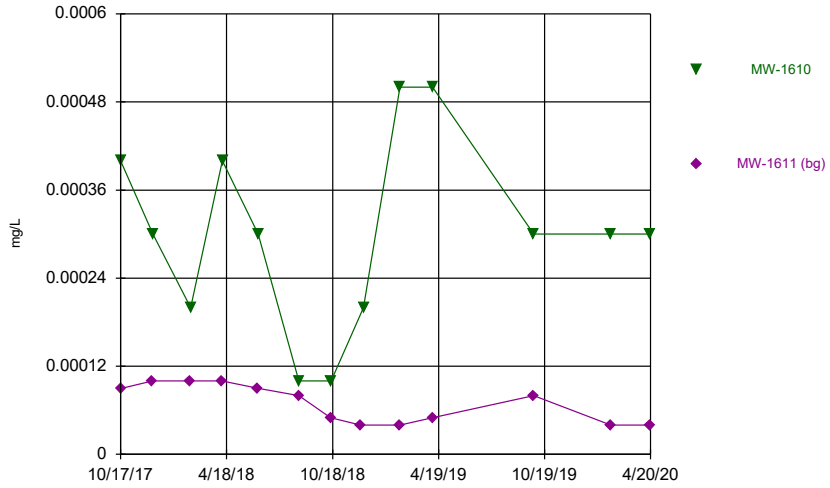
Time Series



Constituent: Molybdenum Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

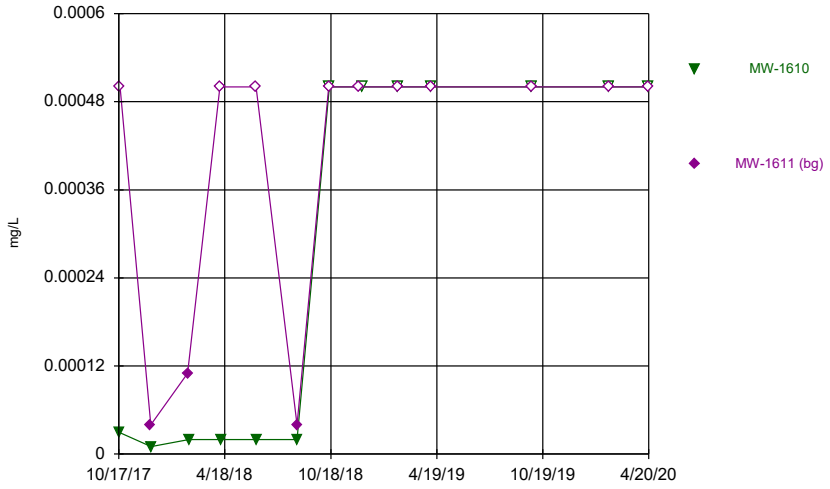
Time Series



Constituent: Selenium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

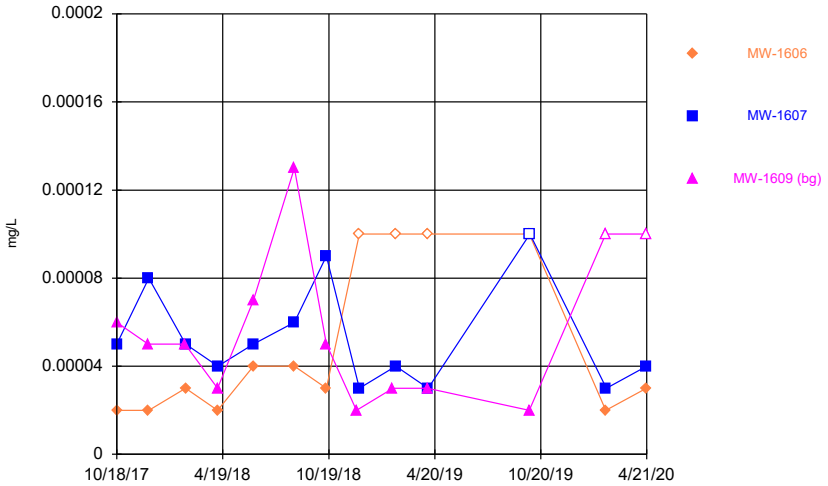
Time Series



Constituent: Thallium Analysis Run 7/9/2020 3:19 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

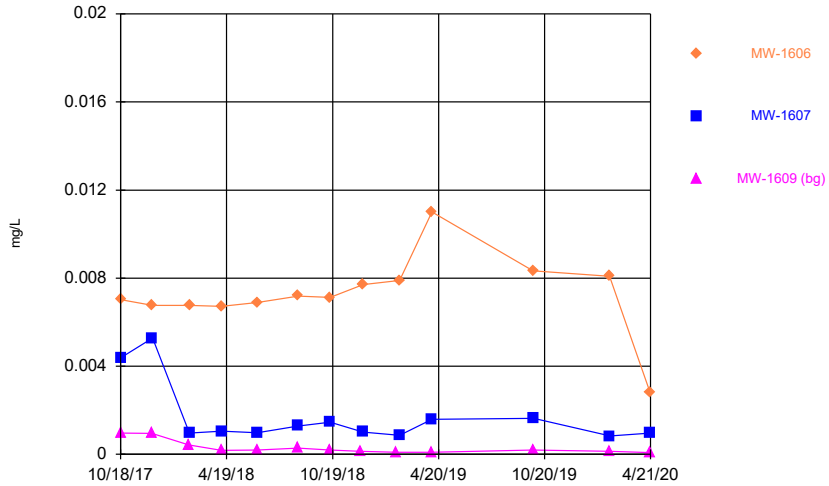
Time Series



Constituent: Antimony Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

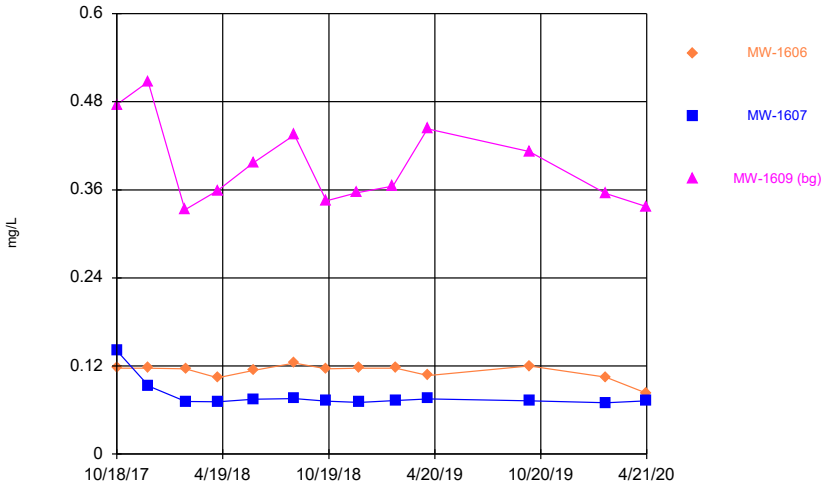
Time Series



Constituent: Arsenic Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

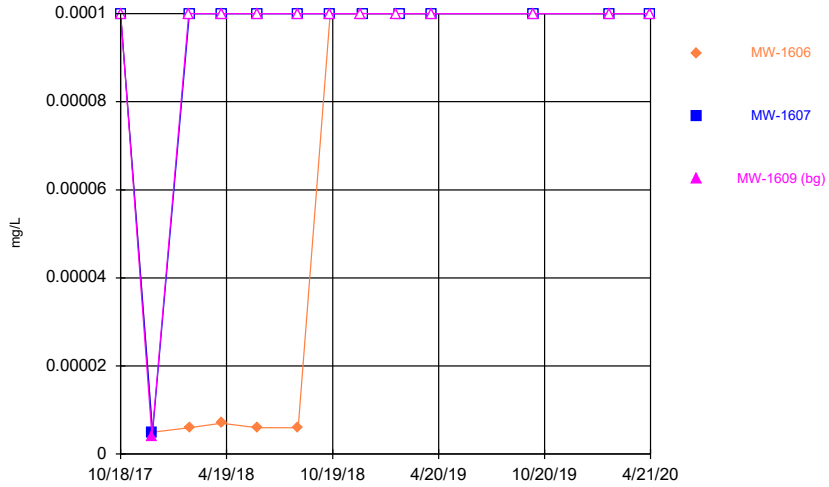
Time Series



Constituent: Barium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

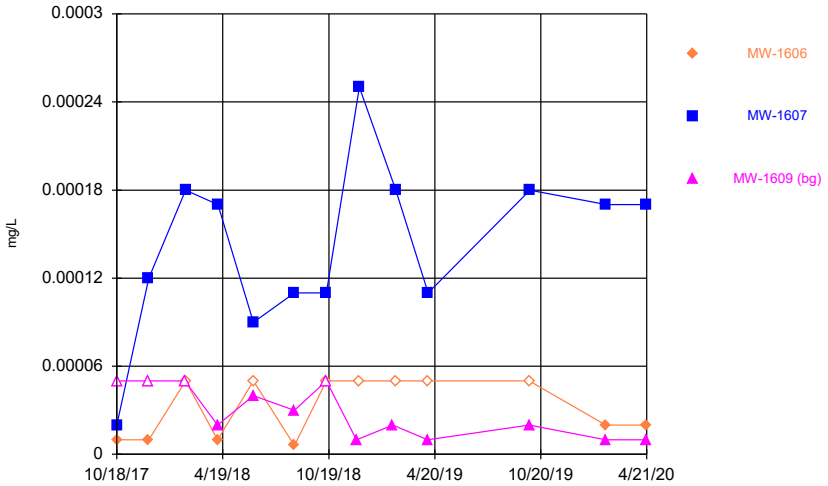
Time Series



Constituent: Beryllium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

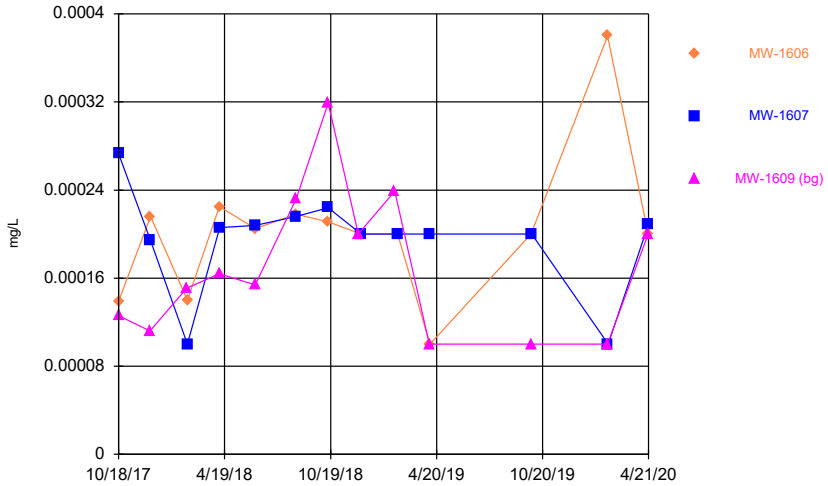
Time Series



Constituent: Cadmium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

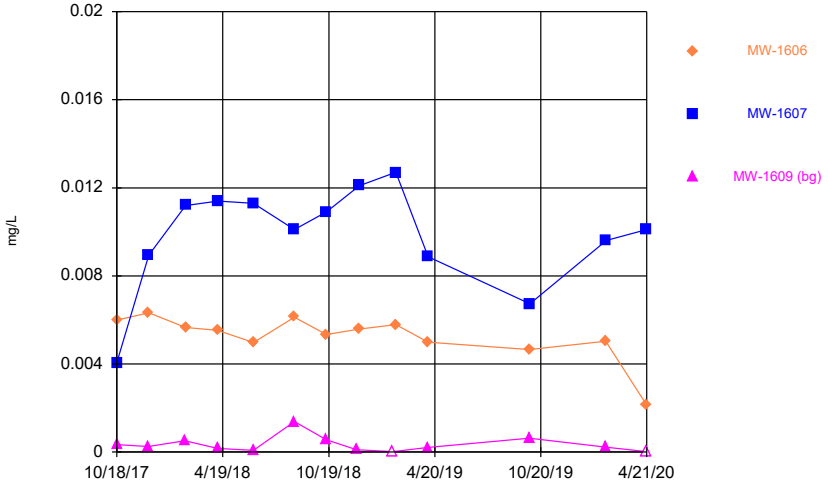
Time Series



Constituent: Chromium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

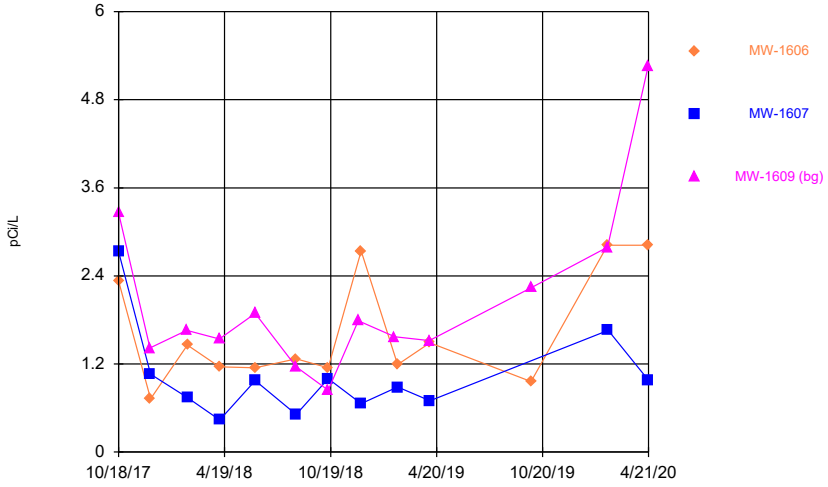
Time Series



Constituent: Cobalt Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

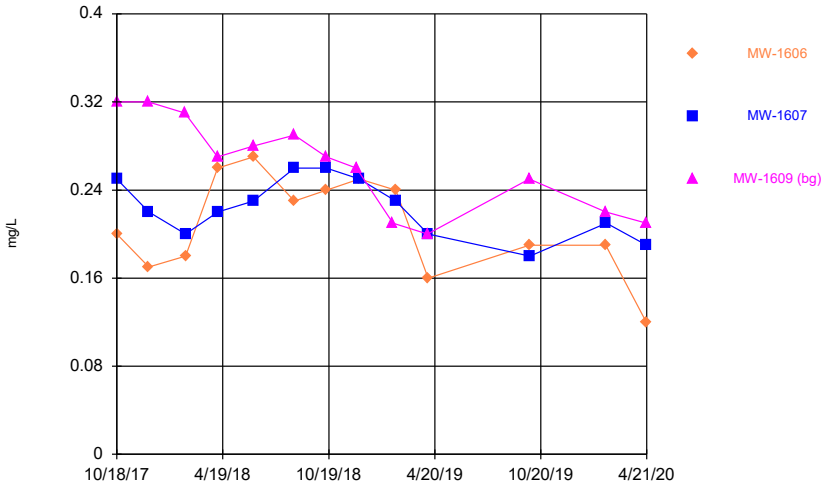
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appe
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

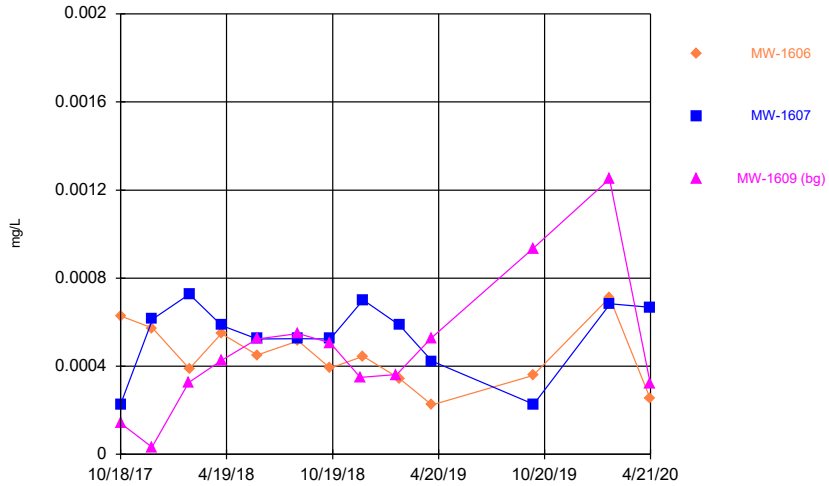
Time Series



Constituent: Fluoride Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

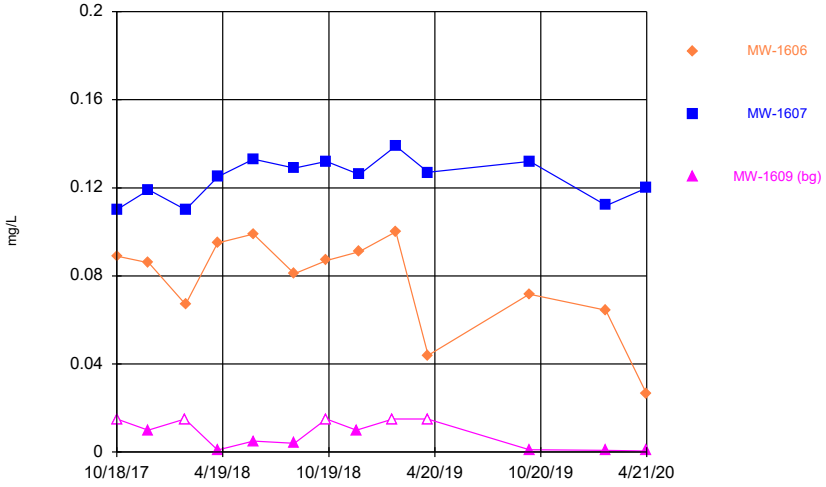
Time Series



Constituent: Lead Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

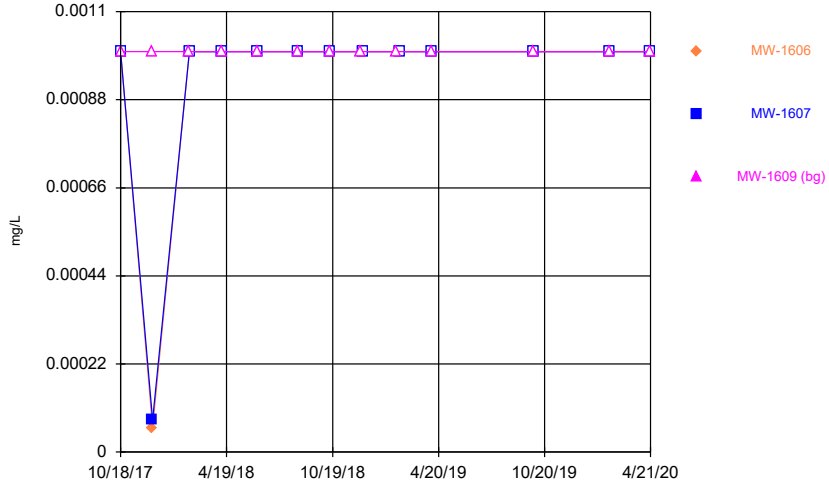
Time Series



Constituent: Lithium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

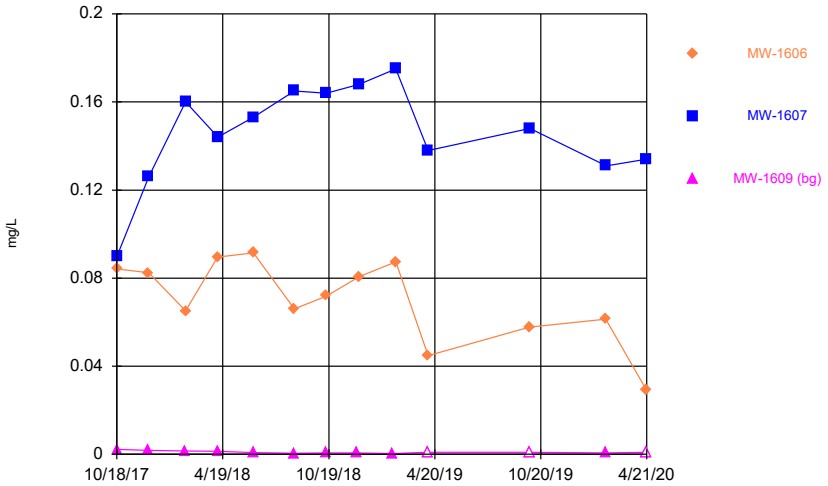
Time Series



Constituent: Mercury Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

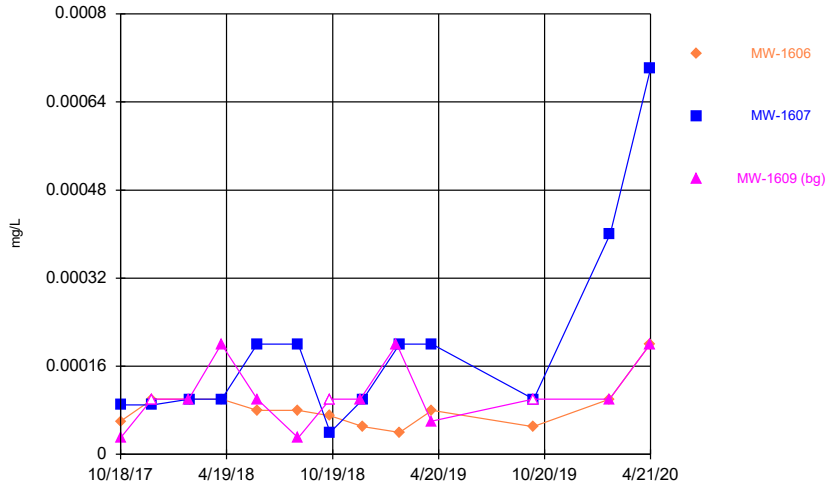
Time Series



Constituent: Molybdenum Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

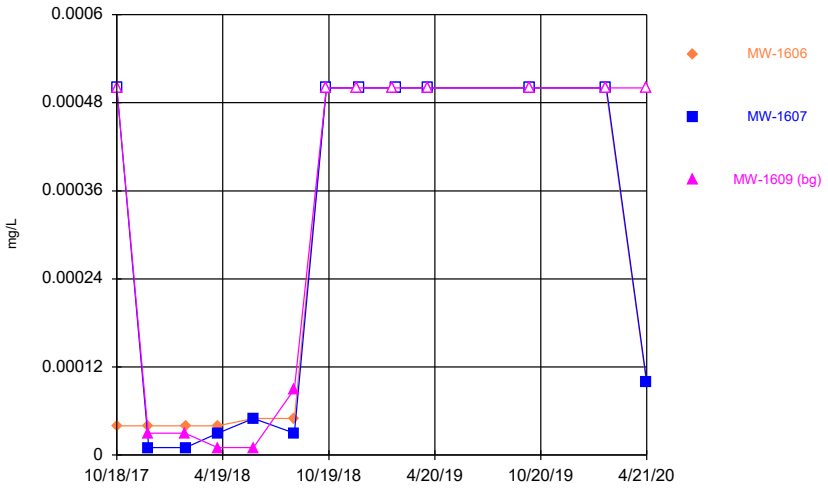
Time Series



Constituent: Selenium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

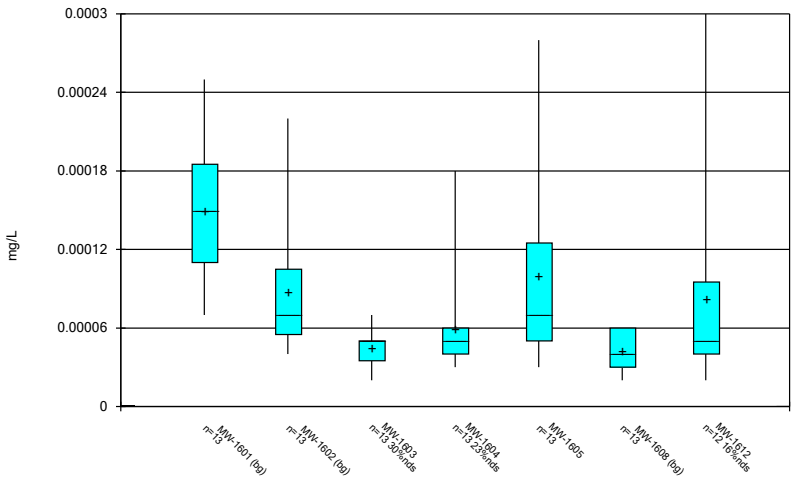
Time Series



Constituent: Thallium Analysis Run 7/9/2020 3:04 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

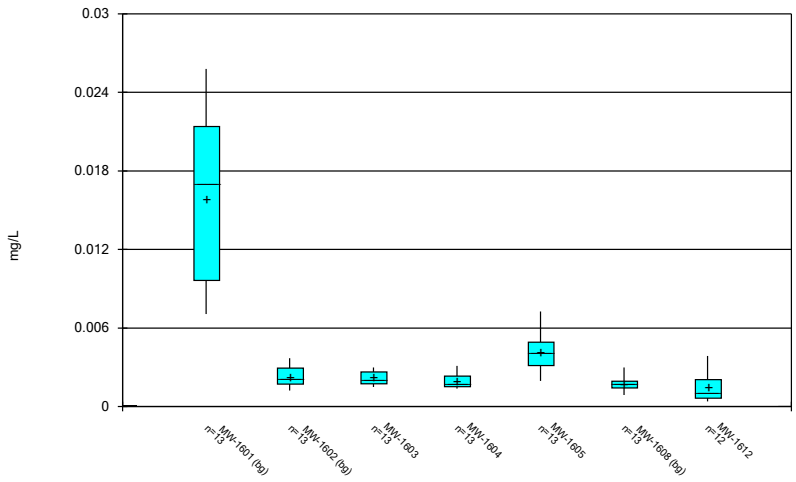
Box & Whiskers Plot



Constituent: Antimony Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

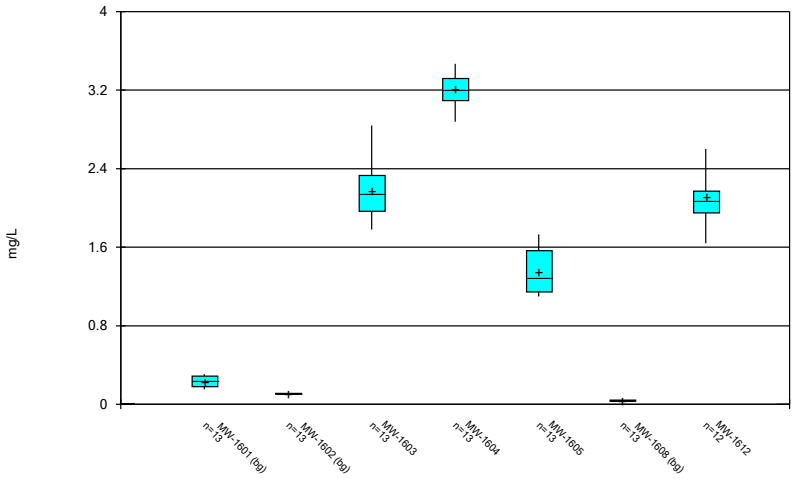
Box & Whiskers Plot



Constituent: Arsenic Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

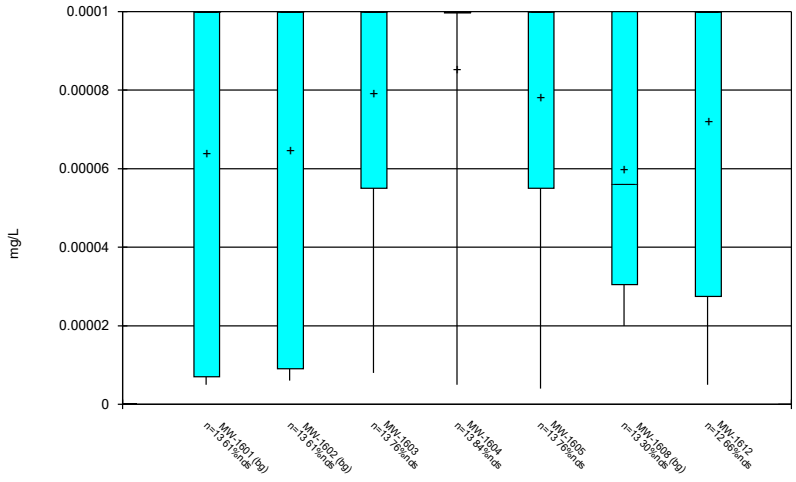
Box & Whiskers Plot



Constituent: Barium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

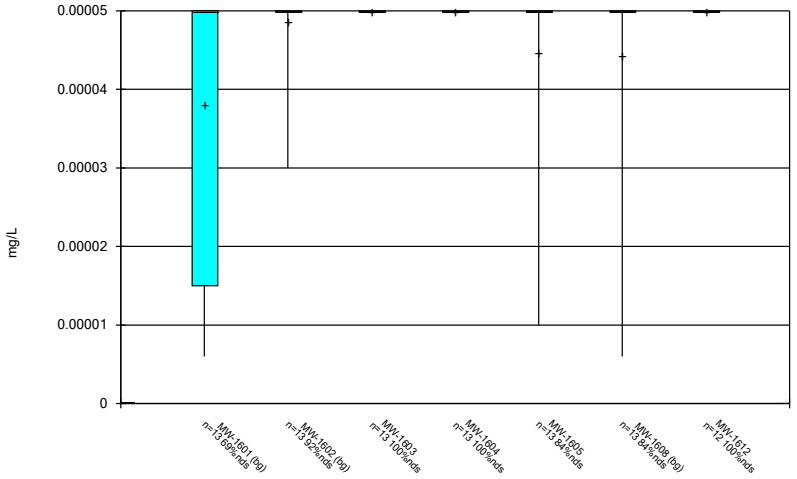
Box & Whiskers Plot



Constituent: Beryllium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

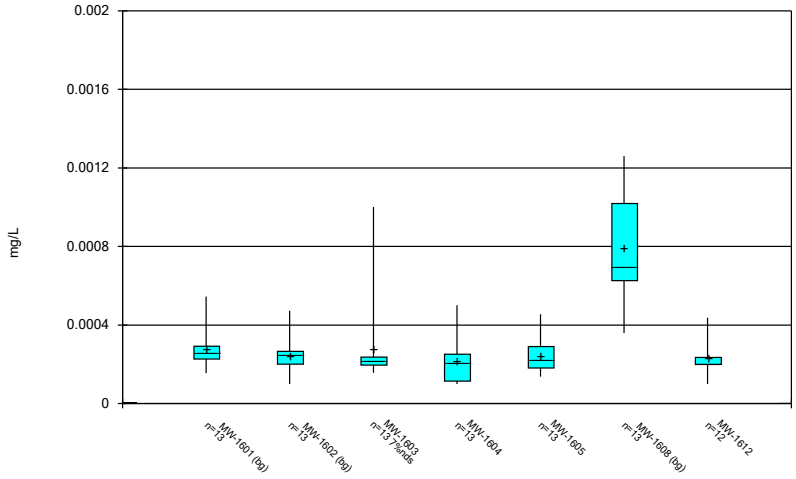
Box & Whiskers Plot



Constituent: Cadmium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

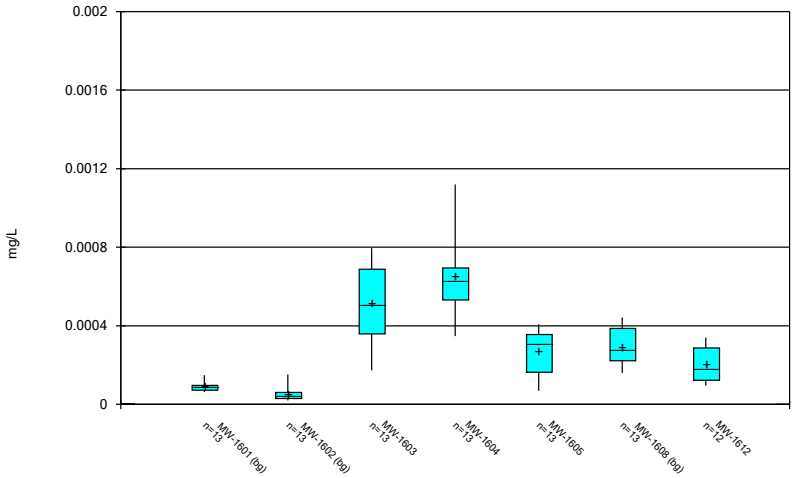
Box & Whiskers Plot



Constituent: Chromium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

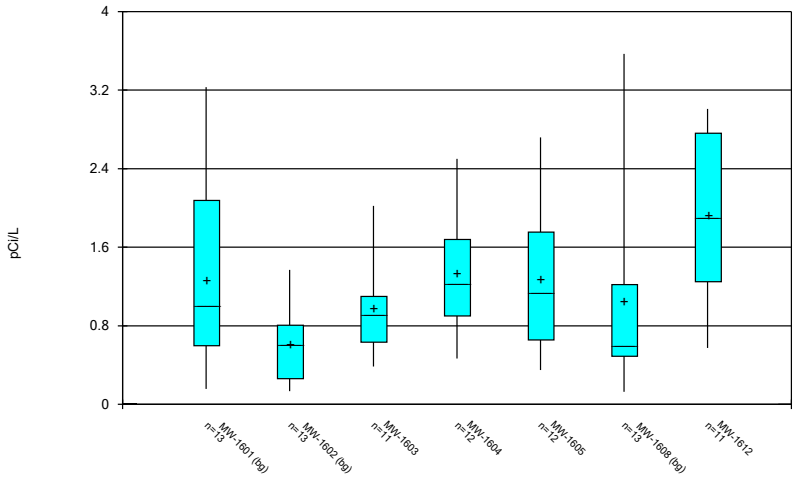
Box & Whiskers Plot



Constituent: Cobalt Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

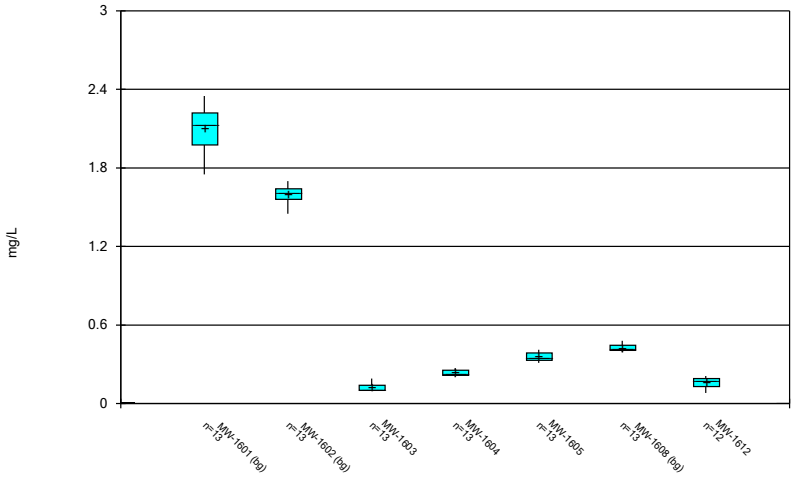
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Ap
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

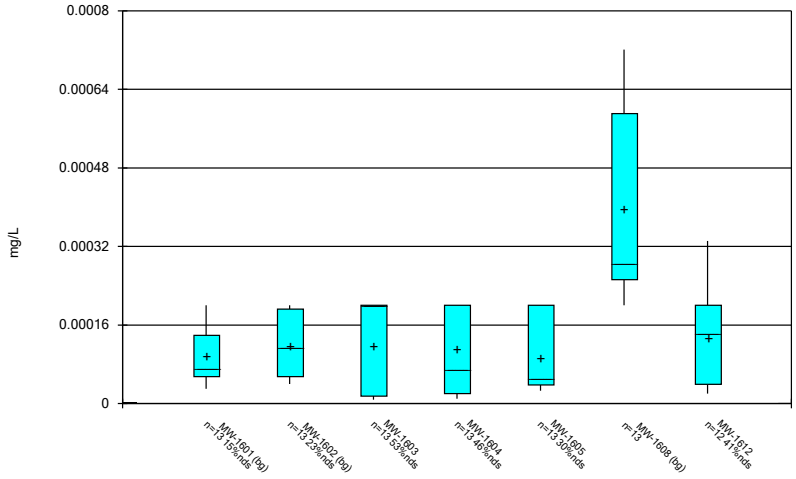
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

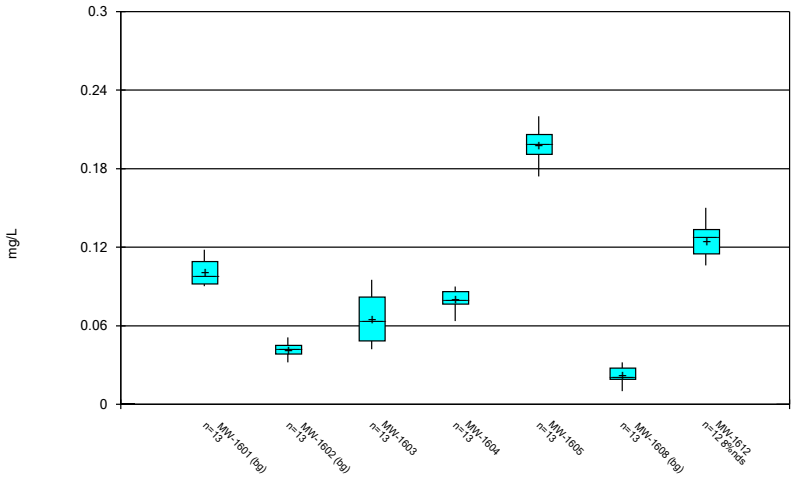
Box & Whiskers Plot



Constituent: Lead Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

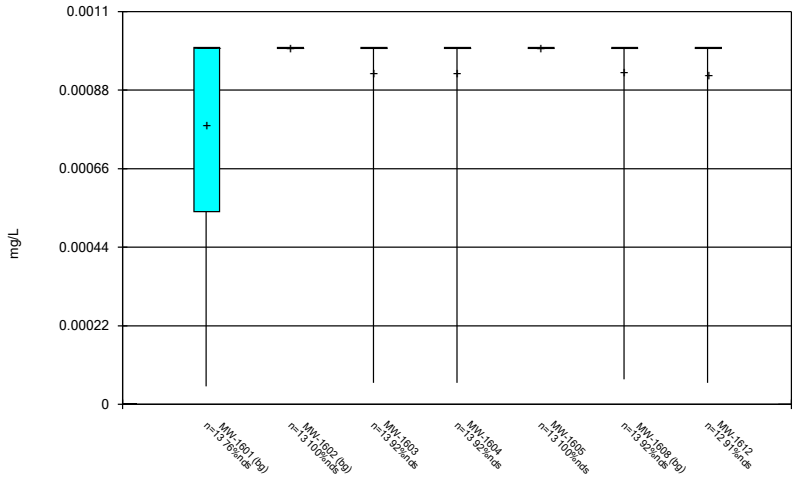
Box & Whiskers Plot



Constituent: Lithium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

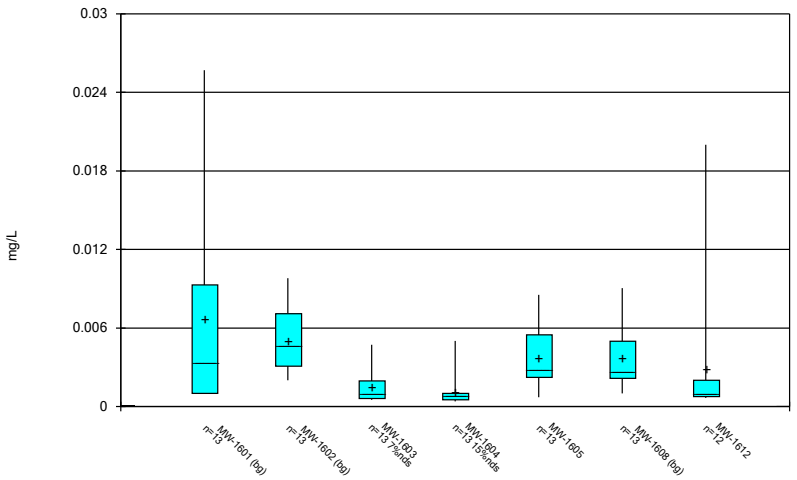
Box & Whiskers Plot



Constituent: Mercury Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

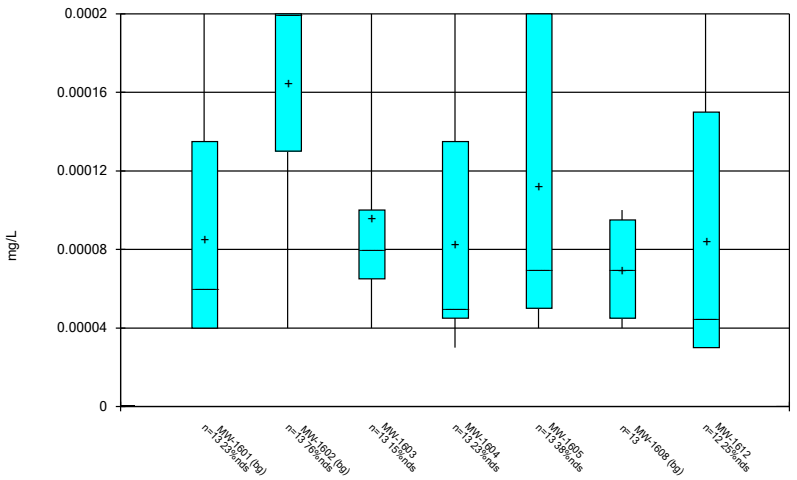
Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

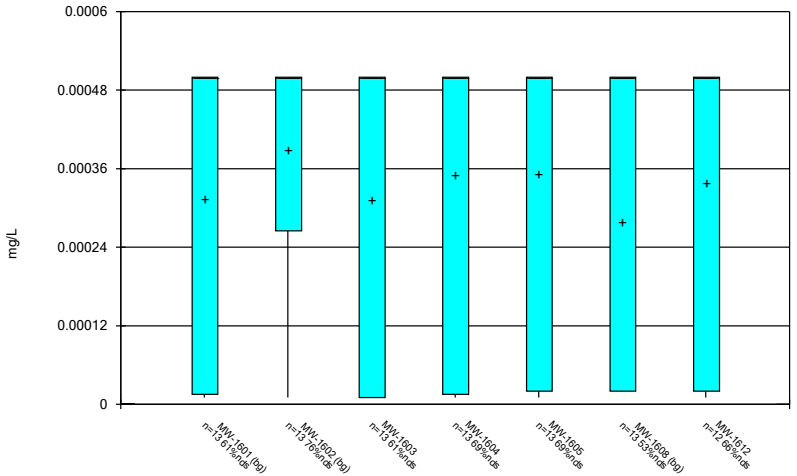
Box & Whiskers Plot



Constituent: Selenium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

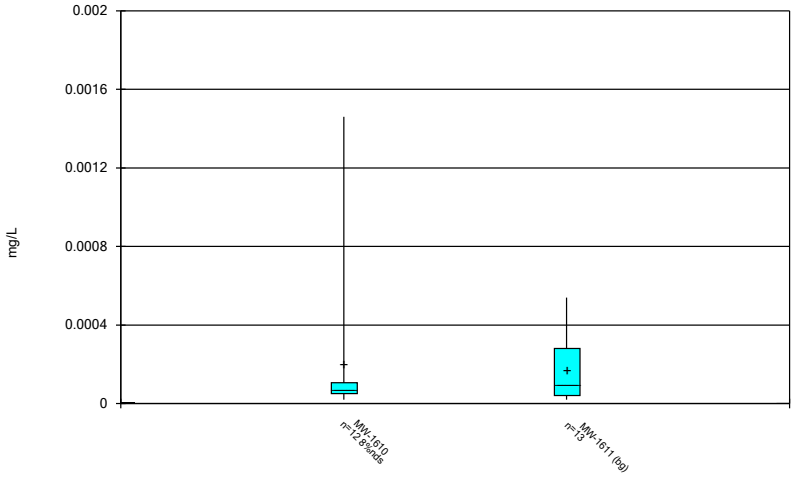
Box & Whiskers Plot



Constituent: Thallium Analysis Run 7/9/2020 2:26 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

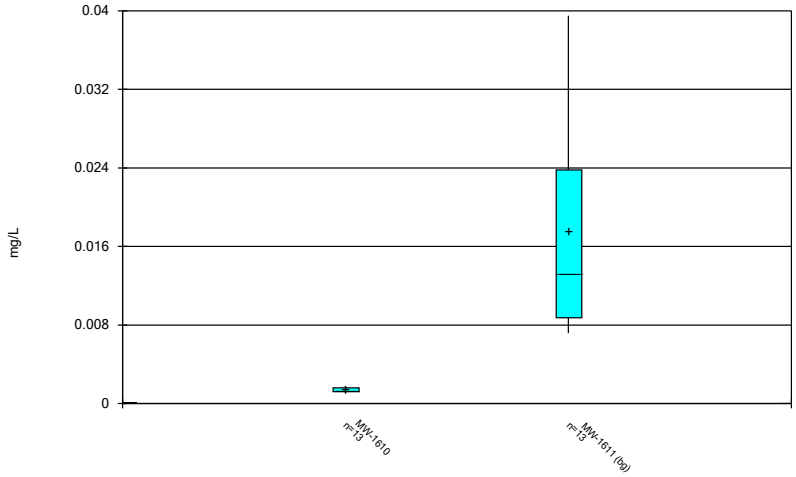
Box & Whiskers Plot



Constituent: Antimony Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

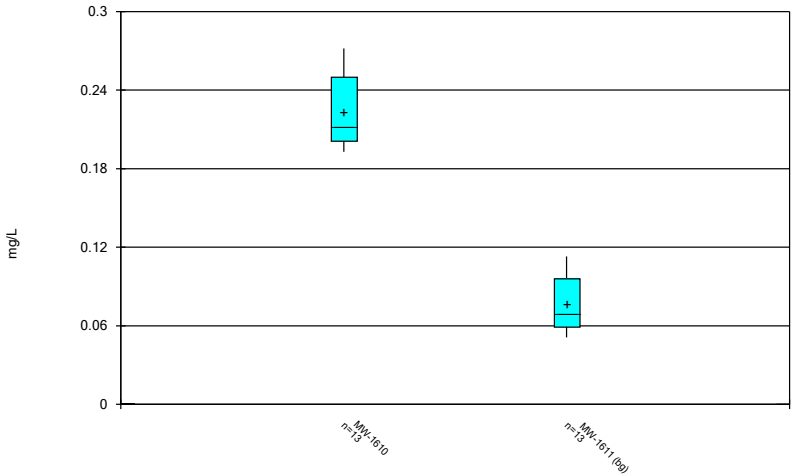
Box & Whiskers Plot



Constituent: Arsenic Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

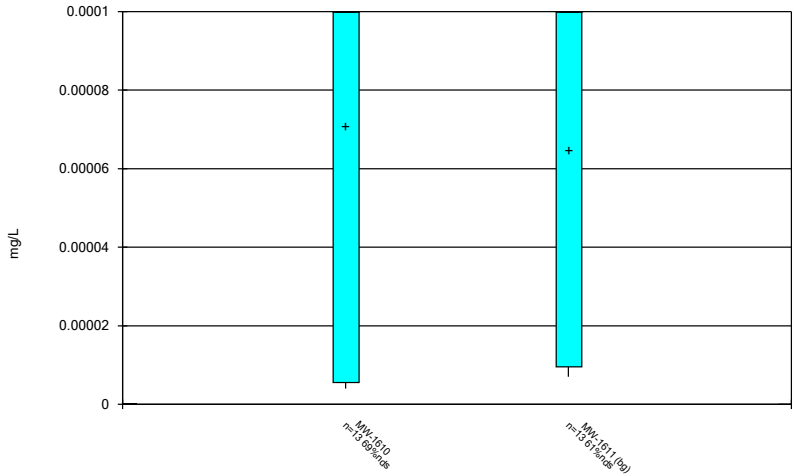
Box & Whiskers Plot



Constituent: Barium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

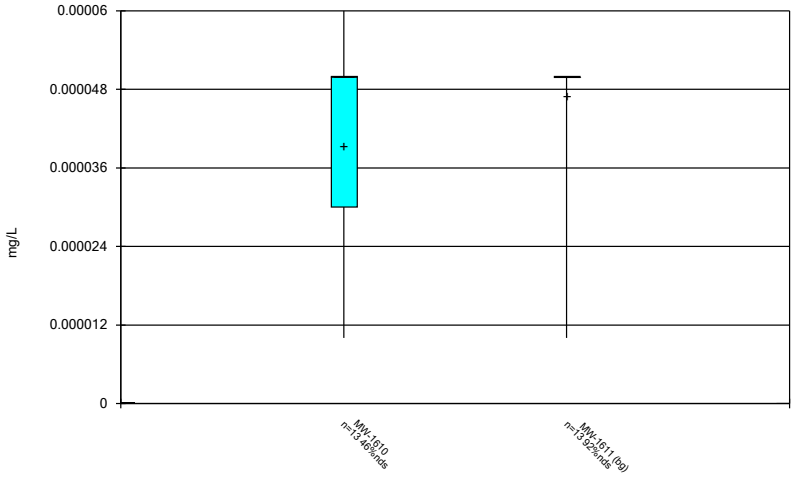
Box & Whiskers Plot



Constituent: Beryllium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

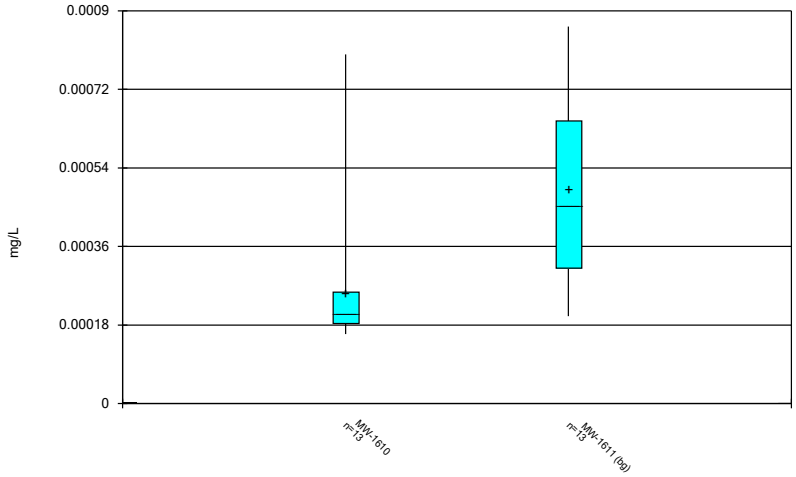
Box & Whiskers Plot



Constituent: Cadmium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

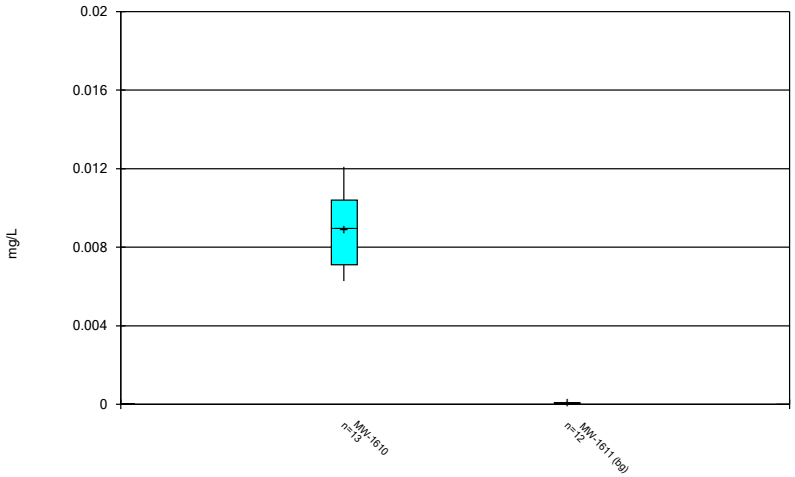
Box & Whiskers Plot



Constituent: Chromium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

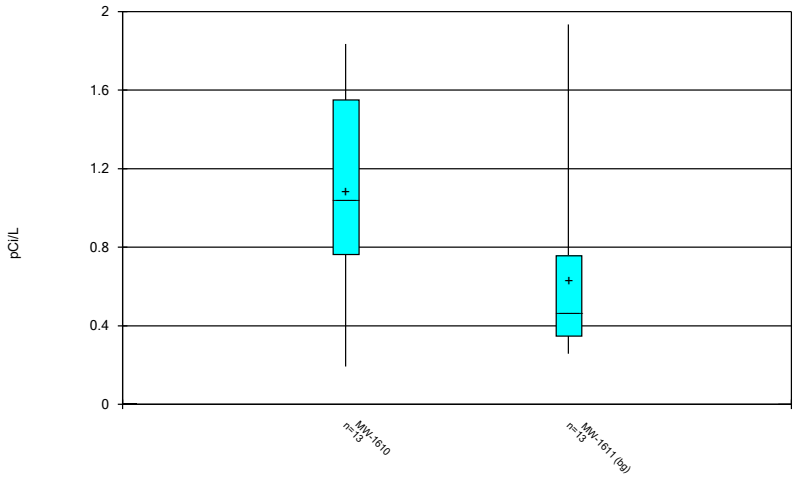
Box & Whiskers Plot



Constituent: Cobalt Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

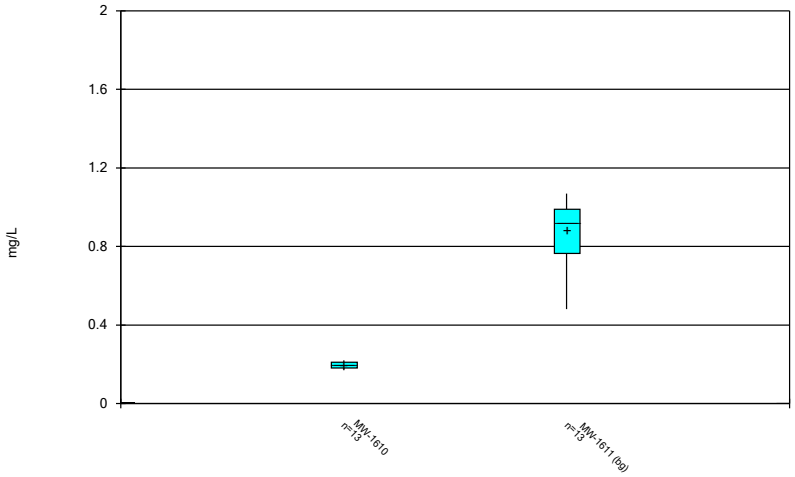
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

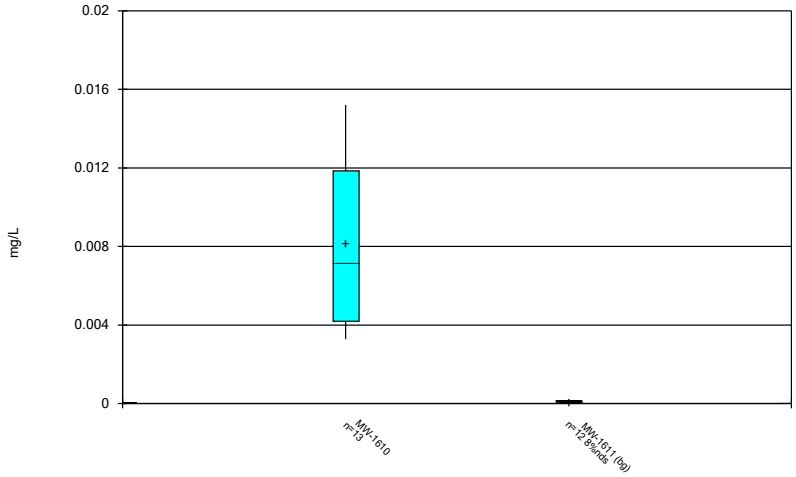
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

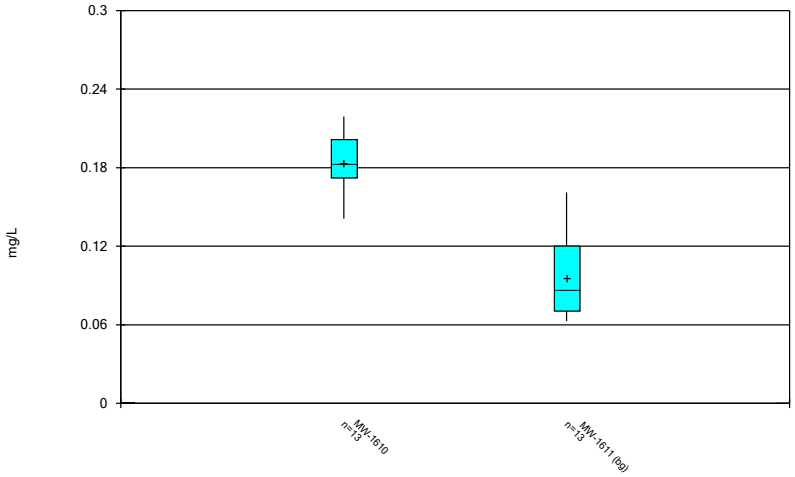
Box & Whiskers Plot



Constituent: Lead Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

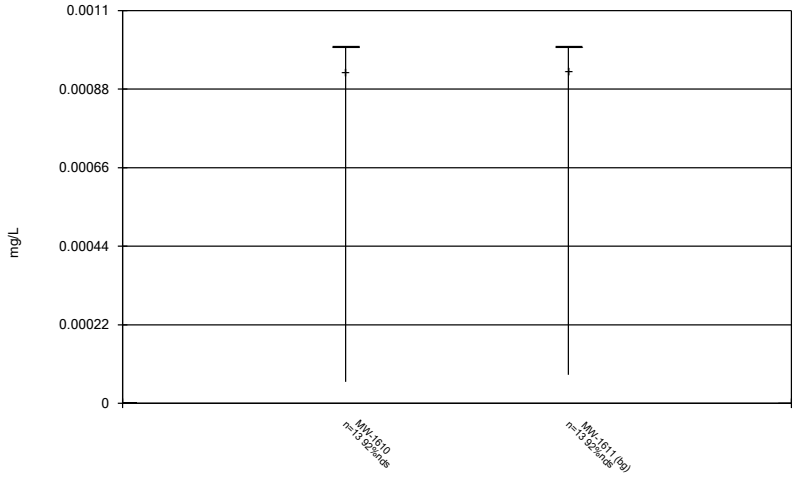
Box & Whiskers Plot



Constituent: Lithium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

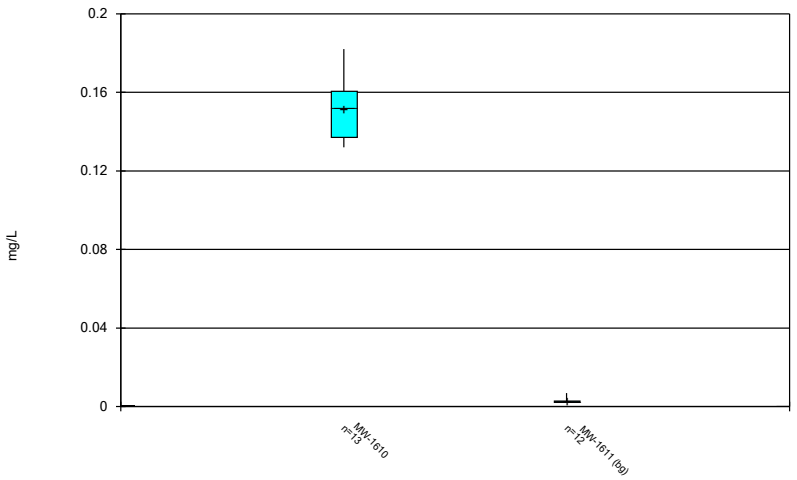
Box & Whiskers Plot



Constituent: Mercury Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

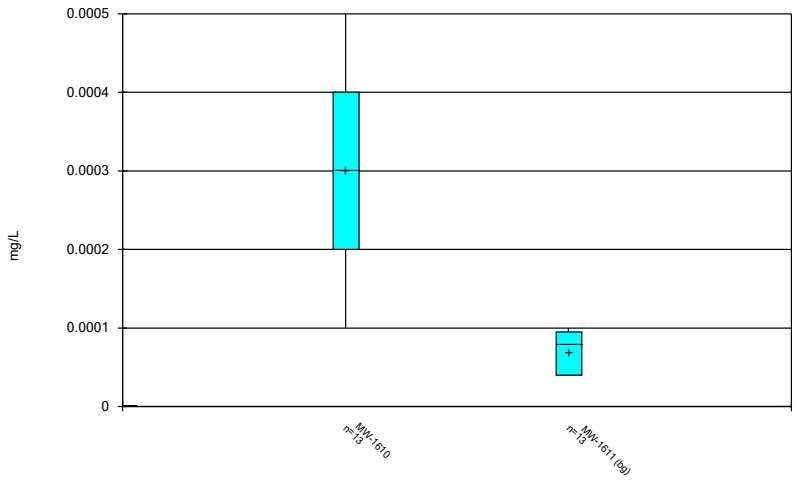
Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

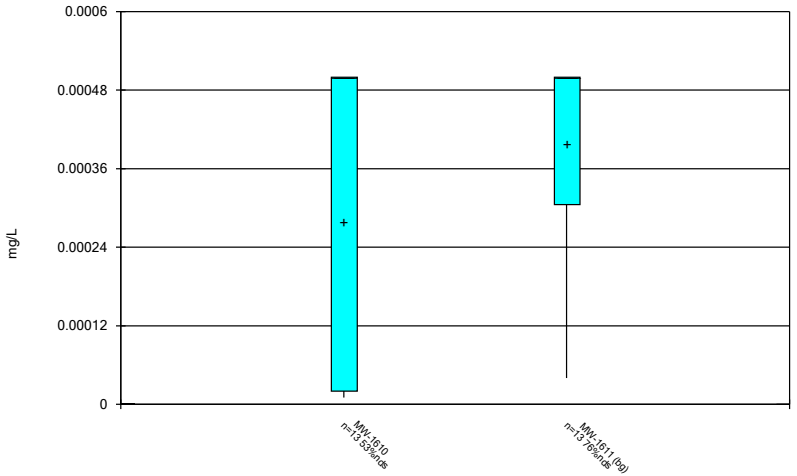
Box & Whiskers Plot



Constituent: Selenium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

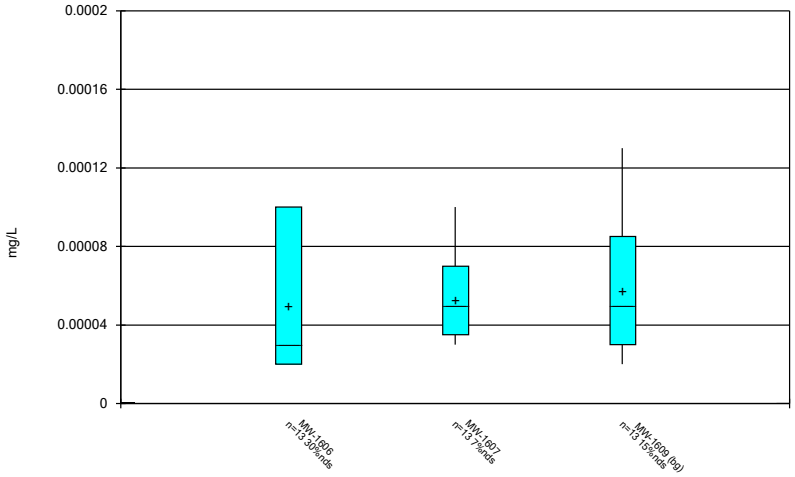
Box & Whiskers Plot



Constituent: Thallium Analysis Run 7/9/2020 3:20 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

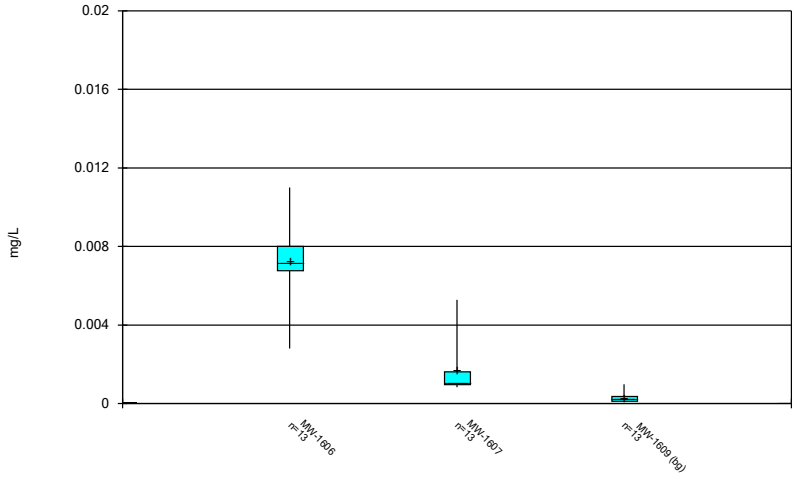
Box & Whiskers Plot



Constituent: Antimony Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

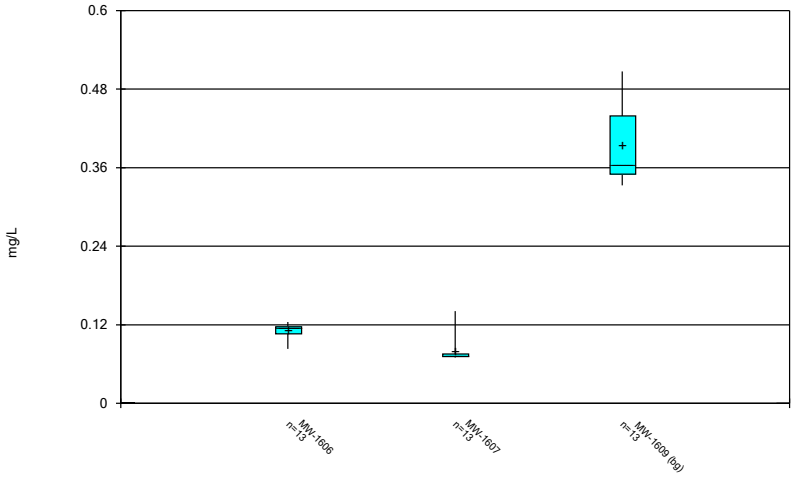
Box & Whiskers Plot



Constituent: Arsenic Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

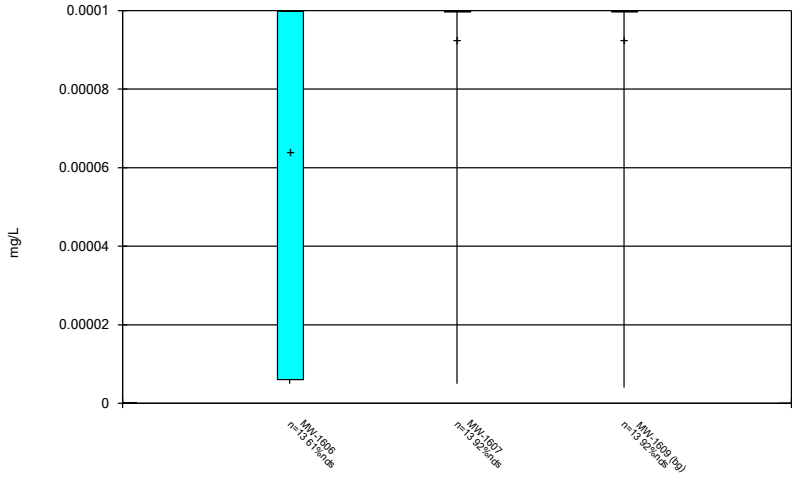
Box & Whiskers Plot



Constituent: Barium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

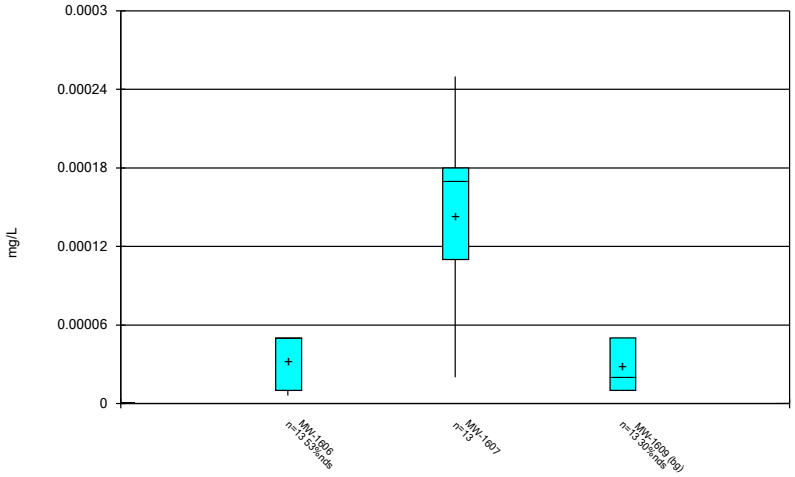
Box & Whiskers Plot



Constituent: Beryllium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

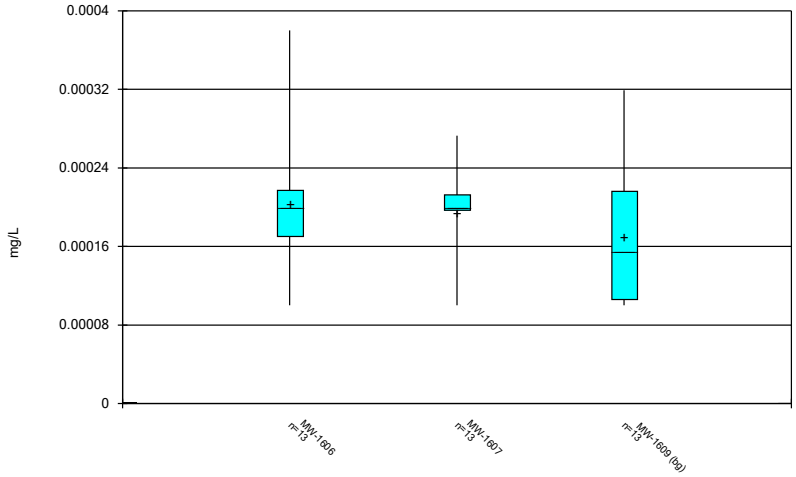
Box & Whiskers Plot



Constituent: Cadmium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

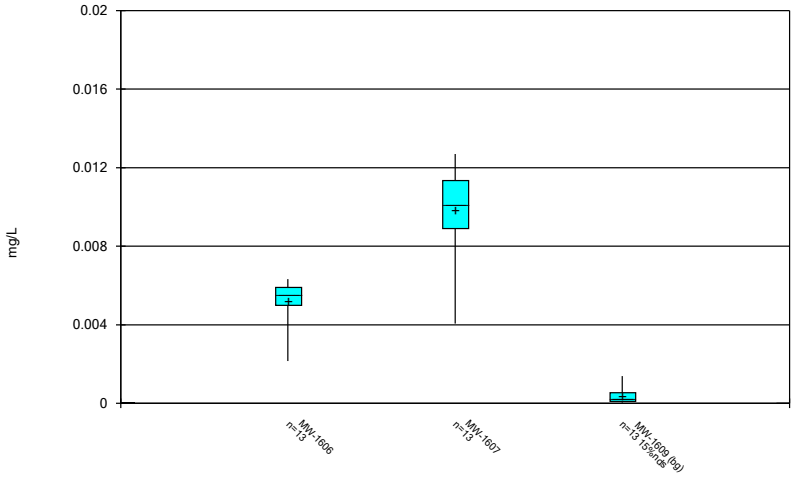
Box & Whiskers Plot



Constituent: Chromium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

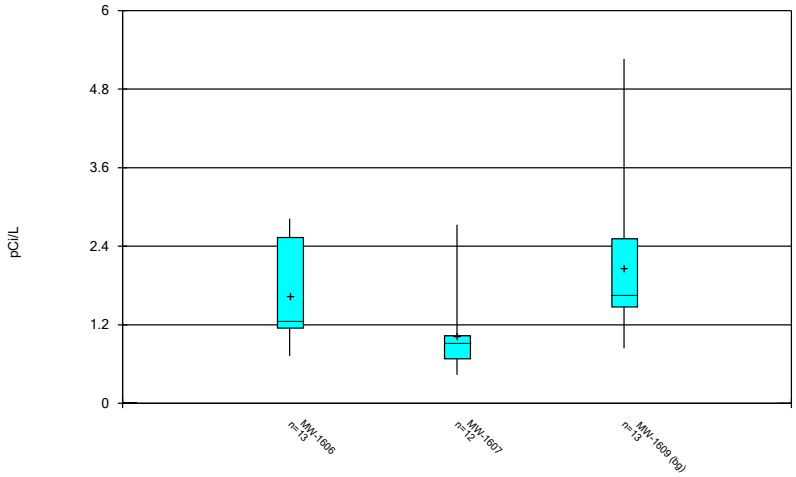
Box & Whiskers Plot



Constituent: Cobalt Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

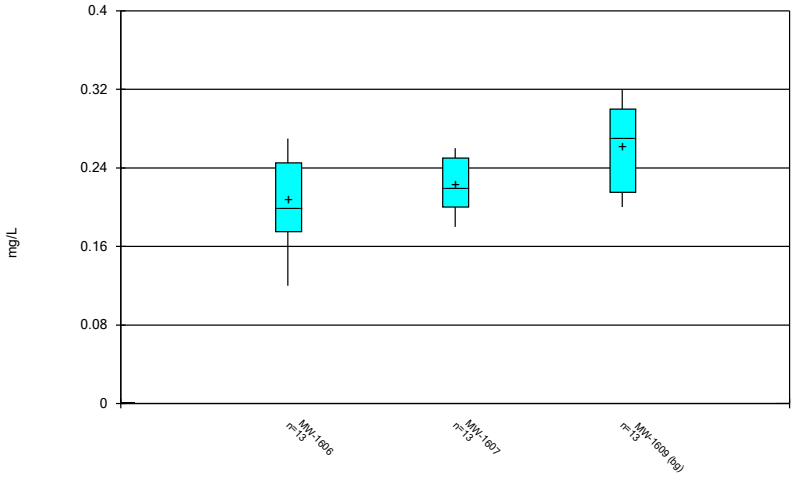
Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appe
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

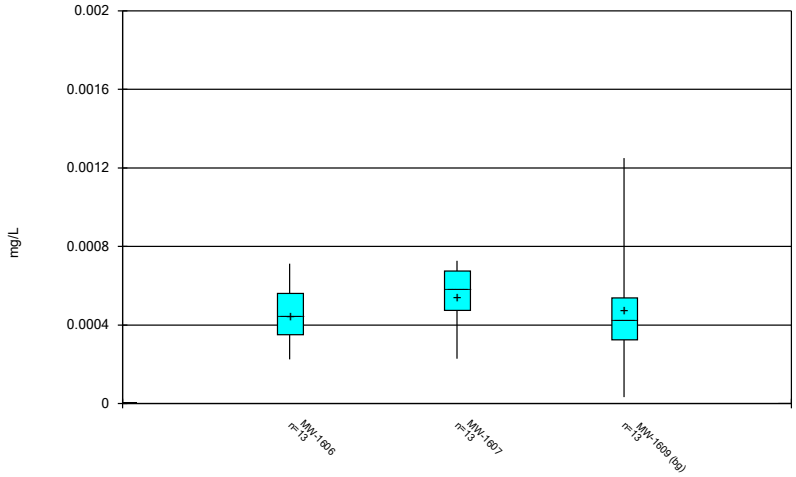
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

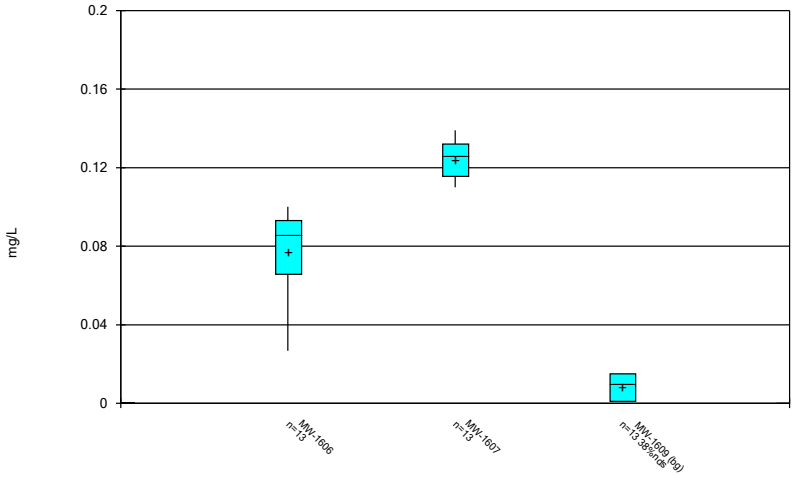
Box & Whiskers Plot



Constituent: Lead Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

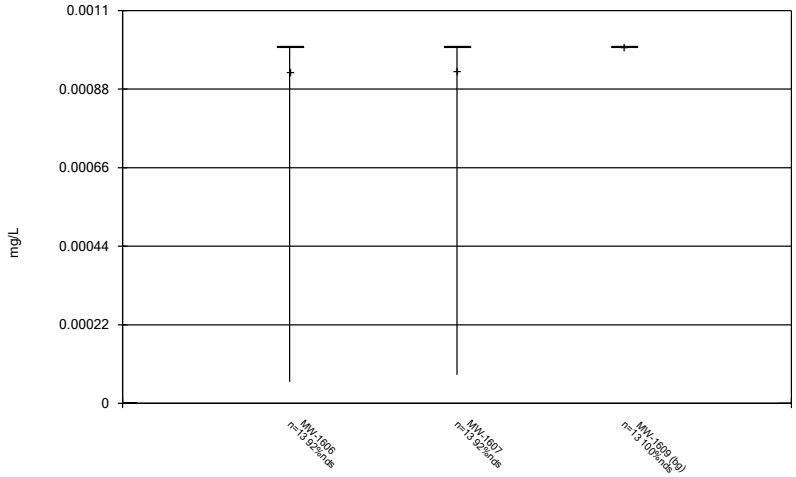
Box & Whiskers Plot



Constituent: Lithium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

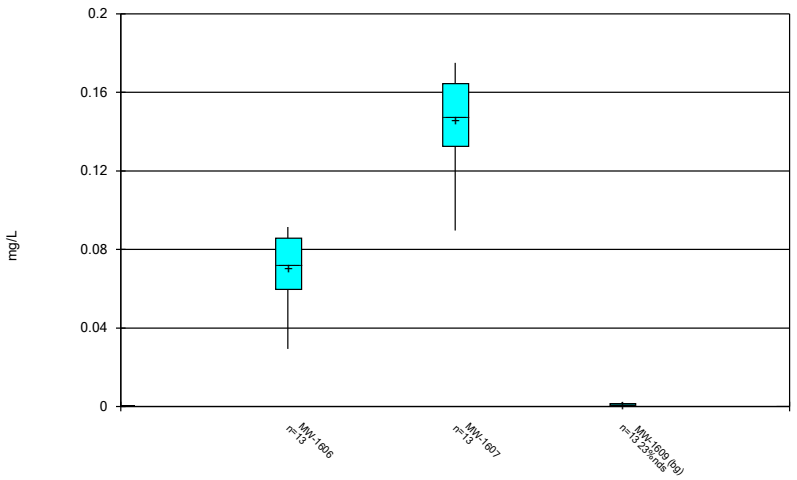
Box & Whiskers Plot



Constituent: Mercury Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

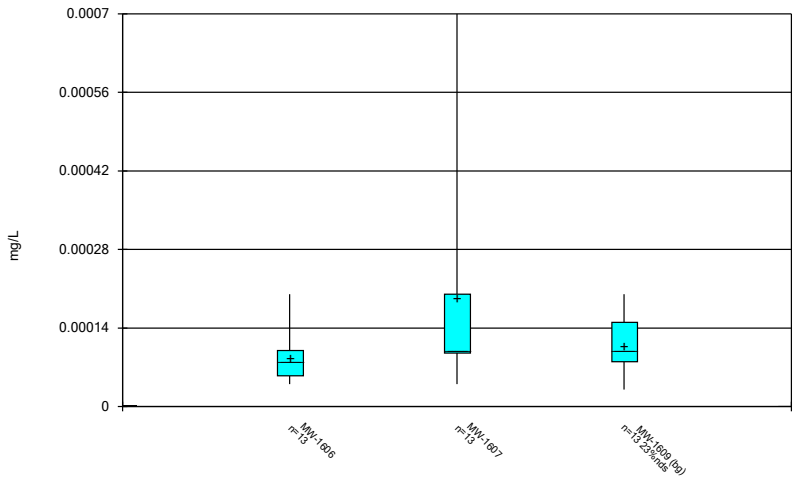
Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

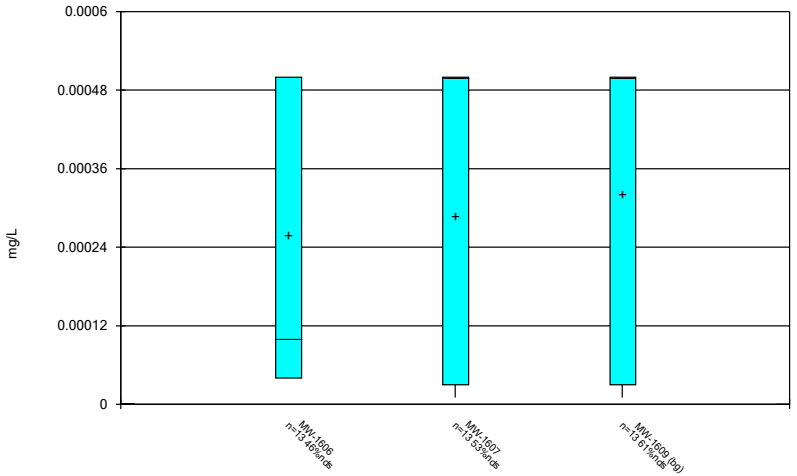
Box & Whiskers Plot



Constituent: Selenium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Thallium Analysis Run 7/9/2020 3:05 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Outlier Summary - Chattanooga Shale

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 2:27 PM

	MW-1603 Combined Radium 226 + 228 (pCi/L)
10/17/2017	3.23 (o)

Outlier Summary - Dumps Fault

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:23 PM

	MW-1610 Antimony (mg/L)	MW-1611 Cobalt (mg/L)	MW-1611 Lead (mg/L)	MW-1611 Molybdenum (mg/L)
10/17/2017	0.00022 (o)			
10/19/2017		0.000311 (o)	0.00105 (o)	0.038 (o)

Outlier Summary - Rome Limestone

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 2:56 PM

No outliers were flagged.

Chattanooga Shale - Tolerance Limit Summary Table

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 2:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.00024	n/a	n/a	n/a	n/a	39	0.009223	0.002958	0	None	sqrt(x)	0.05	Inter
Arsenic (mg/L)	n/a	0.026	n/a	n/a	n/a	n/a	39	n/a	n/a	0	n/a	n/a	0.1353	NP Inter(normality)
Barium (mg/L)	n/a	0.31	n/a	n/a	n/a	n/a	39	n/a	n/a	0	n/a	n/a	0.1353	NP Inter(normality)
Beryllium (mg/L)	n/a	0.00010	n/a	n/a	n/a	n/a	39	n/a	n/a	51.28	n/a	n/a	0.1353	NP Inter(NDs)
Cadmium (mg/L)	n/a	0.000050	n/a	n/a	n/a	n/a	39	n/a	n/a	82.05	n/a	n/a	0.1353	NP Inter(NDs)
Chromium (mg/L)	n/a	0.0014	n/a	n/a	n/a	n/a	39	-7.941	0.6303	0	None	ln(x)	0.05	Inter
Cobalt (mg/L)	n/a	0.00049	n/a	n/a	n/a	n/a	39	0.0486	0.01407	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	3	n/a	n/a	n/a	n/a	39	0.9159	0.3821	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	n/a	2.4	n/a	n/a	n/a	n/a	39	n/a	n/a	0	n/a	n/a	0.1353	NP Inter(normality)
Lead (mg/L)	n/a	0.0008	n/a	n/a	n/a	n/a	39	-8.935	0.8437	12.82	None	ln(x)	0.05	Inter
Lithium (mg/L)	n/a	0.19	n/a	n/a	n/a	n/a	39	-3.106	0.6654	0	None	ln(x)	0.05	Inter
Mercury (mg/L)	n/a	0.0010	n/a	n/a	n/a	n/a	39	n/a	n/a	89.74	n/a	n/a	0.1353	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.02	n/a	n/a	n/a	n/a	39	-5.598	0.7893	0	None	ln(x)	0.05	Inter
Selenium (mg/L)	n/a	0.00020	n/a	n/a	n/a	n/a	39	n/a	n/a	33.33	n/a	n/a	0.1353	NP Inter(normality)
Thallium (mg/L)	n/a	0.00050	n/a	n/a	n/a	n/a	39	n/a	n/a	64.1	n/a	n/a	0.1353	NP Inter(NDs)

Dumps Fault - Tolerance Limit Summary Table

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.00083	n/a	n/a	n/a	n/a	13	0.01169	0.006422	0	None	sqrt(x)	0.05	Inter
Arsenic (mg/L)	n/a	0.046	n/a	n/a	n/a	n/a	13	0.01752	0.01083	0	None	No	0.05	Inter
Barium (mg/L)	n/a	0.13	n/a	n/a	n/a	n/a	13	0.07625	0.02162	0	None	No	0.05	Inter
Beryllium (mg/L)	n/a	0.00010	n/a	n/a	n/a	n/a	13	n/a	n/a	61.54	n/a	n/a	0.5133	NP Inter(NDs)
Cadmium (mg/L)	n/a	0.000050	n/a	n/a	n/a	n/a	13	n/a	n/a	92.31	n/a	n/a	0.5133	NP Inter(NDs)
Chromium (mg/L)	n/a	0.0011	n/a	n/a	n/a	n/a	13	0.0004915	0.0002174	0	None	No	0.05	Inter
Cobalt (mg/L)	n/a	0.00016	n/a	n/a	n/a	n/a	12	0.00007008	0.00003292	0	None	No	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.1	n/a	n/a	n/a	n/a	13	0.7558	0.2579	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	n/a	1.3	n/a	n/a	n/a	n/a	13	0.8815	0.1737	0	None	No	0.05	Inter
Lead (mg/L)	n/a	0.00022	n/a	n/a	n/a	n/a	12	0.0001111	0.00003858	8.333	None	No	0.05	Inter
Lithium (mg/L)	n/a	0.18	n/a	n/a	n/a	n/a	13	0.09572	0.03021	0	None	No	0.05	Inter
Mercury (mg/L)	n/a	0.0010	n/a	n/a	n/a	n/a	13	n/a	n/a	92.31	n/a	n/a	0.5133	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.0068	n/a	n/a	n/a	n/a	12	n/a	n/a	0	n/a	n/a	0.5404	NP Inter(normality)
Selenium (mg/L)	n/a	0.00012	n/a	n/a	n/a	n/a	13	5.4e-9	3.6e-9	0	None	x^2	0.05	Inter
Thallium (mg/L)	n/a	0.00050	n/a	n/a	n/a	n/a	13	n/a	n/a	76.92	n/a	n/a	0.5133	NP Inter(NDs)

Rome Limestone - Tolerance Limit Summary Table

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:08 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.00012	n/a	n/a	n/a	n/a	13	0.00004083	0.00003117	15.38	Kaplan-Meier	No	0.05	Inter
Arsenic (mg/L)	n/a	0.0014	n/a	n/a	n/a	n/a	13	0.06197	0.01836	0	None	x^(1/3)	0.05	Inter
Barium (mg/L)	n/a	0.54	n/a	n/a	n/a	n/a	13	0.3938	0.0565	0	None	No	0.05	Inter
Beryllium (mg/L)	n/a	0.00010	n/a	n/a	n/a	n/a	13	n/a	n/a	92.31	n/a	n/a	0.5133	NP Inter(NDs)
Cadmium (mg/L)	n/a	0.000041	n/a	n/a	n/a	n/a	13	0.000015	0.000009574	30.77	Kaplan-Meier	No	0.05	Inter
Chromium (mg/L)	n/a	0.00035	n/a	n/a	n/a	n/a	13	0.000169	0.00006661	0	None	No	0.05	Inter
Cobalt (mg/L)	n/a	0.0015	n/a	n/a	n/a	n/a	13	0.01688	0.008232	15.38	Kaplan-Meier	sqrt(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	5.5	n/a	n/a	n/a	n/a	13	1.398	0.3556	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	n/a	0.38	n/a	n/a	n/a	n/a	13	0.2623	0.04226	0	None	No	0.05	Inter
Lead (mg/L)	n/a	0.0013	n/a	n/a	n/a	n/a	13	0.000481	0.000317	0	None	No	0.05	Inter
Lithium (mg/L)	n/a	0.012	n/a	n/a	n/a	n/a	13	0.04396	0.02481	38.46	Kaplan-Meier	sqrt(x)	0.05	Inter
Mercury (mg/L)	n/a	0.0010	n/a	n/a	n/a	n/a	13	n/a	n/a	100	n/a	n/a	0.5133	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.0026	n/a	n/a	n/a	n/a	13	0.0009687	0.0006111	23.08	Kaplan-Meier	No	0.05	Inter
Selenium (mg/L)	n/a	0.00020	n/a	n/a	n/a	n/a	13	n/a	n/a	23.08	n/a	n/a	0.5133	NP Inter(normality)
Thallium (mg/L)	n/a	0.00050	n/a	n/a	n/a	n/a	13	n/a	n/a	61.54	n/a	n/a	0.5133	NP Inter(NDs)

CLINCH RIVER GWPS - CHATTANOOGA SHALE				
Constituent Name	**MCL**	**CCR Rule Specified**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006		0.00024	0.006
Arsenic, Total (mg/L)	0.01		0.026	0.026
Barium, Total (mg/L)	2		0.31	2
Beryllium, Total (mg/L)	0.004		0.0001	0.004
Cadmium, Total (mg/L)	0.005		0.00005	0.005
Chromium, Total (mg/L)	0.1		0.0014	0.1
Cobalt, Total (mg/L)		0.006	0.00049	0.006
Combined Radium, Total (pCi/L)	5		3	5
Fluoride, Total (mg/L)	4		2.4	4
Lead, Total (mg/L)		0.015	0.0008	0.015
Lithium, Total (mg/L)		0.04	0.19	0.19
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.02	0.1
Selenium, Total (mg/L)	0.05		0.0002	0.05
Thallium, Total (mg/L)	0.002		0.0005	0.002

**Grey cell indicates background is higher than MCL.*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - DUMPS FAULT				
Constituent Name	**MCL**	**CCR Rule Specified**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006		0.00083	0.006
Arsenic, Total (mg/L)	0.01		0.046	0.046
Barium, Total (mg/L)	2		0.13	2
Beryllium, Total (mg/L)	0.004		0.0001	0.004
Cadmium, Total (mg/L)	0.005		0.00005	0.005
Chromium, Total (mg/L)	0.1		0.0011	0.1
Cobalt, Total (mg/L)		0.006	0.00016	0.006
Combined Radium, Total (pCi/L)	5		2.1	5
Fluoride, Total (mg/L)	4		1.3	4
Lead, Total (mg/L)		0.015	0.00022	0.015
Lithium, Total (mg/L)		0.04	0.18	0.18
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0068	0.1
Selenium, Total (mg/L)	0.05		0.00012	0.05
Thallium, Total (mg/L)	0.002		0.0005	0.002

**Grey cell indicates background is higher than MCL.*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - ROME LIMESTONE				
Constituent Name	**MCL**	**CCR Rule Specified**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006		0.00012	0.006
Arsenic, Total (mg/L)	0.01		0.0014	0.01
Barium, Total (mg/L)	2		0.54	2
Beryllium, Total (mg/L)	0.004		0.0001	0.004
Cadmium, Total (mg/L)	0.005		0.000041	0.005
Chromium, Total (mg/L)	0.1		0.00035	0.1
Cobalt, Total (mg/L)		0.006	0.0015	0.006
Combined Radium, Total (pCi/L)	5		5.5	5.5
Fluoride, Total (mg/L)	4		0.38	4
Lead, Total (mg/L)		0.015	0.0013	0.015
Lithium, Total (mg/L)		0.04	0.012	0.04
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0026	0.1
Selenium, Total (mg/L)	0.05		0.0002	0.05
Thallium, Total (mg/L)	0.002		0.0005	0.002

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

Confidence Intervals - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 2:52 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Barium (mg/L)	**MW-1604**	**3.319**	**3.087**	**2**	**Yes**	**13**	**3.203**	**0.1563**	**0**	**None**	**No**	**0.01**	**Param.**

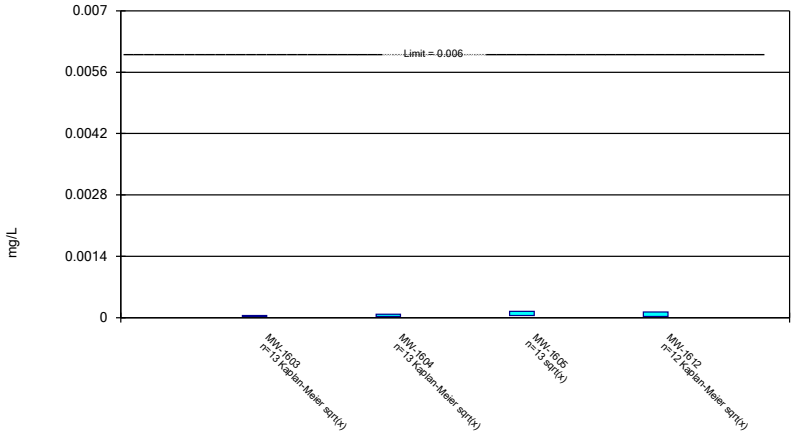
Confidence Intervals - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 2:52 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	MW-1603	0.00004906	0.00002396	0.006	No	13	0.00006	0.00003055	30.77	Kaplan-Meier	sqrt(x)	0.01	Param.
Antimony (mg/L)	MW-1604	0.00007678	0.00002909	0.006	No	13	0.00007077	0.00004192	23.08	Kaplan-Meier	sqrt(x)	0.01	Param.
Antimony (mg/L)	MW-1605	0.0001423	0.00004975	0.006	No	13	0.0001	0.00007269	0	None	sqrt(x)	0.01	Param.
Antimony (mg/L)	MW-1612	0.0001248	0.00002678	0.006	No	12	0.00009083	0.00007633	16.67	Kaplan-Meier	sqrt(x)	0.01	Param.
Arsenic (mg/L)	MW-1603	0.002532	0.00179	0.026	No	13	0.002161	0.0004989	0	None	No	0.01	Param.
Arsenic (mg/L)	MW-1604	0.002383	0.001521	0.026	No	13	0.001952	0.0005795	0	None	No	0.01	Param.
Arsenic (mg/L)	MW-1605	0.005212	0.003125	0.026	No	13	0.004168	0.001404	0	None	No	0.01	Param.
Arsenic (mg/L)	MW-1612	0.002249	0.0005906	0.026	No	12	0.00142	0.001057	0	None	No	0.01	Param.
Barium (mg/L)	MW-1603	2.393	1.955	2	No	13	2.174	0.2949	0	None	No	0.01	Param.
Barium (mg/L)	**MW-1604**	**3.319**	**3.087**	**2**	**Yes**	**13**	**3.203**	**0.1563**	**0**	**None**	**No**	**0.01**	**Param.**
Barium (mg/L)	MW-1605	1.508	1.178	2	No	13	1.343	0.222	0	None	No	0.01	Param.
Barium (mg/L)	MW-1612	2.316	1.895	2	No	12	2.106	0.2684	0	None	No	0.01	Param.
Beryllium (mg/L)	MW-1603	0.0001	0.00001	0.004	No	13	0.00007908	0.00003976	76.92	None	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-1604	0.0001	0.000007	0.004	No	13	0.00008554	0.0000353	84.62	None	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-1605	0.0001	0.000005	0.004	No	13	0.00007838	0.0000411	76.92	None	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-1612	0.0001	0.000006	0.004	No	12	0.00007217	0.00004231	66.67	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1605	0.00005	0.00002	0.005	No	13	0.00004462	0.0000133	84.62	None	No	0.01	NP (NDs)
Chromium (mg/L)	MW-1603	0.000324	0.000187	0.1	No	13	0.0002775	0.0002206	7.692	None	No	0.01	NP (normality)
Chromium (mg/L)	MW-1604	0.0002882	0.0001374	0.1	No	13	0.0002175	0.00011	0	None	sqrt(x)	0.01	Param.
Chromium (mg/L)	MW-1605	0.0003049	0.0001776	0.1	No	13	0.0002412	0.00008564	0	None	No	0.01	Param.
Chromium (mg/L)	MW-1612	0.0004	0.00019	0.1	No	12	0.0002345	0.00009304	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1603	0.0006599	0.000373	0.006	No	13	0.0005165	0.0001929	0	None	No	0.01	Param.
Cobalt (mg/L)	MW-1604	0.0008115	0.0004922	0.006	No	13	0.0006518	0.0002147	0	None	No	0.01	Param.
Cobalt (mg/L)	MW-1605	0.0003556	0.0001897	0.006	No	13	0.0002727	0.0001115	0	None	No	0.01	Param.
Cobalt (mg/L)	MW-1612	0.0002691	0.0001342	0.006	No	12	0.0002017	0.00008598	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1603	1.391	0.5631	5	No	11	0.9773	0.497	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604	1.803	0.8688	5	No	12	1.336	0.5951	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605	1.841	0.7127	5	No	12	1.277	0.7193	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1612	2.631	1.237	5	No	11	1.934	0.8365	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1603	0.17	0.1	4	No	13	0.1246	0.02876	0	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-1604	0.2522	0.217	4	No	13	0.2346	0.02367	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1605	0.3807	0.3331	4	No	13	0.3569	0.03199	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1612	0.1921	0.1312	4	No	12	0.1617	0.03881	0	None	No	0.01	Param.
Lead (mg/L)	MW-1603	0.0002	0.000009	0.015	No	13	0.0001158	0.0000949	53.85	None	No	0.01	NP (NDs)
Lead (mg/L)	MW-1604	0.0002	0.00001	0.015	No	13	0.0001104	0.00008805	46.15	None	No	0.01	NP (normality)
Lead (mg/L)	MW-1605	0.0002	0.000029	0.015	No	13	0.00009438	0.00007474	30.77	None	No	0.01	NP (normality)
Lead (mg/L)	MW-1612	0.000111	0.00002233	0.015	No	12	0.0001339	0.0001001	41.67	Kaplan-Meier	sqrt(x)	0.01	Param.
Lithium (mg/L)	MW-1603	0.07888	0.0516	0.19	No	13	0.06524	0.01834	0	None	No	0.01	Param.
Lithium (mg/L)	MW-1604	0.08533	0.07501	0.19	No	13	0.08017	0.006935	0	None	No	0.01	Param.
Lithium (mg/L)	MW-1605	0.2067	0.1893	0.19	No	13	0.198	0.01167	0	None	No	0.01	Param.
Lithium (mg/L)	MW-1612	0.1359	0.1152	0.19	No	12	0.1256	0.01319	8.333	None	No	0.01	Param.
Mercury (mg/L)	MW-1603	0.001	0.00006	0.002	No	13	0.0009277	0.0002607	92.31	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1604	0.001	0.00006	0.002	No	13	0.0009277	0.0002607	92.31	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1612	0.001	0.00006	0.002	No	12	0.0009217	0.0002714	91.67	None	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-1603	0.002112	0.0006822	0.1	No	13	0.001463	0.001169	7.692	None	sqrt(x)	0.01	Param.
Molybdenum (mg/L)	MW-1604	0.00157	0.00047	0.1	No	13	0.001095	0.001217	15.38	None	No	0.01	NP (normality)
Molybdenum (mg/L)	MW-1605	0.005549	0.001951	0.1	No	13	0.00375	0.002419	0	None	No	0.01	Param.
Molybdenum (mg/L)	MW-1612	0.0036	0.0007	0.1	No	12	0.002903	0.005453	0	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1603	0.0000793	0.00005129	0.05	No	13	0.00009615	0.00004976	15.38	Kaplan-Meier	sqrt(x)	0.01	Param.
Selenium (mg/L)	MW-1604	0.0002	0.00004	0.05	No	13	0.00008308	0.0000675	23.08	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1605	0.0002	0.00005	0.05	No	13	0.0001123	0.00007293	38.46	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1612	0.0002	0.00003	0.05	No	12	0.00008417	0.00007255	25	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1603	0.0005	0.00001	0.002	No	13	0.0003123	0.0002471	61.54	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1604	0.0005	0.00001	0.002	No	13	0.00035	0.0002342	69.23	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1605	0.0005	0.00001	0.002	No	13	0.0003508	0.000233	69.23	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1612	0.0005	0.00001	0.002	No	12	0.0003383	0.0002389	66.67	None	No	0.01	NP (NDs)

Parametric Confidence Interval

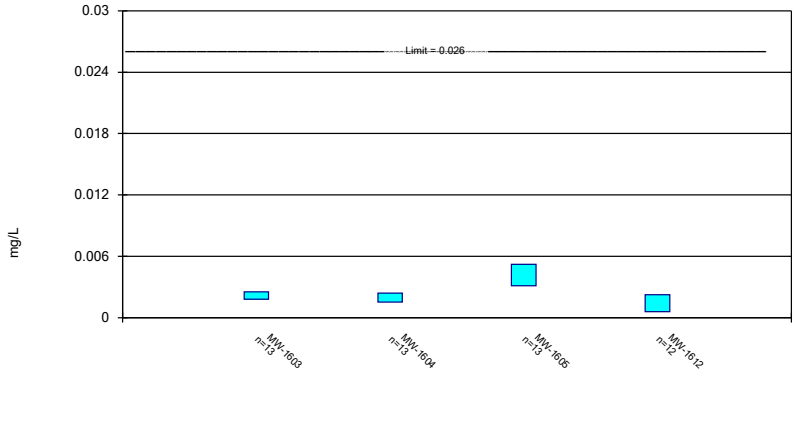
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

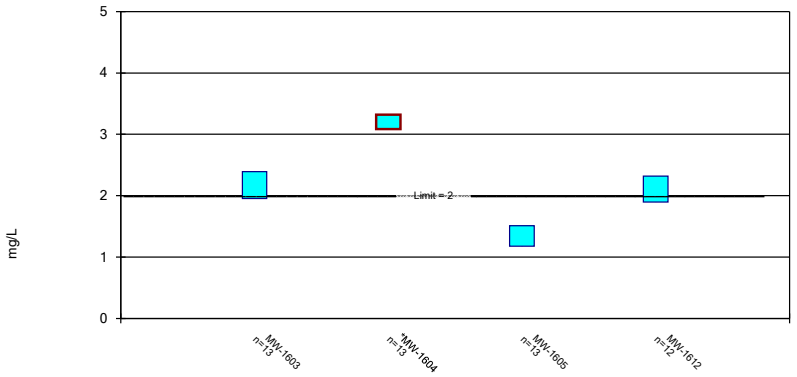
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

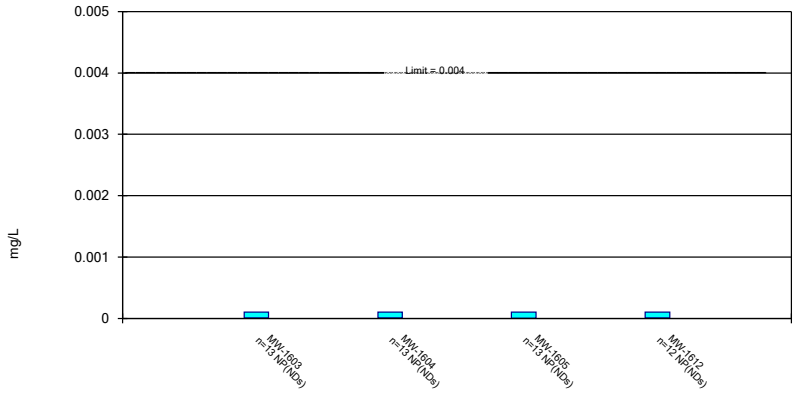
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

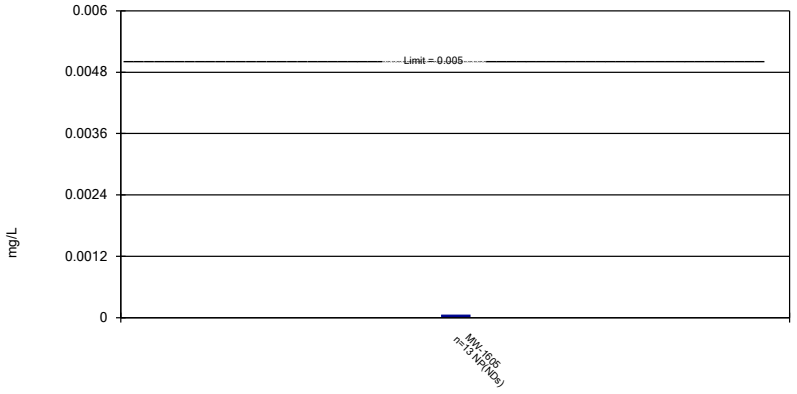
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

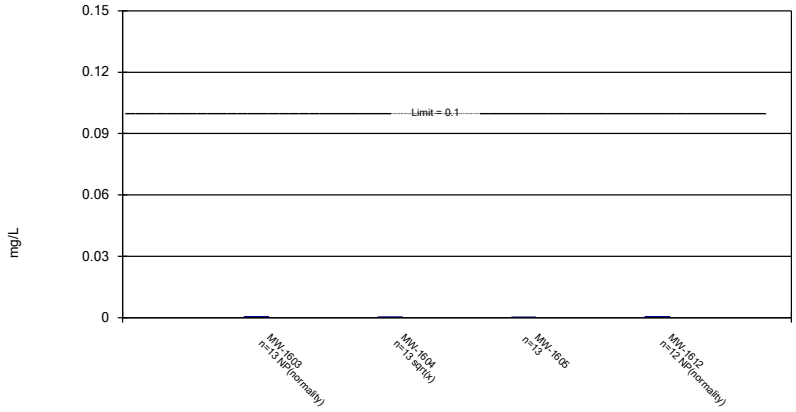
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

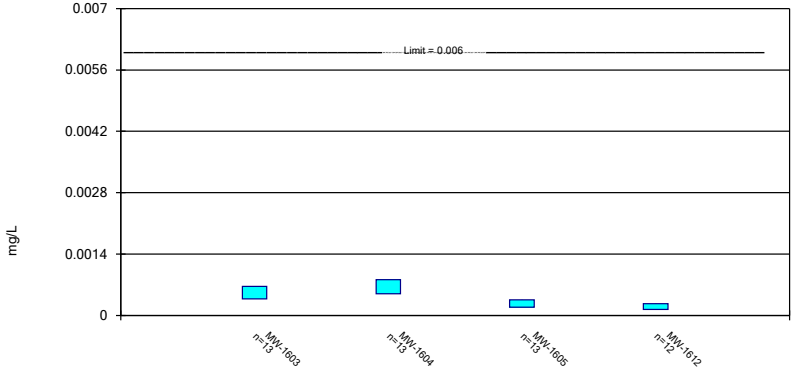
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

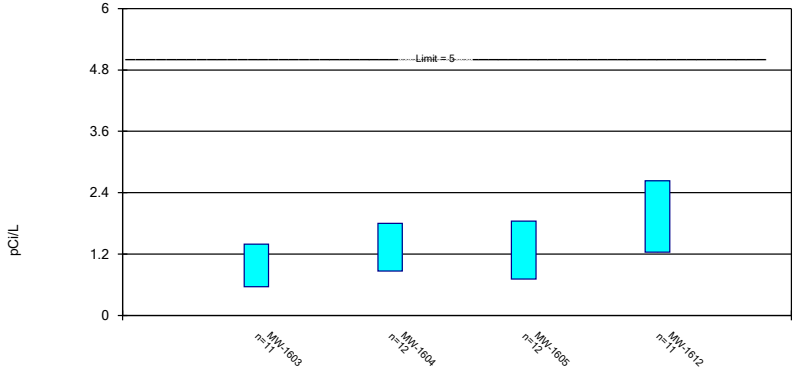
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

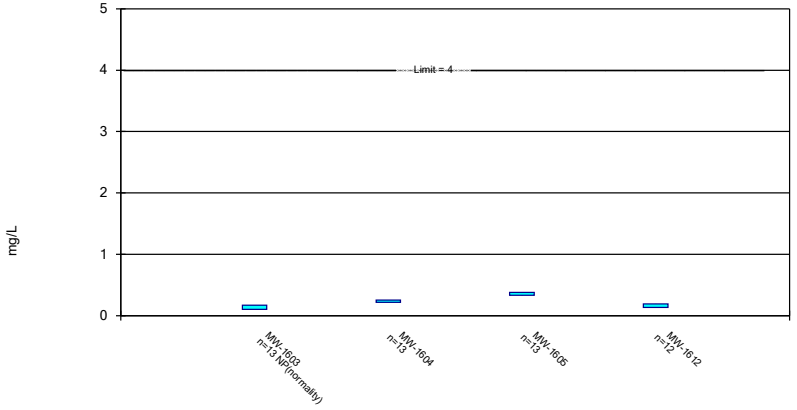
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Ap
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

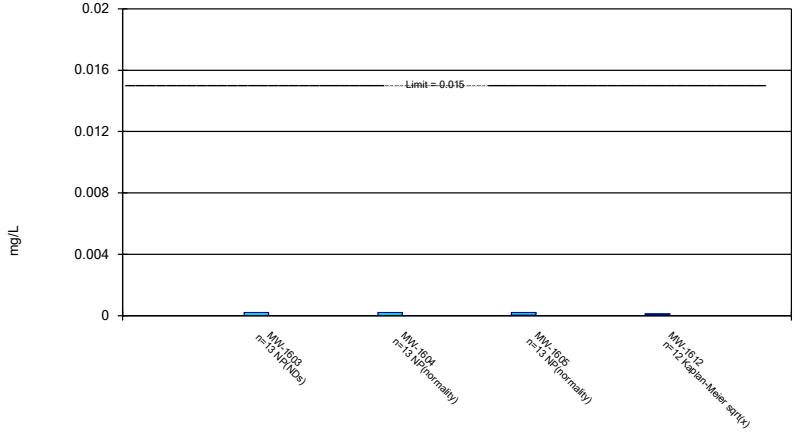
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

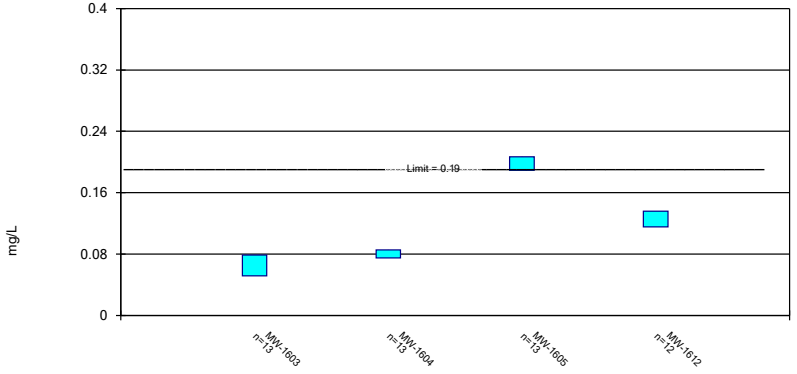
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

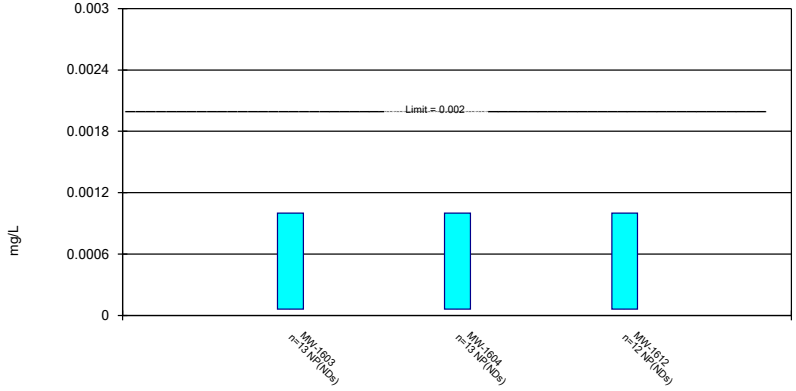
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

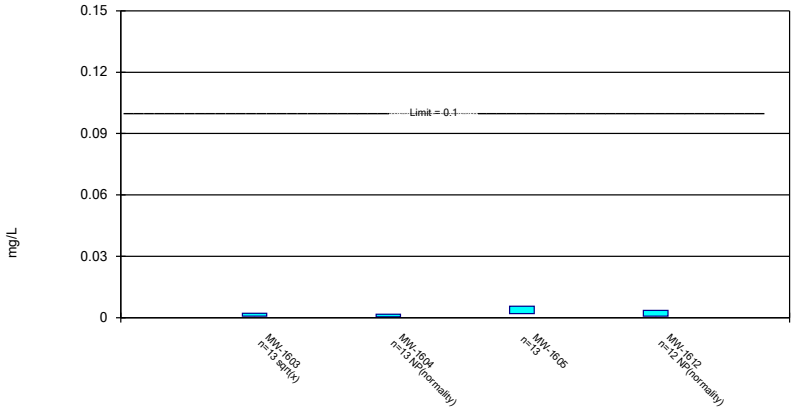
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

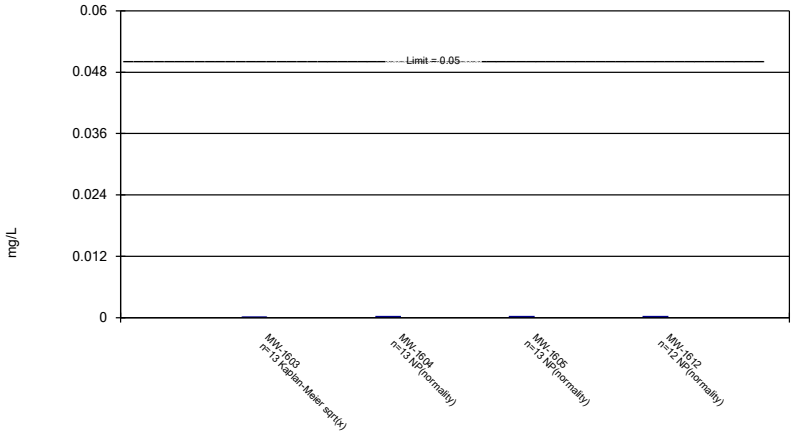


Constituent: Molybdenum Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

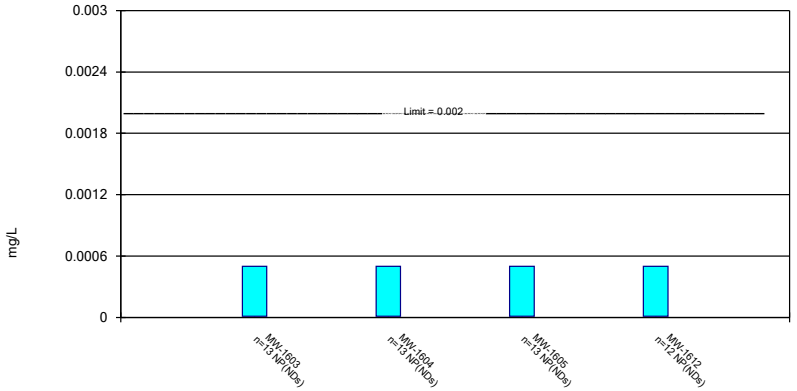


Constituent: Selenium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 7/9/2020 2:51 PM View: Chattanooga Shale - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Confidence Intervals - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt (mg/L)	**MW-1610**	**0.01041**	**0.007446**	**0.006**	**Yes**	**13**	**0.008929**	**0.001995**	**0**	**None**	**No**	**0.01**	**Param.**
Molybdenum (mg/L)	**MW-1610**	**0.1629**	**0.1402**	**0.1**	**Yes**	**13**	**0.1515**	**0.01527**	**0**	**None**	**No**	**0.01**	**Param.**

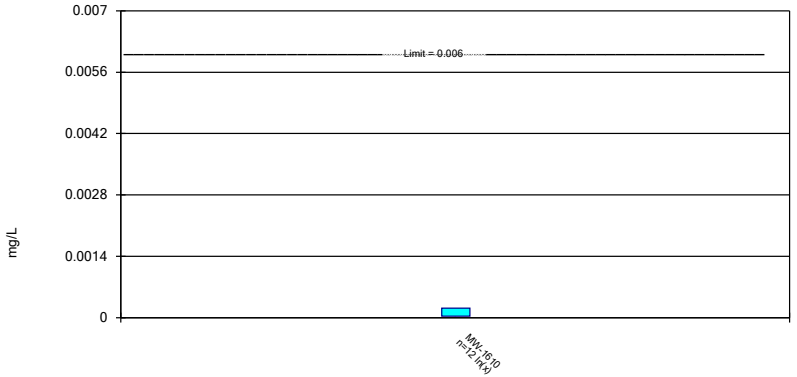
Confidence Intervals - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	MW-1610	0.0002145	0.00003629	0.006	No	12	0.000205	0.0004045	8.333	None	ln(x)	0.01	Param.
Arsenic (mg/L)	MW-1610	0.00155	0.00121	0.046	No	13	0.00138	0.000228	0	None	No	0.01	Param.
Barium (mg/L)	MW-1610	0.2438	0.2036	2	No	13	0.2237	0.02707	0	None	No	0.01	Param.
Beryllium (mg/L)	MW-1610	0.0001	0.000004	0.004	No	13	0.00007069	0.00004576	69.23	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1610	0.00006	0.00002	0.005	No	13	0.00003923	0.00001498	46.15	None	No	0.01	NP (normality)
Chromium (mg/L)	MW-1610	0.000267	0.000167	0.1	No	13	0.0002535	0.0001676	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	**MW-1610**	**0.01041**	**0.007446**	**0.006**	**Yes**	**13**	**0.008929**	**0.001995**	**0**	**None**	**No**	**0.01**	**Param.**
Combined Radium 226 + 228 (pCi/L)	MW-1610	1.459	0.7158	5	No	13	1.087	0.4995	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1610	0.211	0.1844	4	No	13	0.1977	0.01787	0	None	No	0.01	Param.
Lead (mg/L)	MW-1610	0.01133	0.005026	0.015	No	13	0.008178	0.00424	0	None	No	0.01	Param.
Lithium (mg/L)	MW-1610	0.2001	0.1665	0.18	No	13	0.1833	0.02254	0	None	No	0.01	Param.
Mercury (mg/L)	MW-1610	0.001	0.00006	0.002	No	13	0.0009277	0.0002607	92.31	None	No	0.01	NP (NDs)
Molybdenum (mg/L)	**MW-1610**	**0.1629**	**0.1402**	**0.1**	**Yes**	**13**	**0.1515**	**0.01527**	**0**	**None**	**No**	**0.01**	**Param.**
Selenium (mg/L)	MW-1610	0.000396	0.000204	0.05	No	13	0.0003	0.0001291	0	None	No	0.01	Param.
Thallium (mg/L)	MW-1610	0.0005	0.00002	0.002	No	13	0.0002785	0.0002491	53.85	None	No	0.01	NP (NDs)

Parametric Confidence Interval

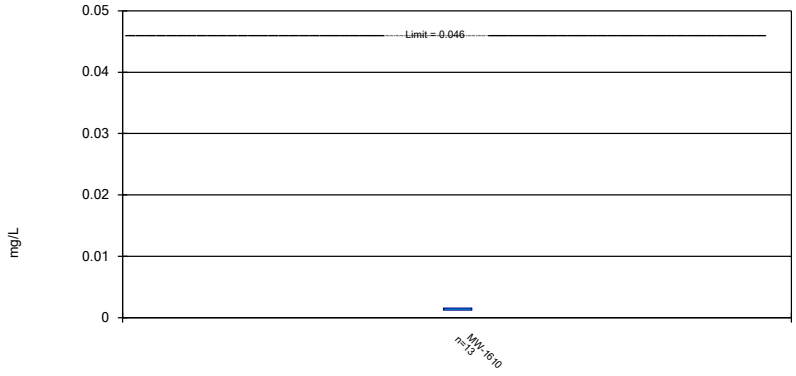
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

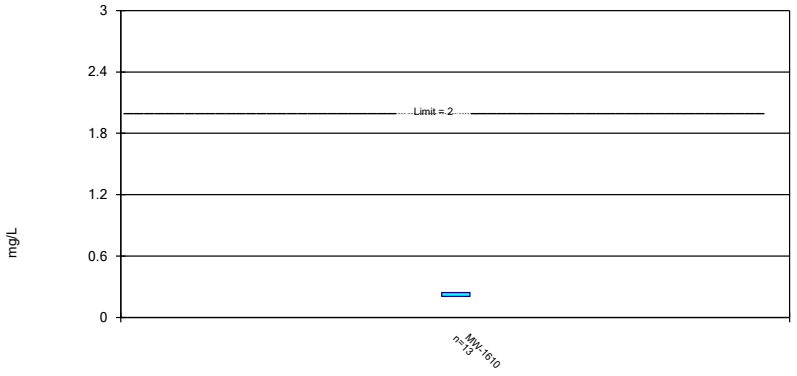
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

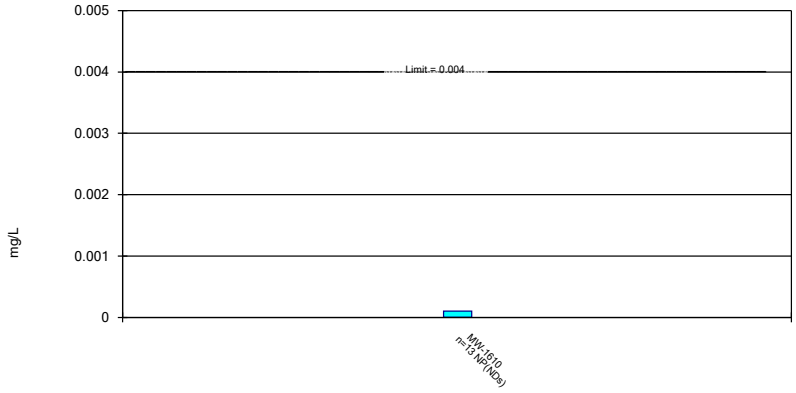
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

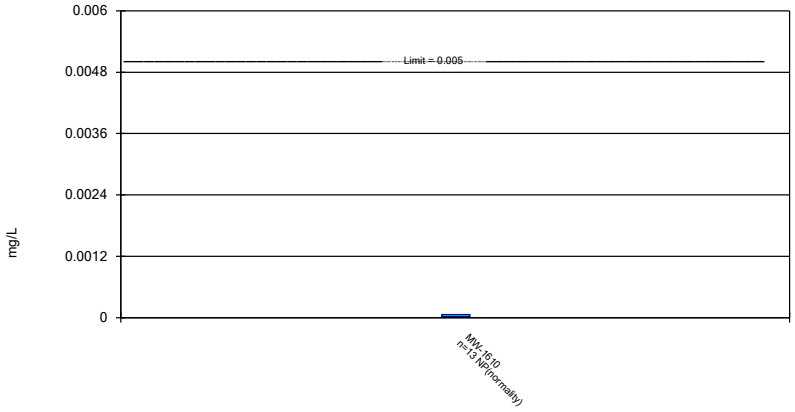
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

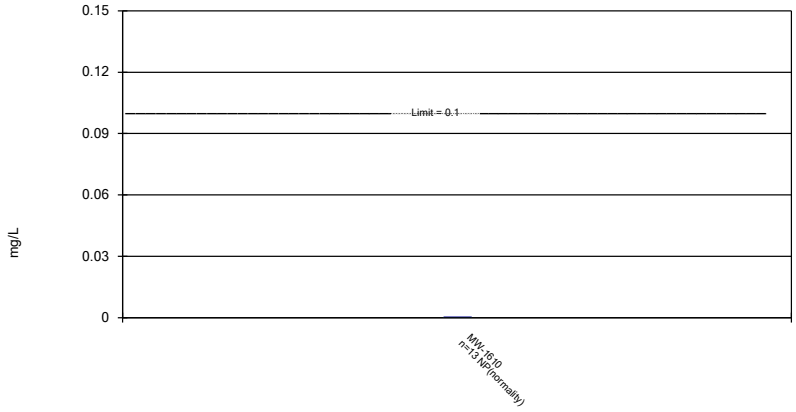
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

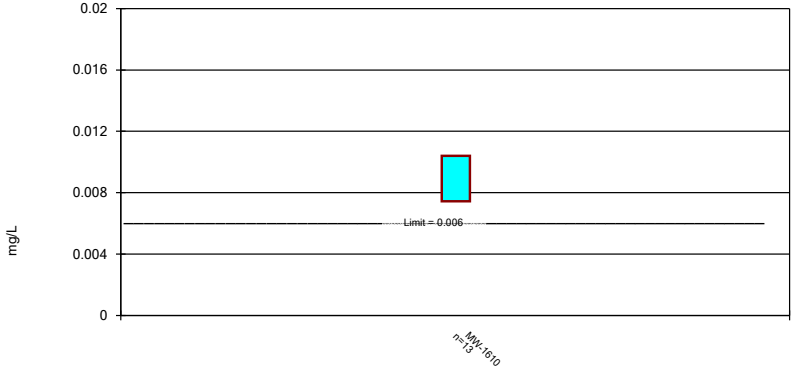
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

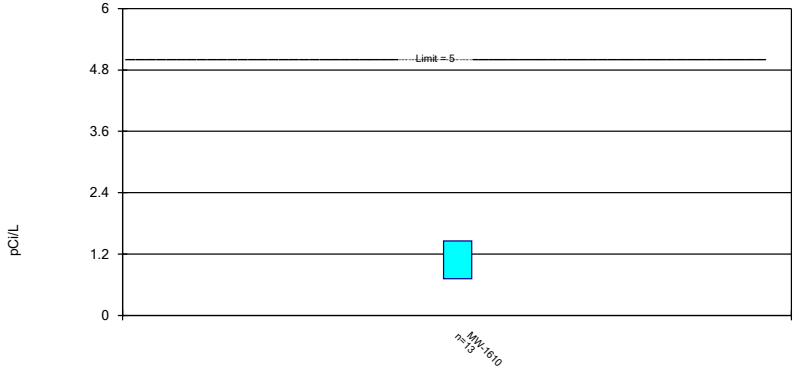
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

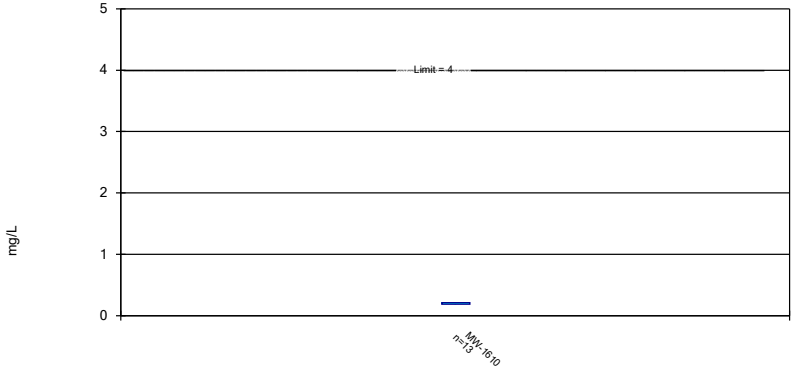
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

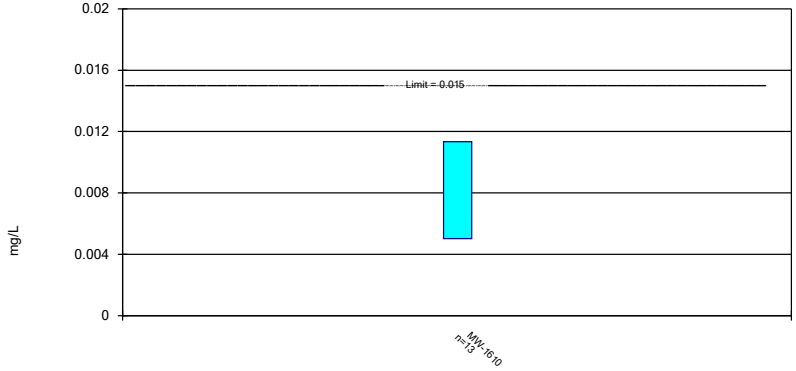


Constituent: Fluoride Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

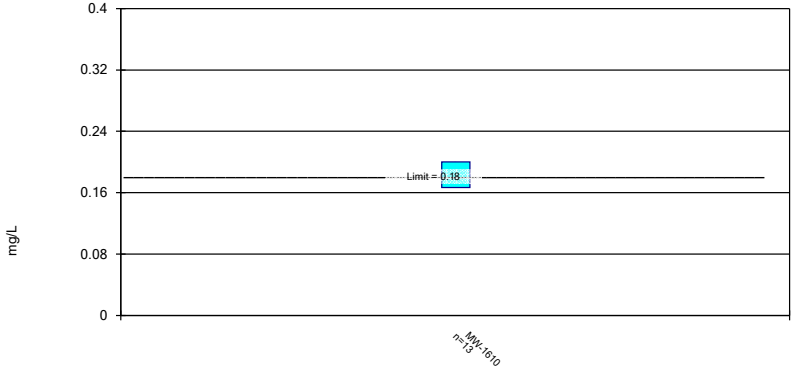


Constituent: Lead Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

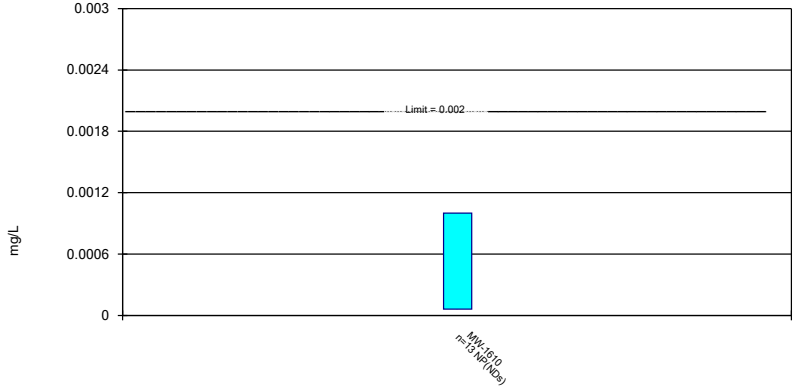


Constituent: Lithium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

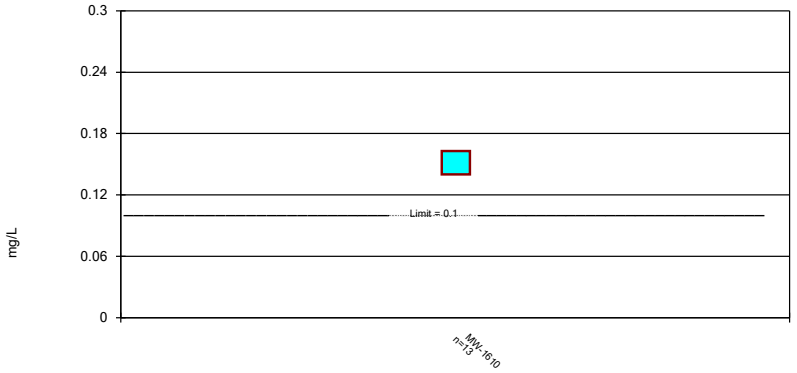
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

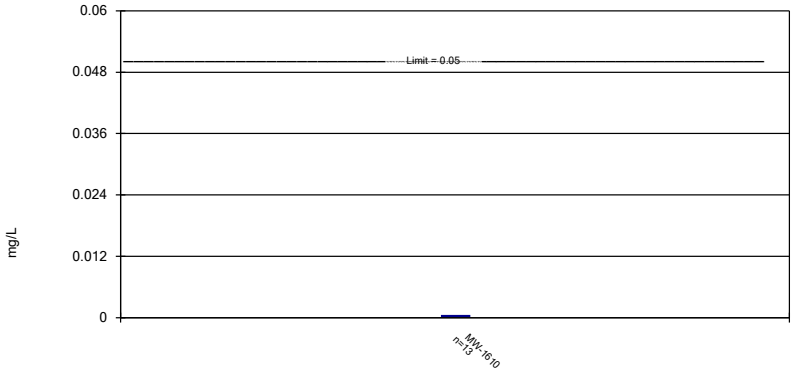


Constituent: Molybdenum Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

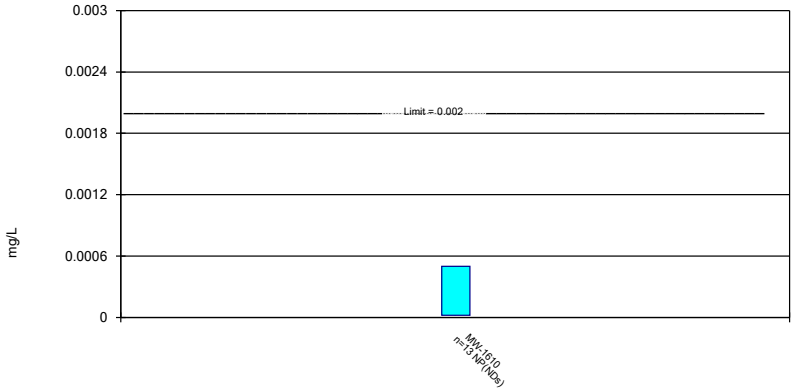


Constituent: Selenium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 7/9/2020 3:38 PM View: Dumps Fault - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Confidence Intervals - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt (mg/L)	**MW-1607**	**0.01159**	**0.008107**	**0.006**	**Yes**	**13**	**0.009848**	**0.002341**	**0**	**None**	**No**	**0.01**	**Param.**
Lithium (mg/L)	**MW-1606**	**0.09338**	**0.06075**	**0.04**	**Yes**	**13**	**0.07707**	**0.02194**	**0**	**None**	**No**	**0.01**	**Param.**
Lithium (mg/L)	**MW-1607**	**0.1311**	**0.1172**	**0.04**	**Yes**	**13**	**0.1242**	**0.009353**	**0**	**None**	**No**	**0.01**	**Param.**
Molybdenum (mg/L)	**MW-1607**	**0.1628**	**0.1288**	**0.1**	**Yes**	**13**	**0.1458**	**0.02285**	**0**	**None**	**No**	**0.01**	**Param.**

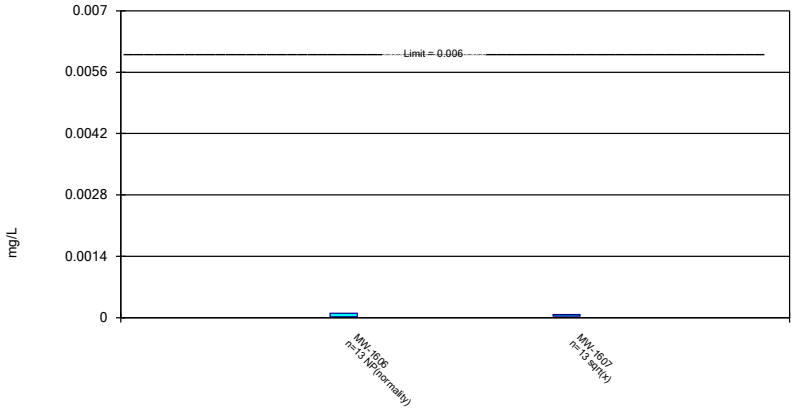
Confidence Intervals - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Landfill AEP Printed 7/9/2020, 3:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	MW-1606	0.0001	0.00002	0.006	No	13	0.00005	0.00003536	30.77	None	No	0.01	NP (normality)
Antimony (mg/L)	MW-1607	0.00006833	0.00003612	0.006	No	13	0.00005308	0.00002323	7.692	None	sqrt(x)	0.01	Param.
Arsenic (mg/L)	MW-1606	0.00833	0.00672	0.01	No	13	0.007255	0.001763	0	None	No	0.01	NP (normality)
Arsenic (mg/L)	MW-1607	0.00438	0.00086	0.01	No	13	0.001715	0.00142	0	None	No	0.01	NP (normality)
Barium (mg/L)	MW-1606	0.1191	0.1065	2	No	13	0.1121	0.01048	0	None	x^4	0.01	Param.
Barium (mg/L)	MW-1607	0.0925	0.0704	2	No	13	0.07937	0.0194	0	None	No	0.01	NP (normality)
Beryllium (mg/L)	MW-1606	0.0001	0.000006	0.004	No	13	0.00006385	0.0000476	61.54	None	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-1607	0.0001	0.000005	0.004	No	13	0.00009269	0.00002635	92.31	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1606	0.00005	0.00001	0.005	No	13	0.00003277	0.00001974	53.85	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1607	0.0001857	0.0001004	0.005	No	13	0.0001431	0.00005736	0	None	No	0.01	Param.
Chromium (mg/L)	MW-1606	0.000225	0.000139	0.1	No	13	0.0002026	0.00006518	0	None	No	0.01	NP (normality)
Chromium (mg/L)	MW-1607	0.000224	0.000194	0.1	No	13	0.0001946	0.00004655	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1606	0.005935	0.004671	0.006	No	13	0.005244	0.001053	0	None	x^2	0.01	Param.
Cobalt (mg/L)	**MW-1607**	**0.01159**	**0.008107**	**0.006**	**Yes**	**13**	**0.009848**	**0.002341**	**0**	**None**	**No**	**0.01**	**Param.**
Combined Radium 226 + 228 (pCi/L)	MW-1606	2.115	1.075	5.5	No	13	1.636	0.7568	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607	1.418	0.5949	5.5	No	12	1.028	0.6226	0	None	sqrt(x)	0.01	Param.
Fluoride (mg/L)	MW-1606	0.2408	0.1746	4	No	13	0.2077	0.04456	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1607	0.2428	0.2033	4	No	13	0.2231	0.02658	0	None	No	0.01	Param.
Lead (mg/L)	MW-1606	0.0005552	0.000342	0.015	No	13	0.0004486	0.0001434	0	None	No	0.01	Param.
Lead (mg/L)	MW-1607	0.0006604	0.0004189	0.015	No	13	0.0005397	0.0001624	0	None	No	0.01	Param.
Lithium (mg/L)	**MW-1606**	**0.09338**	**0.06075**	**0.04**	**Yes**	**13**	**0.07707**	**0.02194**	**0**	**None**	**No**	**0.01**	**Param.**
Lithium (mg/L)	**MW-1607**	**0.1311**	**0.1172**	**0.04**	**Yes**	**13**	**0.1242**	**0.009353**	**0**	**None**	**No**	**0.01**	**Param.**
Mercury (mg/L)	MW-1606	0.001	0.00006	0.002	No	13	0.0009277	0.0002607	92.31	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1607	0.001	0.00008	0.002	No	13	0.0009292	0.0002552	92.31	None	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-1606	0.08404	0.0563	0.1	No	13	0.07017	0.01865	0	None	No	0.01	Param.
Molybdenum (mg/L)	**MW-1607**	**0.1628**	**0.1288**	**0.1**	**Yes**	**13**	**0.1458**	**0.02285**	**0**	**None**	**No**	**0.01**	**Param.**
Selenium (mg/L)	MW-1606	0.0001105	0.00005732	0.05	No	13	0.00008538	0.00004034	0	None	sqrt(x)	0.01	Param.
Selenium (mg/L)	MW-1607	0.0002544	0.00008454	0.05	No	13	0.0001938	0.0001778	0	None	ln(x)	0.01	Param.
Thallium (mg/L)	MW-1606	0.0005	0.00004	0.002	No	13	0.0002585	0.0002333	46.15	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1607	0.0005	0.00001	0.002	No	13	0.0002869	0.0002405	53.85	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

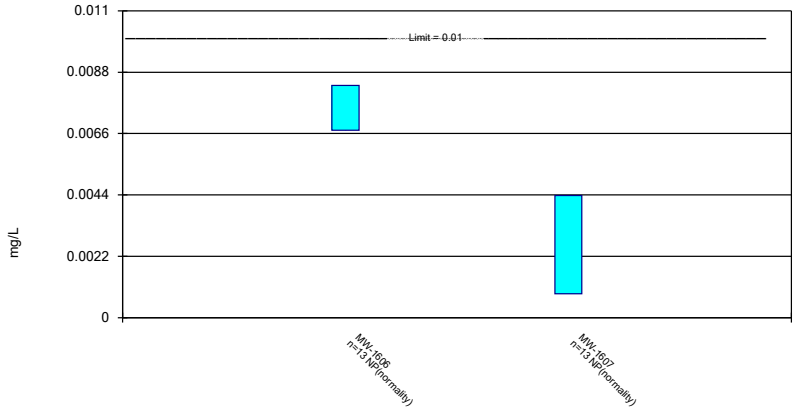
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

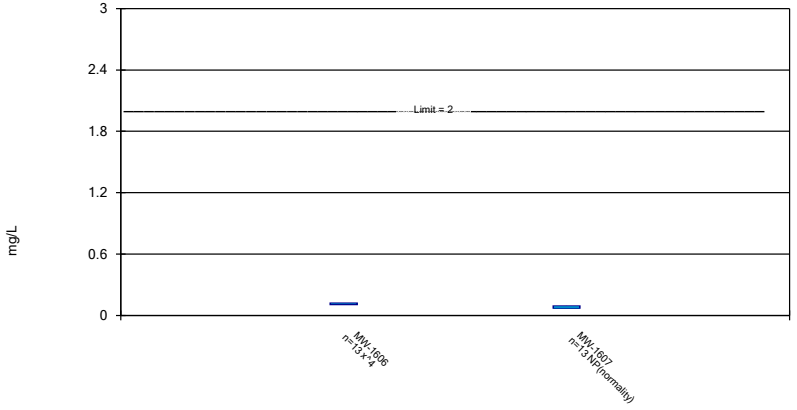
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

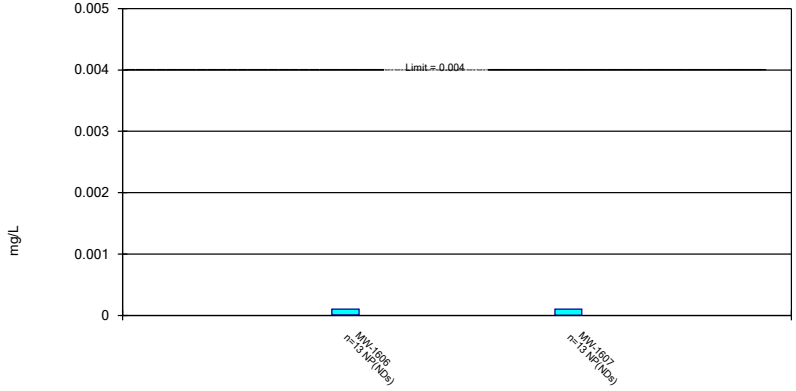
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

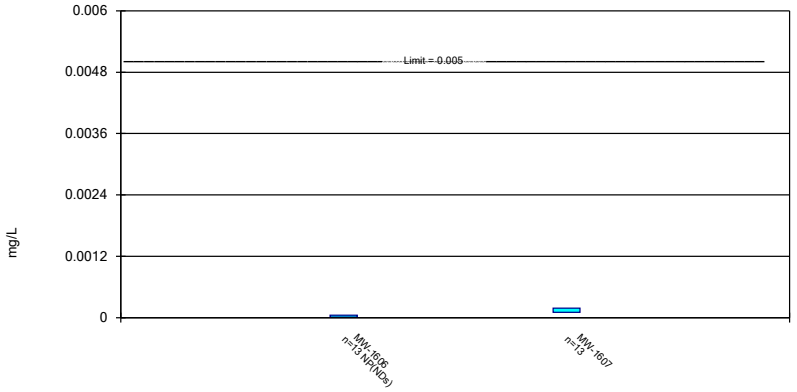
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric and Non-Parametric (NP) Confidence Interval

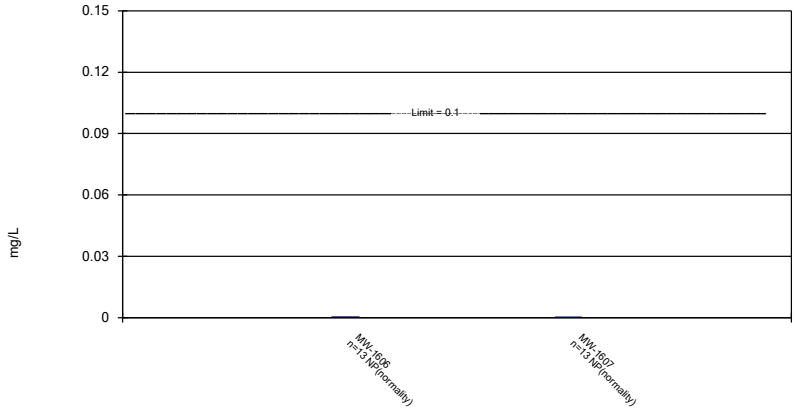
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

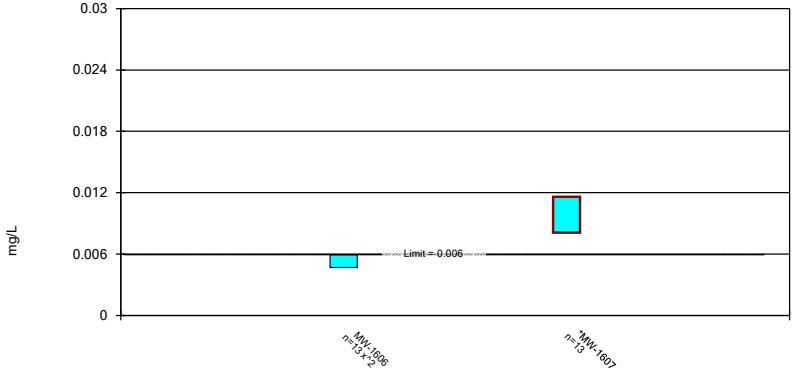
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

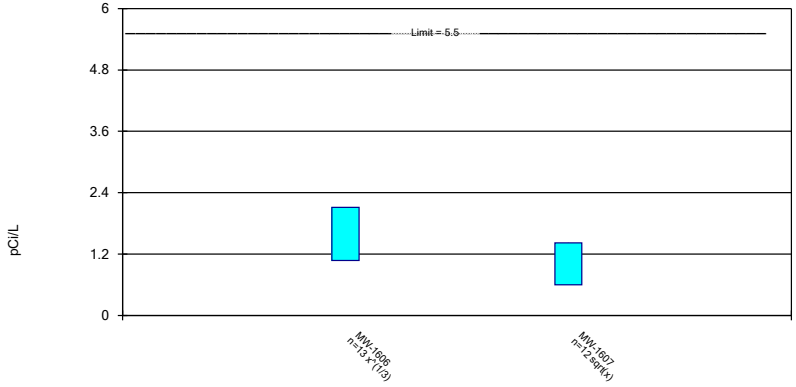
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

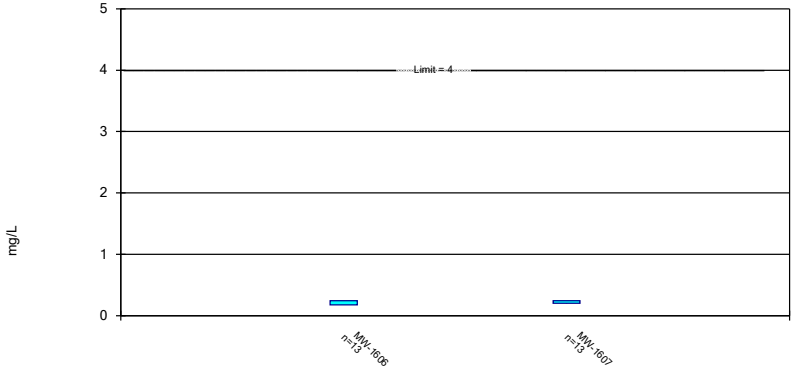
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appe
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

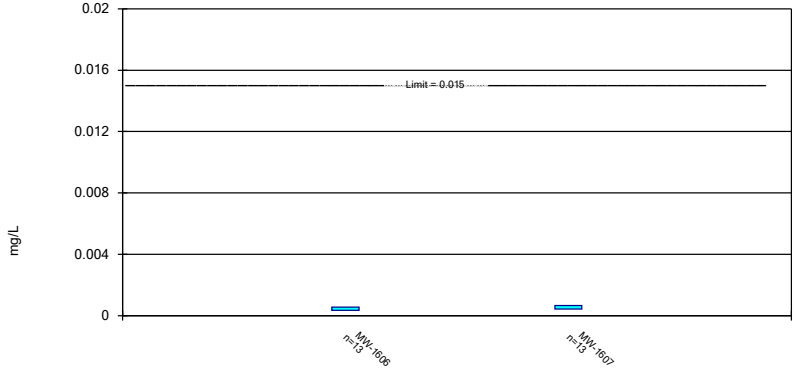
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

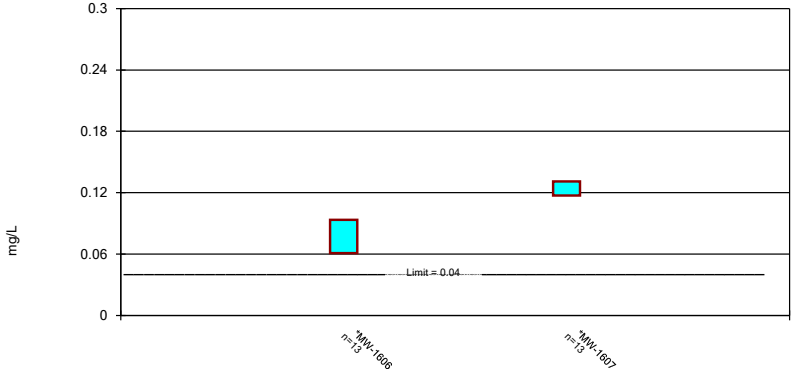
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

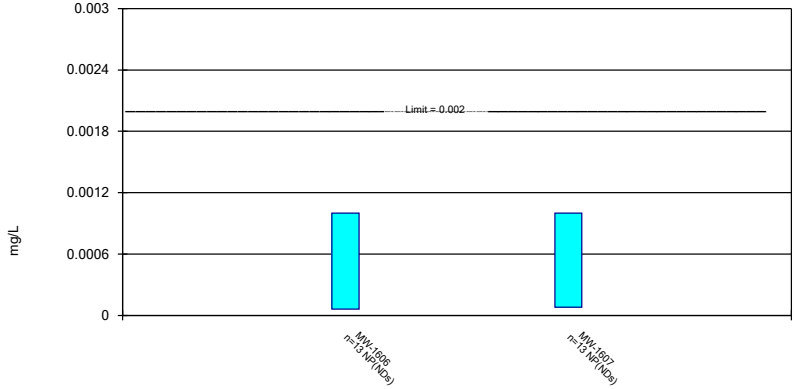
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Non-Parametric Confidence Interval

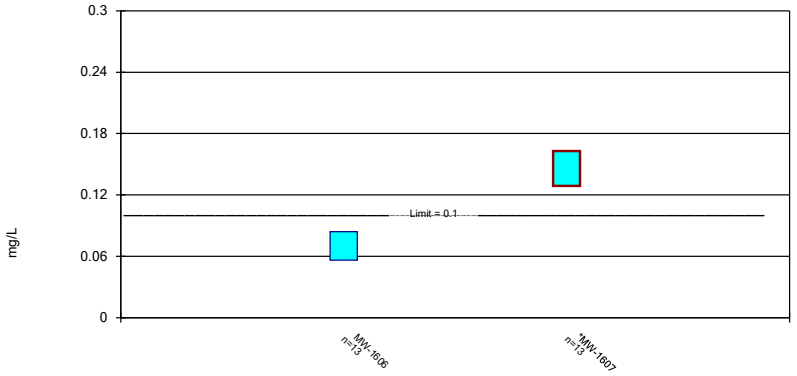
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

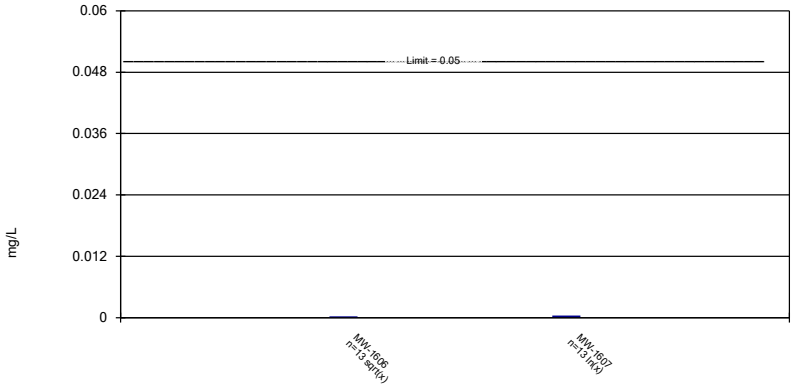


Constituent: Molybdenum Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

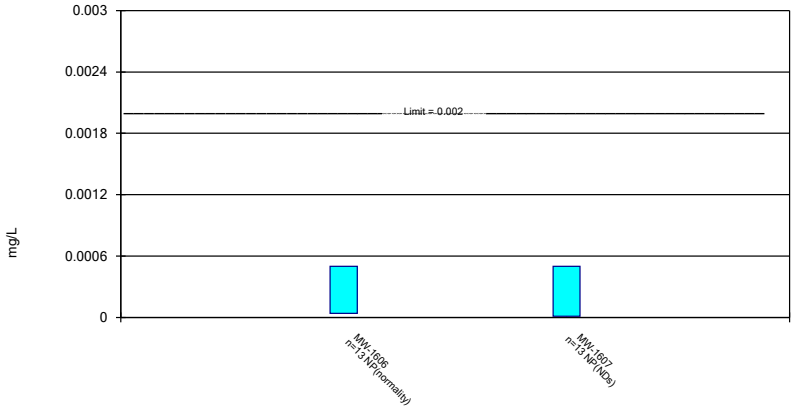


Constituent: Selenium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

Sanitas™ v.9.6.26d Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 7/9/2020 3:17 PM View: Rome Limestone - Appendix IV
Clinch River LF Client: AEP Data: Clinch River Landfill AEP

APPENDIX 3 – Alternate Source Demonstrations

No new alternate source demonstrations have been completed as of January 31, 2021.

APPENDIX 4 – Notices for Monitoring Program Transitions

The notification that an assessment monitoring program and assessment of corrective measure was initiated follows.

Clinch River Plant
Notice of Assessment Monitoring Program Establishment
Pond 1 CCR Management Unit

On July 15, 2019, it was determined that Clinch River Plant's Pond 1 had statistically significant increases over background for calcium, chloride and sulfate and a statistically significant decrease for pH.

Clinch River Pond 1 was officially closed on August 6, 2018 under a Solid Waste Permit issued by Virginia Department of Environmental Quality. The State solid waste permit included a groundwater monitoring program that required the groundwater to be sampled and analyzed for Appendix III, Appendix IV and additional State parameters immediately following the collection of background. Under the State statistical methods, the statistical analysis of the first compliance sampling event indicated statistical significant increases above groundwater protection standards for cobalt, lithium, molybdenum, nickel, lead and barium. Nickel and lead are State-only parameters.

Based on the results of the State statistical analysis, Appalachian Power Company made the decision to statistically evaluate Appendix IV parameters during the first Federal CCR detection monitoring event. This evaluation following Federal statistical analysis methods, indicated statistical significant increases above groundwater protection standards for barium, cobalt, lithium and molybdenum. This evaluation can be found as Appendix 2 of the Annual Groundwater Report dated August 1, 2019.

At this point, no alternate source demonstration (ASD) for Appendix III parameters will be completed in accordance with §257.94(e)(2), prompting the initiation of an assessment monitoring program, which was established on July 15, 2019. Therefore this notice is being placed in the operating record in accordance with the requirement of 257.94(e)(3). If a successful ASD is completed for the Appendix IV exceedances then an ASD will be completed for the Appendix III parameters.

Clinch River Plant

Notice for Initiating an Assessment of Corrective Measures

CCR Unit – Pond 1

This notice is being provided, as required by 40 CFR 257.95(g)(5), that an Assessment of Corrective Measures was initiated on October 13, 2019 for Clinch River Plant's Pond 1 due to the statistically significant concentrations detected above the established groundwater protection standards for cobalt, lithium, molybdenum and barium.

APPENDIX 5 – Well Installation/Decommissioning Logs

Nature and extent well installation report follows.

Via E-mail

June 4, 2020

Mr. Jeffrey Hurst
Regional Director
Virginia Department of Environmental Quality
P.O. Box 1688
Abingdon, VA 24212-1688

Subject: Clinch River Pond 1 – Permit No. 620
Monitoring Well Construction Certifications (W-2012S and W-2012D)

Dear Mr. Hurst,

On behalf of Appalachian Power Company's Clinch River Plant, I am submitting the attached monitoring well construction certifications for W-2012S and W-2012D, and an updated Monitoring Well Network Figure.

These wells were installed as part of the Nature and Extent Study for the Closed Pond 1 Permit No. 620 and in accordance with 9VAC20-81- 250.A.3.g. and 9VAC20-81-260.C.1.a.

If you have any questions, please contact me at (614) 716-2259 or jrjent@aep.com.

Sincerely,

Justin R. Jent

Justin R. Jent, P.E.
Environmental Services

cc: John Surber – VDEQ (Abingdon)
Dan Manweiler – VDEQ (Abingdon)
Karen Gilmer – APCo Clinch River Plant

Groundwater Monitoring Well
AEP Clinch River
Cleveland, Virginia

I certify, as a qualified professional engineer in the Commonwealth of Virginia, that monitoring wells W-2012S and W-2012D were installed in accordance with the boring log and monitoring well construction diagrams provided to comply with VAC20-81-250.A.3.d. This certification has been prepared to comply with the requirements of 9VAC20-81-250.A.3.g.

Signature

June 3, 2020
Date

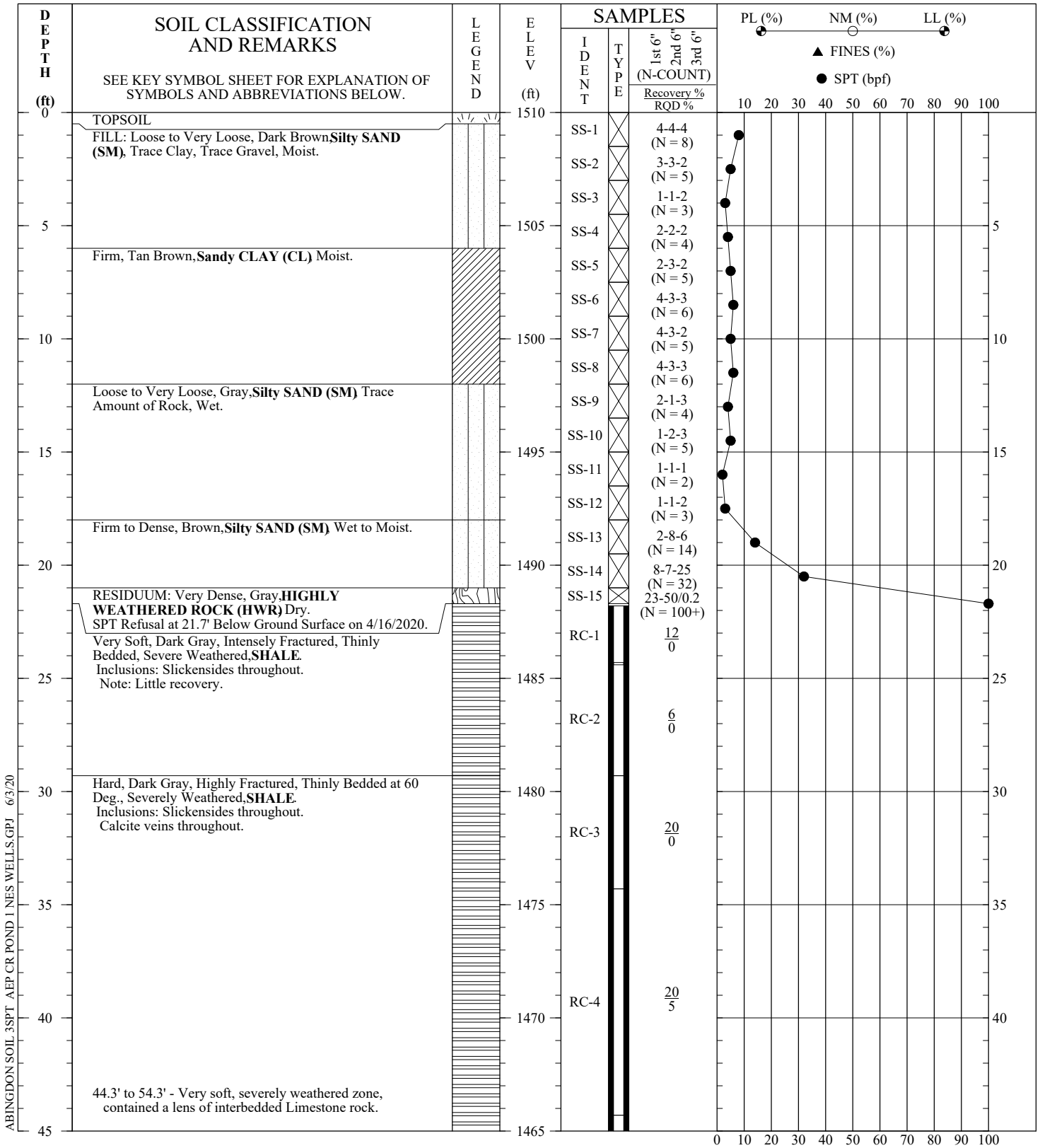
Jason C. Monk P.E.
Project Manager
Wood Environment and Infrastructure Solutions, Inc.
1070 West Main Street, Suite 5
Abingdon, VA 24210

Attachments:

1) Boring Log
2) Well Construction Diagrams

Attachment 1:

Boring Log



ABINGDON SOIL 3SPT AEP CR POND 1 NES WELLS.GPJ 6/3/20

ELEVATION: 1,510.1031
NORTHING: 3521946.2622
EASTING: 10403388.5769
DRILLER: AEP - Z. Racer
EQUIPMENT: Diedrich 120
METHOD: SPT NQ
LOGGED BY: RFS **REVIEWED BY:** JCM
REMARKS:

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

TEST BORING RECORD

Boring: W-2012D
Date Drilled: 4/16/2020 to 4/16/2020
Project: AEP Pond 1 NES Wells
Project No.: 3050-19-0349
Project Location: Cleveland, Virginia

Wood Environment & Infrastructure Solutions, Inc.
1070 West Main Street, Suite 5
Abingdon, Virginia 24210

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES 1st 6" 2nd 6" 3rd 6" (N-COUNT) Recovery % RQD %	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (bpf)
45	SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.		1465				10 20 30 40 50 60 70 80 90 100
	Hard, Dark Gray, Highly Fractured, Thinly Bedded at 60 Deg., Severely Weathered, **SHALE**. Inclusions: Slickensides throughout. Calcite veins throughout.						
50			1460	RC-5		16 / 0	50
55			1455				55
60			1450	RC-6		30 / 0	60
65	64.3' - 45 deg bedding, with interbedded light gray shale.		1445				65
70	69.0' to 74.0' - Very soft zone, severely weathered.		1440	RC-7		38 / 0	70
75	74.0' to 90.0' - Interbedded light gray Shale with calcite veins, bedded at 45 deg.		1435				75
80			1430	RC-8		38 / 4	80
85			1425				85
90			1420	RC-9		48 / 14	0 10 20 30 40 50 60 70 80 90 100

ABINGDON SOIL 3SPT AEP CR POND 1 NES WELLS.GPJ 6/3/20

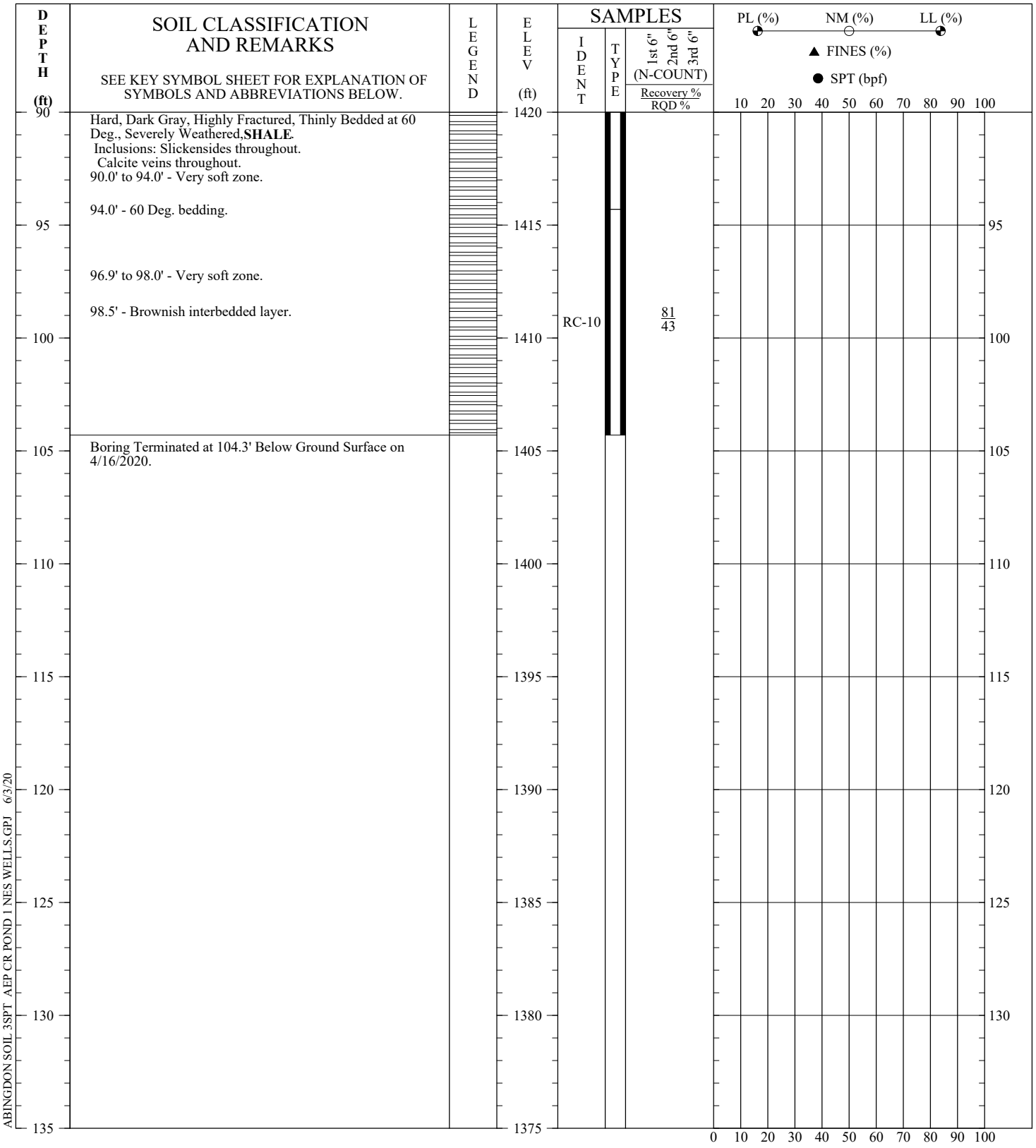
ELEVATION: 1,510.1031
NORTHING: 3521946.2622
EASTING: 10403388.5769
DRILLER: AEP - Z. Racer
EQUIPMENT: Diedrich 120
METHOD: SPT NQ
LOGGED BY: RFS **REVIEWED BY:** JCM
REMARKS:

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

TEST BORING RECORD

Boring: W-2012D
Date Drilled: 4/16/2020 to 4/16/2020
Project: AEP Pond 1 NES Wells
Project No.: 3050-19-0349
Project Location: Cleveland, Virginia

wood.
Wood Environment & Infrastructure Solutions, Inc.
1070 West Main Street, Suite 5
Abingdon, Virginia 24210



ELEVATION: 1,510.1031
NORTHING: 3521946.2622
EASTING: 10403388.5769
DRILLER: AEP - Z. Racer
EQUIPMENT: Diedrich 120
METHOD: SPT NQ
LOGGED BY: RFS **REVIEWED BY:** JCM
REMARKS:

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

TEST BORING RECORD

Boring: W-2012D
Date Drilled: 4/16/2020 to 4/16/2020
Project: AEP Pond 1 NES Wells
Project No.: 3050-19-0349
Project Location: Cleveland, Virginia

Wood Environment & Infrastructure Solutions, Inc.
1070 West Main Street, Suite 5
Abingdon, Virginia 24210

Attachment 2:

Well Construction Diagrams

MONITORING WELL CONSTRUCTION LOG

PROJECT NAME:	AEP C.R. Pond 1 NES Wells	**BORING NO:**	W-2012D
PROJECT LOCATION:	Carbo, VA	**ELEVATION (G.S.):**	1510.103
WOOD PROJECT #:	3050-19-0394	**DATE DRILLED:**	4/16/2020 to 4/17/2020
		DATE WELL CONST.:	4/21/2020 to 4/22/2020

Monitoring Well Construction Details

Date Set Start:	4/21/2020	Surface Comp:	2'x'2 Conc. Alu. Protector	Grout:	Cetco Pure Gold 30%- 5 bags
Set By:	Z. Racer - AEP Civil	Pipe Size:	2" Flush Thread Sch. 40	Sand:	Global #5 - 300 lb.
Date Complete:	4/22/2020	Screen Size:	0.010 Slot	Bentonite:	Pel-Plug 3/8" TR.30 - 350 lb.
Datum:	Ground Surface				Haliburton 3/8" Hole Plug - 350 lb.

Well Survey Information

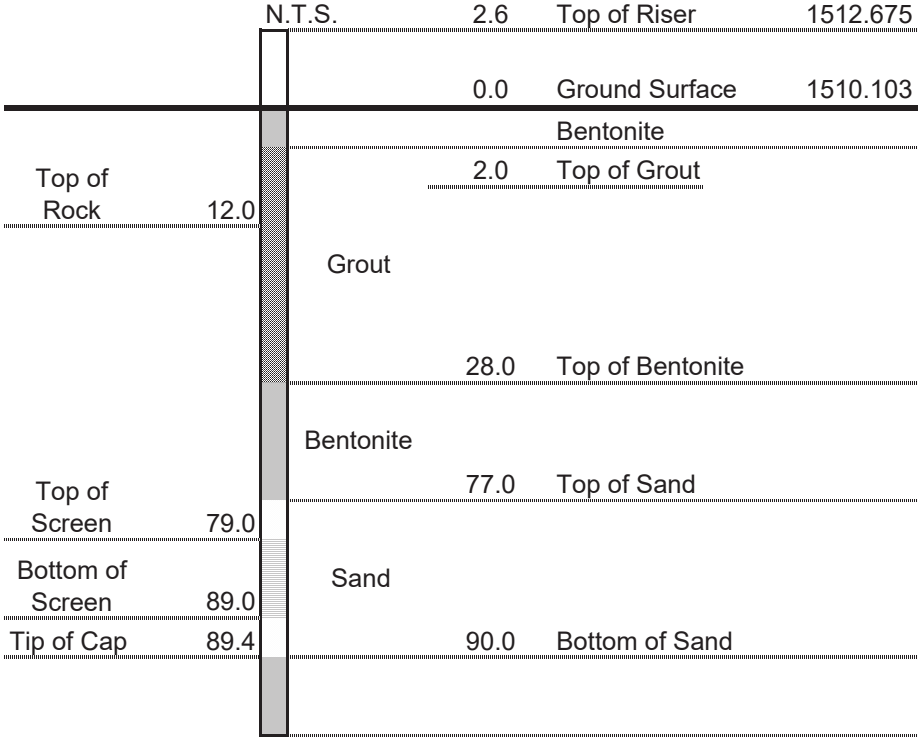
Top of Well Casing Elevation	1512.675
Concrete Pad Elevation	1510.463
Ground Surface Elevation	1510.103
Northing Top of Well Riser	3,521,946.26
Easting Top of Well Riser	10,403,388.58

Well Construction Information

Depth to Bed Rock	12.0
Depth of NQ Core	104.3
Depth of 6" Over Drill	90.0

Bentonite	0.0	to	2.0
Grout	2.0	to	28.0
Bentonite	28.0	to	77.0
Sand	77.0	to	90.0
Bentonite	90.0	to	104.3
Comp. Stickup	2.6	to	0.0
Riser Pipe to GS	0.0	to	79.0
Screen	79.0	to	89.0
Pipe Cap at	89.4		

Well Diagram



COMMENTS: Well installed using 6" percussion downhole hammer. NQ filled with bentonite pellets. Bentonite pellets used to fill to top of rock to prevent grout bleeding to offset well.

Set dedicated bladder pump on 6/5/2020: Geotech, 166SS36 with Teflon bladder, 3/8" Teflon lined tubing, stainless safety cable and slip fit cap.

Logged by: RFS

Checked by: JCM

wood.

MONITORING WELL CONSTRUCTION LOG

PROJECT NAME:	AEP C.R. Pond 1 NES Wells	**BORING NO:**	W-2012S
PROJECT LOCATION:	Carbo, VA	**ELEVATION (G.S.):**	1510.095
WOOD PROJECT #:	3050-19-0394	**DATE DRILLED:**	4/21/2020 to 4/21/2020
		DATE WELL CONST.:	4/21/2020 to 4/22/2020

Monitoring Well Construction Details

Date Set Start:	4/21/2020	Surface Comp:	2'x'2 Conc. Alu. Protector	Grout:	Cetco Pure Gold 30%- 3 bags
Set By:	Z. Racer - AEP Civil	Pipe Size:	2" Flush Thread Sch. 40	Sand:	Global #5 - 250 lb
Date Complete:	4/22/2020	Screen Size:	0.010 Slot	Bentonite:	Pel-Plug 3/8" TR.30 - 100 lb
Datum:	Ground Surface				

Well Survey Information

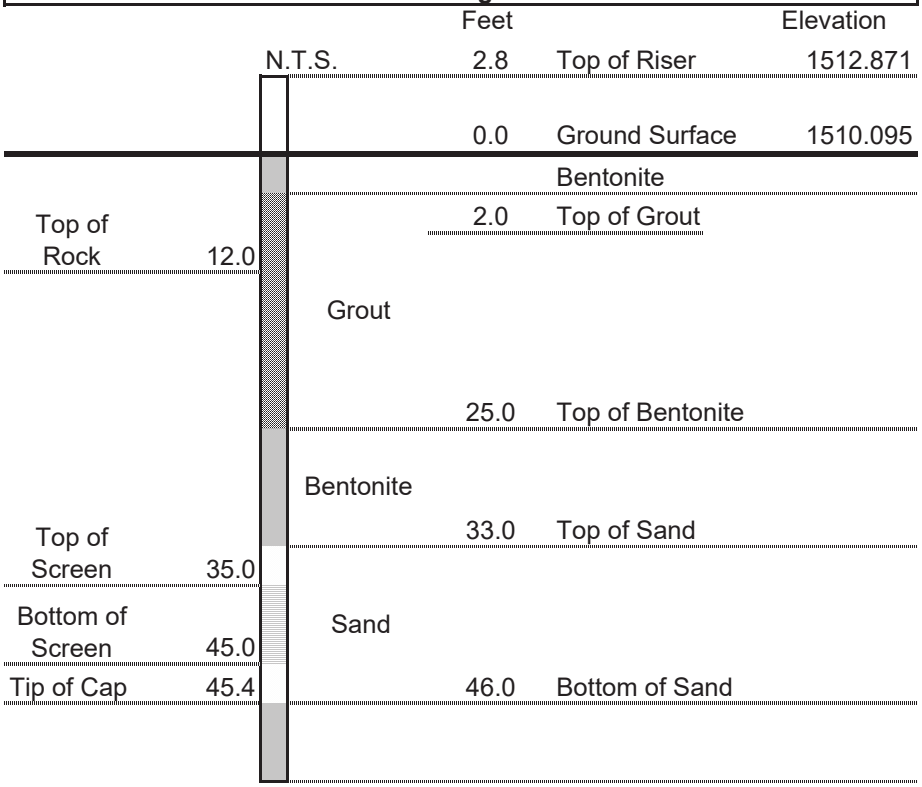
Top of Well Casing Elevation	1512.871
Concrete Pad Elevation	1510.416
Ground Surface Elevation	1510.095
Northing Top of Well Riser	3,521,940.87
Easting Top of Well Riser	10,403,382.98

Well Construction Information

Depth to Bed Rock	12.0
Depth of NQ Core	N/A
Depth of 6" Over Drill	46.0

Bentonite	0.0	to	2.0
Grout	2.0	to	25.0
Bentonite	25.0	to	33.0
Sand	33.0	to	46.0
Bentonite		to	
Comp. Stickup	2.8	to	0.0
Riser Pipe to GS	0.0	to	35.0
Screen	35.0	to	45.0
Pipe Cap at	45.4		

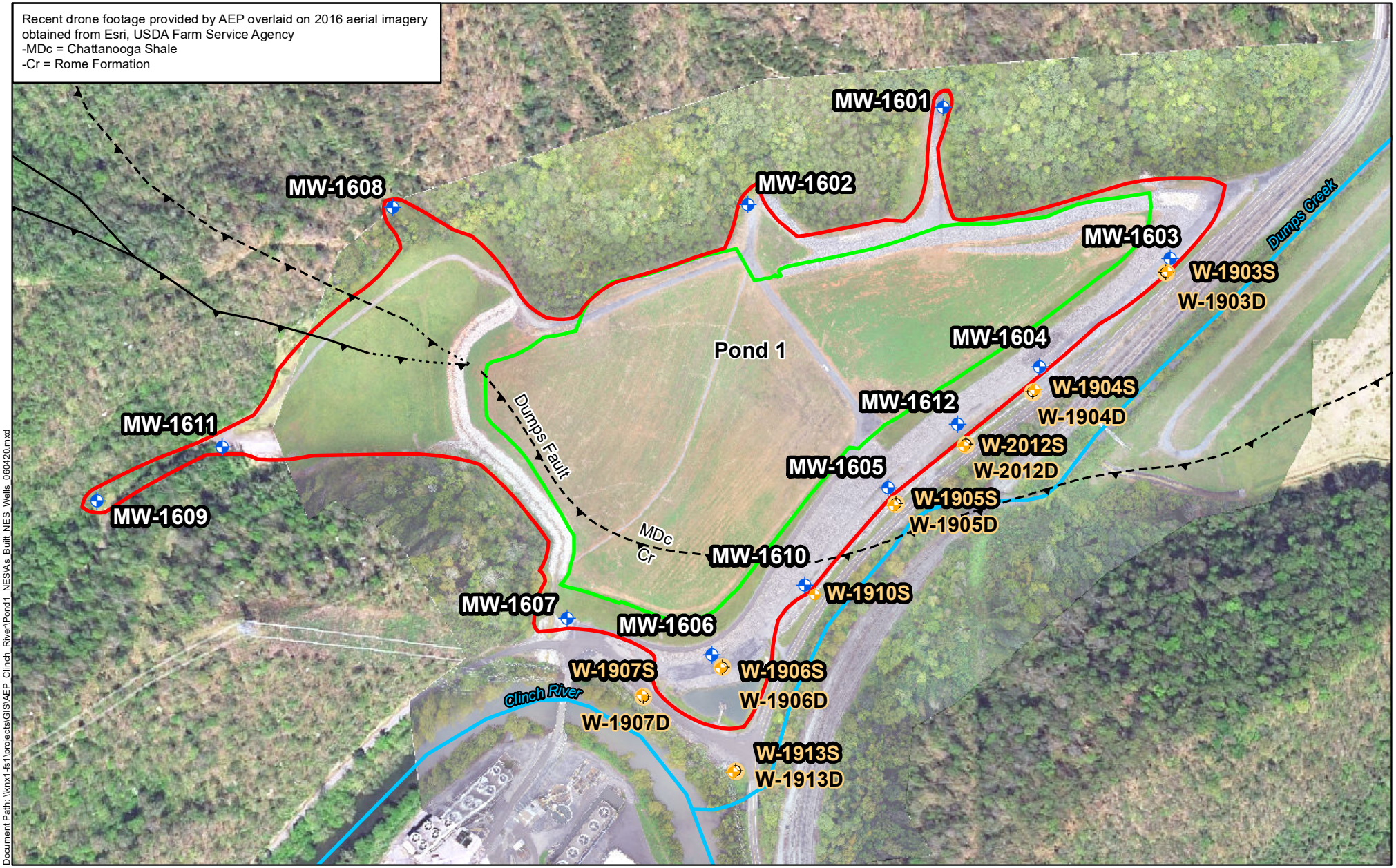
Well Diagram



COMMENTS: Well installed using 6" percussion downhole hammer. Did not core due to offset.
Set dedicated bladder pump on 06/05/2020: Geotech, 166SS36 with Teflon bladder, 3/8" Teflon lined tubing, stainless safety cable and slip fit cap.

Logged by: RFS

Checked by: JCM



Document Path: \\knx1-fs1\projects\GIS\AEP_Clinch_River\Pond1_NES\As_Built_NES_Wells_060420.mxd

SYMBOL KEY

- Pond 1 Monitoring Well
- Shallow NES Well
- Deep NES Well
- Pond 1 VA Permit SWP620 Boundary
- Pond 1 CCR Unit Boundary
- Fault
- Stream/Surface Water

APPALACHIAN POWER — An AEP Company — BOUNDLESS ENERGY™

wood.

N

0 50 100 200 300 Meters

0 150 300 600 900 1,200 Feet

FIGURE 1
Pond 1 Monitoring and Nature and Extent Study Wells
American Electric Power, Clinch River Plant
Carbo, Virginia

06/04/2020	As_Built_NES_Wells_060420	
PROJ: 7362172422	Drawn: BF	