Annual Groundwater Monitoring Report

Southwestern Electric Power Company

H. W. Pirkey Power Plant

Landfill CCR Management Unit

CN600126767; RN100214287

Registration No: CCR104

Hallsville, Texas

January 31, 2024

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SOUTHWESTERN ELECTRIC POWER COMPANY℠

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Abbreviations:
ASD - Alternate Source Demonstration
CCR – Coal Combustion Residual
GWPS - Groundwater protection standards
SSI - Statistically Significant Increase
SSL - Statistically Significant Level
TCEQ – Texas Commission on Environmental Quality

I. Summary

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for the Landfill (LF) Coal Combustion Residual (CCR) unit at Pirkey Power Plant. Southwestern Electric Power Company is wholly-owned subsidiary of American Electric Power Company (AEP). The Texas Commission on Environmental Quality's (TCEQ's) CCR rule requires that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31, 2024.

In general, the following activities were completed:

- At the start of the current annual reporting period, the LF was operating under the Detection monitoring program.
- At the end of the current annual reporting period, the LF was operating under the Detection monitoring program.
- Groundwater samples were collected for AD-8, AD-12, AD-16, AD-23, AD-27, AD-34 and AD-36 in June and October 2023 and analyzed for Appendix III, as specified in 30 TAC §352.941 *et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2021)*.
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- Data and statistical analysis not available for the previous reporting period indicated that during the 2nd semi-annual 2022 sampling event (November 2022) with confirmation sampling conducted in February 2023:

  The following Appendix III parameters exceeded background:

  - Boron at AD-23
  - Chloride at AD-36
- A successful ASDs for the Appendix III parameter that exceeded the GWPS for the 2nd semi-annual 2022 was certified on September 5, 2023 and submitted to TCEQ September 5, 2023 for approval.
- During the 1st semi-annual 2023 sampling event (June 2023) with confirmation sampling conducted in August 2023:

  The following Appendix III parameters exceeded background:

  - Calcium at AD-36
  - Chloride at AD-36
- Pirkey Power Plant submitted a Notice of SSI over background to TCEQ (December 21, 2023) which indicated an alternative source demonstration would be conducted. An

alternative source demonstration report will be prepared and certified and submitted to TCEQ's Executive Director for review within 90 days of the SSI determination.

- The 2nd semi-annual event (October 2023) data are still undergoing statistical analysis.
- The background data was re-established on January 25, 2024.
- A statistical process in accordance with 30 TAC §352.931 to evaluate groundwater data was updated, certified, and posted to AEP's CCR website in 2021 titled: AEP's *Statistical Analysis Plan (*Geosyntec 2021). The statistical process was guided by USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* ("Unified Guidance," USEPA, 2009).

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

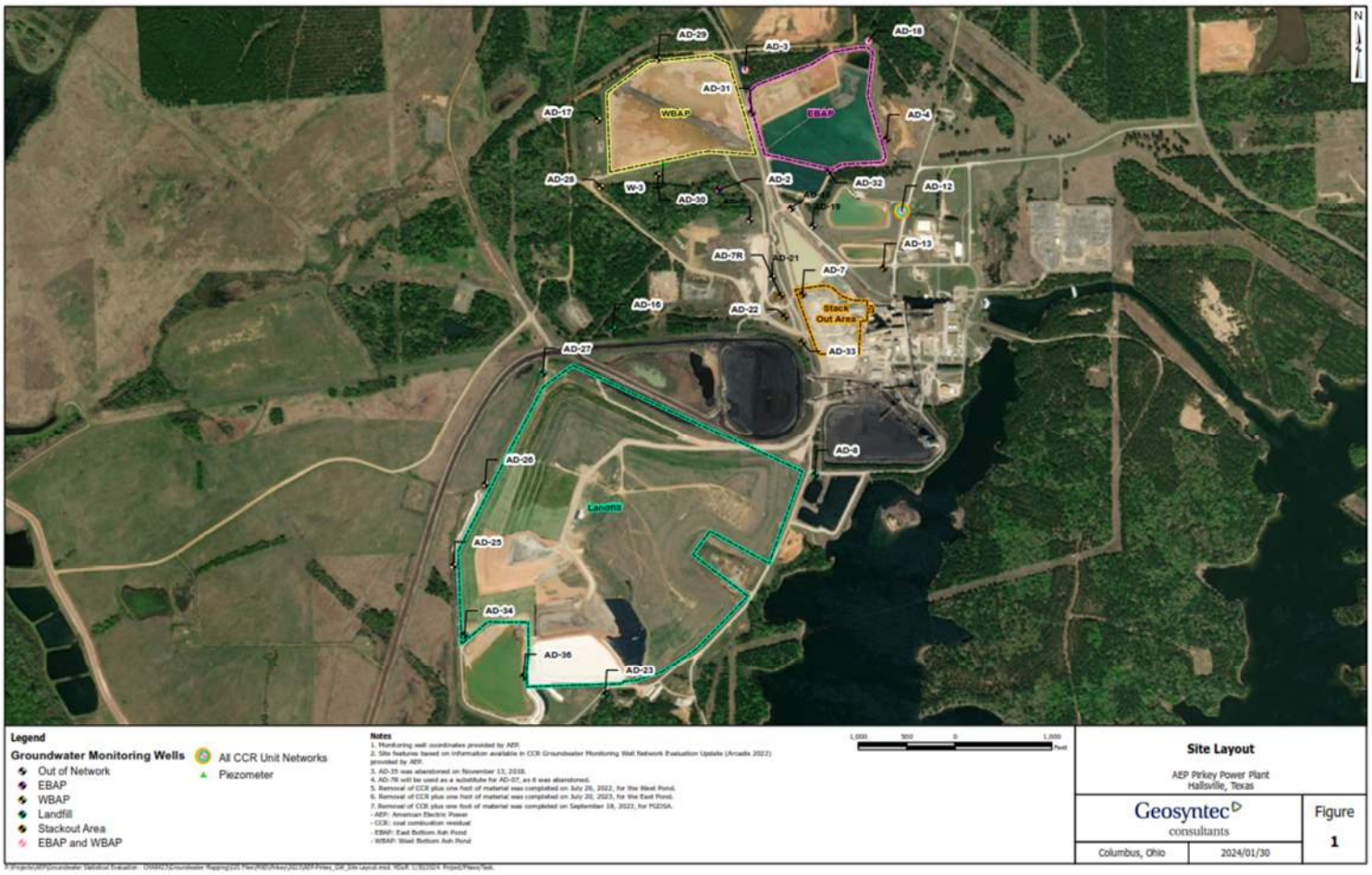
- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of detection monitoring or assessment monitoring programs (Attached as **Appendix 1**);
- Statistical comparison of monitoring data to determine if there have been SSI(s) or SSL(s) (Attached as **Appendix 2**);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**);
- A summary of any transition between monitoring programs, or an alternate monitoring frequency, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a SSI over background concentrations (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 6**);
- Other information required to be included in the annual report such as field sheets, analytical reports, etc. (Attached as **Appendix 4 and 5**)

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

The figure that follows depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers.

Landfill Monitoring Wells	
Upgradient	Downgradient
AD-8	AD-23
AD-12	AD-34
AD-16	AD-35 (decommissioned 2018)
AD-27	AD-36 (installed 2019)



III. Monitoring Wells Installed or Decommissioned

Pirkey Power Plant ceased operation of its coal-fired boilers on March 31, 2023. The Plant is currently being demolished, and one the designated downgradient monitoring wells (AD-7) for the

FGD Stack Out Area was decommissioned during September 2023 because it was located within the boundary (footprint) of the Stack Out Area where demolition activities are occurring.

There were no new groundwater monitoring wells installed during 2023. The network design is summarized in the *Groundwater Monitoring Network Design Report* (January 2021) and is posted at the CCR website for Pirkey Power Plant's LF. That network 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.

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

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

As required by the detection monitoring rules, 30 TAC §352.941 *et seq,* two rounds of sampling were conducted in June and October including all 30 TAC §352 Appendix III parameters.

The groundwater flow rate and direction for the confirmatory sampling events reflect that seen during the semi-annual sampling events.

Detection monitoring will continue in 2024.

V. Groundwater Quality Data Statistical Analysis

Data and statistical analysis not available for the previous reporting period indicated that during the 2nd semi-annual 2022 sampling event (November 2022) with confirmation sampling conducted in February 2023:

The following Appendix III parameters exceeded background:

- Boron at AD-23
- Chloride at AD-36

During the 1st semi-annual 2023 sampling event (June 2023) with confirmation sampling conducted in August 2023:

The following Appendix III parameters exceeded background:

- Calcium at AD-36
- Chloride at AD-36

The 2nd semi-annual event (October 2023) data are still undergoing statistical analysis.

Appendix 2 contains the statistical analysis report(s).

VI. Alternate Source Demonstration

A successful ASDs for the Appendix III parameter that exceeded the GWPS for the 2nd semi-annual 2022 was certified on September 5, 2023 and submitted to TCEQ September 5, 2023 for approval.

Pirkey Power Plant submitted a Notice of SSI over background to TCEQ (December 21. 2023) which indicated an alternative source demonstration would be conducted. An alternative source demonstration report will be prepared and certified and submitted to TCEQ's Executive Director for review within 90 days of the SSI determination.

VII. Discussion About Transition Between Monitoring Requirements or Alternate Monitoring Frequency

No transition was made during the reporting period and the CCR Unit remained in detection monitoring.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production are high enough at this facility that no modification to the semiannual assessment monitoring frequency is needed.

VIII. Other Information Required

The background data was re-established on January 25, 2024.

As required by the CCR detection monitoring rules in 30 TAC §352.941, sampling all LF CCR wells for the 30 TAC §352 Appendix III parameters was completed in 2023.

IX. Description of Any Problems Encountered in 2023 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 covering the year 2023 groundwater monitoring activities.

X. A Projection of Key Activities for the Upcoming Year

Key activities for the next year include:

- Detection monitoring sampling will be conducted;
- Complete the statistical evaluation of the second semi-annual groundwater monitoring event that took place in October 2023;
- Conduct groundwater sampling events for all constituents listed in 30 TAC §352 Appendix III as required by 30 TAC 352.941;
- Perform statistical analysis on the sampling results for the 30 TAC §352 Appendix III parameters as required by 30 TAC 352.941;

- Evaluation of the detection monitoring results from a statistical analysis viewpoint, looking for any SSIs over background;
- Completed ASDs, as needed;
- Responding to any new data received in light of TCEQ CCR rule requirements;
- Preparation of the next annual groundwater report.

APPENDIX 1- Groundwater Data Tables and Figures

Figures and Tables follow, showing the groundwater monitoring data collected, the rate and direction of groundwater flow, and a summary showing the number of samples collected per monitoring well. The dates that the samples were collected also is shown.

Table 1. Groundwater Data Summary: AD-8
Pirkey - LF
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
5/10/2016	Background	1.58	109	9	< 0.083 U1	6.1	181	432
7/13/2016	Background	0.775	20.7	13	2	6.2	131	280
9/8/2016	Background	1.04	50.7	12	2	5.1	121	285
10/12/2016	Background	0.793	20.8	13	2	3.7	184	276
11/15/2016	Background	0.769	17.2	13	3	3.7	208	296
1/11/2017	Background	0.734	18.6	13	3	3.6	228	280
2/28/2017	Background	0.777	18.1	10	2	3.7	157	250
4/11/2017	Background	0.779	17.1	12	3	3.9	168	284
8/23/2017	Detection	0.411	19.4	9	0.587 J1	3.9	56	110
3/21/2018	Assessment	1.03	56.1	8	1.1987	5.7	140	278
8/20/2018	Assessment	0.714	14.5	18	5.1991	3.7	168	300
2/28/2019	Assessment	1.05	103	6.83	0.40	5.7	175	462
5/21/2019	Assessment	1.11	85.5	4.48	0.33	5.9	127	296
8/13/2019	Detection	0.818	27.6	12.7	3.39	4.6	128	260
6/3/2020	Detection	0.783	74.4	11.5	2.45	5.8	196	396
11/3/2020	Detection	0.822	18.5	15.8	2.50	4.1	119	237
5/26/2021	Detection	0.986	93.4	3.28	0.35	5.9	168	390
11/17/2021	Detection	0.693	21.9 M1, P3	15.4	2.31	4.2	97.2	220
6/22/2022	Detection	1.04	37.2 M1	17.0	2.85	5.0	117	270
11/14/2022	Detection	1.03	17.9	23.1	2.04	4.5	119	240
6/27/2023	Detection	0.994	92.7	6.97	0.31	5.8	182	410
10/18/2023	Detection	1.11	19.6	21.9	2.26	4.2	99.4	230

Table 1. Groundwater Data Summary: AD-8
Pirkey - LF
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
5/10/2016	Background	< 0.93 U1	< 1.05 U1	38	1	< 0.07 U1	1	1.80288 J1	0.9155	< 0.083 U1	1.02541 J1	< 0.00013 U1	0.027	< 0.29 U1	15	1.19926 J1
7/13/2016	Background	< 0.93 U1	1.16508 J1	61	7	0.175996 J1	1	20	6.75	2	1.46729 J1	0.032	0.211	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	< 1.05 U1	48	2	< 0.07 U1	0.835837 J1	9	1.658	2	< 0.68 U1	0.018	0.048	< 0.29 U1	3.84567 J1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	1.46586 J1	61	6	< 0.07 U1	0.74214 J1	18	6.72	2	2.30733 J1	0.032	0.112	< 0.29 U1	2.51464 J1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	52	6	0.118693 J1	0.805286 J1	18	6.14	3	2.85553 J1	0.03	0.16	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	1.53134 J1	60	6	0.108717 J1	2	18	6.29	3	2.99592 J1	0.032	0.157	< 0.29 U1	1.4083 J1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	1.68597 J1	52	6	0.13889 J1	0.633257 J1	18	7.64	2	3.26919 J1	0.031	0.153	< 0.29 U1	1.78549 J1	< 0.86 U1
4/11/2017	Background	< 0.93 U1	< 1.05 U1	51	6	0.128137 J1	0.887504 J1	19	5.56	3	2.44168 J1	0.031	0.01068 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	< 1.05 U1	37.9	2.57	< 0.07 U1	< 0.23 U1	9.38	2.499	1.1987	0.95 J1	0.01503	0.049	< 0.29 U1	27.68	< 0.86 U1
8/20/2018	Assessment	0.02 J1	4.05	33.4	4.55	0.18	0.759	15.9	0.145	5.1991	4.46	0.0221	0.105	0.02 J1	9.8	0.083
2/28/2019	Assessment	< 0.4 U1	< 0.6 U1	46.8	< 0.4 U1	< 0.2 U1	< 0.8 U1	0.8 J1	1.066	0.40	< 0.4 U1	0.002 J1	< 0.005 U1	< 8 U1	30.8	< 2 U1
5/21/2019	Assessment	< 0.4 U1	1 J1	42.8	1 J1	< 0.2 U1	< 0.8 U1	< 0.4 U1	1.786	0.33	< 0.4 U1	0.0003 J1	0.009 J1	< 8 U1	23.9	< 0.1 U1

Table 1. Groundwater Data Summary: AD-12
Pirkey - LF
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
5/11/2016	Background	0.03	0.362	5	< 0.083 U1	4.4	4	94
7/13/2016	Background	0.03	0.26	6	< 0.083 U1	3.1	4	75
9/7/2016	Background	0.04	0.343	6	< 0.083 U1	3.9	7	63
10/12/2016	Background	0.03	0.271	7	1	3.4	8	92
11/14/2016	Background	0.04	0.331	8	< 0.083 U1	2.6	6	80
1/11/2017	Background	0.03	0.315	7	< 0.083 U1	4.8	6	76
2/28/2017	Background	0.04	0.434	5	< 0.083 U1	3.6	4	50
4/11/2017	Background	0.05	0.299	6	0.2565 J1	4.7	7	72
8/23/2017	Detection	0.0495	0.245	6	0.213 J1	4.8	6	52
3/21/2018	Assessment	0.01397	0.269	5	< 0.083 U1	4.2	3	< 2 U1
8/20/2018	Assessment	0.017	0.338	10	< 0.083 U1	4.4	4	94
2/27/2019	Assessment	0.03 J1	0.4 J1	6.08	0.09	5.2	3.6	36
5/21/2019	Assessment	0.020	0.3 J1	6.30	0.09	4.1	4.0	80
8/12/2019	Detection	< 0.02 U1	0.278	7.24	0.06 J1	4.9	2.6	90
3/10/2020	Detection	0.02 J1	0.3 J1	6.08	0.10	4.9	3.7	62
6/2/2020	Detection	< 0.02 U1	0.2 J1	5.63	0.10	4.0	3.9	91
11/2/2020	Detection	0.03 J1	0.3 J1	4.65	0.08	4.3	3.3	74
3/8/2021	Detection	0.01 J1	0.2 J1	6.46	0.11	4.1	3.8	68
5/24/2021	Detection	0.032 J1	0.2 J1	5.54	0.12	4.2	5.46	70
11/15/2021	Detection	0.012 J1	0.28	8.03	0.07	3.5	2.90	90
3/28/2022	Detection	0.021 J1	0.20	6.10	0.07	3.9	3.80	60 L1
6/20/2022	Detection	0.042 J1	0.32	7.59	0.09	4.3	4.81	80
11/15/2022	Detection	0.013 J1	0.36	8.03	0.08	4.7	3.39	70
2/27/2023	Detection	0.021 J1	0.34	6.51	0.07	3.8	3.90	70
6/26/2023	Detection	0.019 J1	0.21	4.68	0.06	4.6	2.9	80
8/23/2023	Detection	0.017 J1	0.22	4.74	0.07	3.8	3.5	75
10/17/2023	Detection	0.015 J1	0.27	6.74	0.07	3.8	2.7	58

Table 1. Groundwater Data Summary: AD-12
Pirkey - LF
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
5/11/2016	Background	< 0.93 U1	< 1.05 U1	26	0.219521 J1	< 0.07 U1	0.710981 J1	1.58207 J1	0.2073	< 0.083 U1	< 0.68 U1	< 0.00013 U1	< 0.005 U1	< 0.29 U1	1.73953 J1	< 0.86 U1
7/13/2016	Background	< 0.93 U1	< 1.05 U1	23	0.190337 J1	< 0.07 U1	0.68835 J1	1.29444 J1	2.909	< 0.083 U1	< 0.68 U1	0.008	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	30	0.232192 J1	< 0.07 U1	0.353544 J1	1.66591 J1	0.881	< 0.083 U1	< 0.68 U1	0.01	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	< 1.05 U1	27	0.149553 J1	< 0.07 U1	0.529033 J1	1.56632 J1	0.257	1	< 0.68 U1	0.012	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	< 1.05 U1	28	0.152375 J1	< 0.07 U1	0.32826 J1	1.47282 J1	0.767	< 0.083 U1	< 0.68 U1	0.013	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	< 1.05 U1	23	0.126621 J1	< 0.07 U1	0.650158 J1	1.09495 J1	1.536	< 0.083 U1	< 0.68 U1	0.01	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	< 1.05 U1	26	0.149219 J1	< 0.07 U1	0.325811 J1	1.29984 J1	0.416	< 0.083 U1	< 0.68 U1	0.009	< 0.005 U1	< 0.29 U1	< 0.99 U1	0.994913 J1
4/11/2017	Background	< 0.93 U1	< 1.05 U1	24	0.159412 J1	< 0.07 U1	0.416007 J1	1.33344 J1	0.3895	0.2565 J1	< 0.68 U1	0.008	0.01364 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	< 1.05 U1	25.82	0.16 J1	< 0.07 U1	1.05	1.49 J1	0.784	< 0.083 U1	< 0.68 U1	0.00722	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/20/2018	Assessment	< 0.01 U1	0.11	27.8	0.159	0.01 J1	0.330	1.72	1.128	< 0.083 U1	0.089	0.0143	< 0.005 U1	0.04 J1	0.1	0.04 J1
2/27/2019	Assessment	< 0.4 U1	< 0.6 U1	22.5	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.37	0.225	0.09	< 0.4 U1	0.00688	< 0.005 U1	< 8 U1	< 0.6 U1	< 2 U1
5/21/2019	Assessment	< 0.4 U1	< 0.6 U1	21.7	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.15	0.201	0.09	< 0.4 U1	0.00576	< 0.005 U1	< 8 U1	< 0.6 U1	< 0.1 U1

Table 1. Groundwater Data Summary: AD-16
Pirkey - LF
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
5/10/2016	Background	0.02	1.21	8	< 0.083 U1	3.9	16	116
7/14/2016	Background	0.03	2	9	< 0.083 U1	3.8	45	148
9/8/2016	Background	0.03	1.83	9	< 0.083 U1	3.9	33	133
10/13/2016	Background	0.03	1.15	9	< 0.083 U1	3.9	16	124
11/14/2016	Background	0.03	1.58	9	< 0.083 U1	4.4	23	124
1/12/2017	Background	0.02	1.76	10	< 0.083 U1	3.7	43	112
3/1/2017	Background	0.03	1.29	9	< 0.083 U1	3.2	22	108
4/10/2017	Background	0.02	1.21	11	< 0.083 U1	3.4	24	106
8/24/2017	Detection	0.03648	0.945	12	< 0.083 U1	4.3	14	96
3/22/2018	Assessment	0.0171	1.03	14	< 0.083 U1	4.0	13	96
8/21/2018	Assessment	0.020	1.17	17	< 0.083 U1	4.0	15	128
2/27/2019	Assessment	0.03 J1	0.704	20.3	0.07 J1	4.1	17.7	76
5/23/2019	Assessment	0.022	1.06	20.8	0.06 J1	4.6	26.9	128
8/15/2019	Detection	< 0.02 U1	0.874	20.0	0.06 J1	5.1	15.4	110
6/3/2020	Detection	< 0.02 U1	0.872	21.7	0.11	4.7	13.3	122
11/3/2020	Detection	< 0.02 U1	0.817	19.9	0.07	4.4	11.0	105
5/26/2021	Detection	0.016 J1	0.8	23.2	0.13	4.4	7.36	120
11/17/2021	Detection	0.206	0.94	22.3	0.07	4.3	9.64	110
6/22/2022	Detection	0.021 J1	1.80	24.7	0.10	4.5	9.58	110
11/14/2022	Detection	0.024 J1	0.91	25.2	0.07	4.3	6.68	90
6/27/2023	Detection	0.016 J1	0.79	28.9	0.08	4.4	7.3	120
10/18/2023	Detection	0.026 J1	1.13	22.0	0.07	4.2	9.3	97

Table 1. Groundwater Data Summary: AD-16
Pirkey - LF
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
5/10/2016	Background	< 0.93 U1	1.83497 J1	61	0.453643 J1	0.0817904 J1	1	4.23727 J1	1.294	< 0.083 U1	< 0.68 U1	0.006	0.01506 J1	< 0.29 U1	2.26113 J1	1.3697 J1
7/14/2016	Background	< 0.93 U1	< 1.05 U1	64	0.565692 J1	< 0.07 U1	1	6	1.438	< 0.083 U1	< 0.68 U1	0.036	0.02395 J1	1.1177 J1	< 0.99 U1	< 0.86 U1
9/8/2016	Background	8	< 1.05 U1	70	0.810547 J1	0.0926258 J1	2	8	1.931	< 0.083 U1	< 0.68 U1	0.032	0.00753 J1	< 0.29 U1	< 0.99 U1	1.75243 J1
10/13/2016	Background	< 0.93 U1	1.52475 J1	56	0.250902 J1	< 0.07 U1	1	3.33761 J1	1.843	< 0.083 U1	< 0.68 U1	0.033	< 0.005 U1	< 0.29 U1	1.70284 J1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	< 1.05 U1	55	0.38481 J1	< 0.07 U1	0.561291 J1	4.34297 J1	2.123	< 0.083 U1	< 0.68 U1	0.028	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	58	0.70928 J1	< 0.07 U1	0.406161 J1	8	2.629	< 0.083 U1	< 0.68 U1	0.031	0.01045 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	1.50766 J1	76	0.487946 J1	< 0.07 U1	0.558767 J1	5	1.417	< 0.083 U1	< 0.68 U1	0.021	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	77	0.435552 J1	< 0.07 U1	0.822329 J1	5	0.932	< 0.083 U1	< 0.68 U1	0.019	0.00733 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	83.66	0.27 J1	< 0.07 U1	1.59	3.6 J1	2.11	< 0.083 U1	< 0.68 U1	0.02224	0.018 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	0.03 J1	0.42	69.0	0.213	0.03	0.211	3.78	1.92	< 0.083 U1	0.082	0.0347	0.014 J1	< 0.02 U1	0.1	0.051
2/27/2019	Assessment	< 0.4 U1	7.74	56.2	< 0.4 U1	< 0.2 U1	< 0.8 U1	3.21	0.848	0.07 J1	< 0.4 U1	0.0154	0.011 J1	< 8 U1	< 0.6 U1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	5.80	83.4	< 0.4 U1	< 0.2 U1	< 0.8 U1	3.16	1.957	0.06 J1	< 0.4 U1	0.0227	< 0.005 U1	< 8 U1	< 0.6 U1	< 0.1 U1

Table 1. Groundwater Data Summary: AD-23
Pirkey - LF
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
5/10/2016	Background	0.01	0.535	4	< 0.083 U1	4.0	10	72
7/13/2016	Background	0.03	0.317	4	< 0.083 U1	2.7	11	59
9/8/2016	Background	0.02	0.26	5	< 0.083 U1	3.5	12	64
10/12/2016	Background	0.03	0.321	6	< 0.083 U1	3.7	13	68
11/15/2016	Background	0.03	0.249	5	< 0.083 U1	3.5	14	100
1/11/2017	Background	0.02	0.319	6	< 0.083 U1	3.7	13	60
2/28/2017	Background	0.03	0.217	4	< 0.083 U1	4.0	9	48
4/11/2017	Background	0.03	0.543	7	0.2688 J1	4.2	11	76
8/23/2017	Detection	0.04021	0.276	6	0.198 J1	4.1	11	64
12/21/2017	Detection	0.04498	0.469	--	--	--	--	--
3/21/2018	Assessment	0.01762	0.227	4	< 0.083 U1	3.9	10	72
8/20/2018	Assessment	0.017	0.247	9	< 0.083 U1	3.8	11	92
2/28/2019	Assessment	0.02 J1	0.3 J1	6.94	0.04 J1	5.1	7.2	70
5/23/2019	Assessment	0.017	0.3 J1	6.82	0.04 J1	4.8	9.1	54
8/13/2019	Detection	< 0.02 U1	0.325	7.12	0.03 J1	5.0	7.4	126
1/27/2020	Detection	--	--	--	--	4.3	--	70 J1
6/3/2020	Detection	< 0.02 U1	0.2 J1	7.08	0.07	4.3	8.5	65
11/4/2020	Detection	< 0.02 U1	0.2 J1	6.97	0.05 J1	3.9	7.9	71
5/26/2021	Detection	0.023 J1	0.3	6.94	0.06	3.6	7.90	70
11/17/2021	Detection	0.045 J1	0.22	7.11	0.05 J1	3.9	7.84	70
1/26/2022	Detection	0.040 J1	--	--	--	4.1	--	--
6/22/2022	Detection	0.057	0.25	7.32	0.07	3.6	9.52	80
8/30/2022	Detection	0.032 J1	--	--	--	3.9	--	--
11/14/2022	Detection	0.078	0.24	7.49	0.06	4.5	8.03	80
2/28/2023	Detection	0.049 J1	--	--	--	4.4	--	--
6/27/2023	Detection	0.061	0.44	7.55	0.04 J1	4.5	7.7	70
8/23/2023	Detection	0.026 J1	--	--	--	4.4	--	--
10/18/2023	Detection	0.051	0.26	7.99	0.05 J1	4.0	7.7	44 J1

Table 1. Groundwater Data Summary: AD-23
Pirkey - LF
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
5/10/2016	Background	2.89148 J1	1.65098 J1	48	0.186855 J1	0.0739811 J1	2	2.29646 J1	6.86	< 0.083 U1	< 0.68 U1	0.000135818 J1	0.01188 J1	< 0.29 U1	1.91991 J1	< 0.86 U1
7/13/2016	Background	3.79558 J1	< 1.05 U1	48	0.192156 J1	0.0925427 J1	2	2.72879 J1	5.69	< 0.083 U1	< 0.68 U1	0.006	0.01721 J1	1.34973 J1	2.00038 J1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	< 1.05 U1	53	0.20435 J1	< 0.07 U1	5	2.01019 J1	6.68	< 0.083 U1	2.23756 J1	0.006	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/12/2016	Background	1.29835 J1	7	120	0.463688 J1	0.13648 J1	41	3.91303 J1	12.89	< 0.083 U1	31	1.01	0.095	0.563586 J1	2.10924 J1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	50	0.129296 J1	< 0.07 U1	6	1.66943 J1	7.54	< 0.083 U1	3.21271 J1	0.006	0.02438 J1	0.403857 J1	1.34763 J1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	2.03681 J1	73	0.159 J1	< 0.07 U1	15	2.25934 J1	8.06	< 0.083 U1	11	0.009	0.092	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	1.65681 J1	< 1.05 U1	41	0.116844 J1	< 0.07 U1	0.295768 J1	1.05228 J1	5.74	< 0.083 U1	< 0.68 U1	0.005	< 0.005 U1	< 0.29 U1	1.3076 J1	< 0.86 U1
4/11/2017	Background	< 0.93 U1	3.9673 J1	86	0.318917 J1	0.107977 J1	22	2.60853 J1	10.31	0.2688 J1	15	0.01	0.118	0.31517 J1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	< 1.05 U1	56.1	0.17 J1	< 0.07 U1	5.7	1.09 J1	7.55	< 0.083 U1	3.52 J1	0.00709	0.02 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/20/2018	Assessment	0.03 J1	0.87	53.5	0.147	0.01 J1	1.77	0.803	11	< 0.083 U1	4.79	0.00634	0.025	0.07 J1	1.0	0.176
2/28/2019	Assessment	< 0.4 U1	1 J1	46.9	< 0.4 U1	< 0.2 U1	4.16	1 J1	6.14	0.04 J1	3.46	0.00646	0.035	< 8 U1	1 J1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	0.7 J1	56.4	< 0.4 U1	< 0.2 U1	3 J1	0.7 J1	9.66	0.04 J1	8.99	0.00537	0.058 J1	< 8 U1	< 0.6 U1	0.2 J1

Table 1. Groundwater Data Summary: AD-27
Pirkey - LF
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
5/11/2016	Background	0.02	4.41	8	0.6176 J1	3.9	51	198
7/13/2016	Background	0.03	4.43	8	< 0.083 U1	2.7	54	192
9/8/2016	Background	0.03	4.17	8	< 0.083 U1	2.9	52	196
10/12/2016	Background	0.03	4.09	8	< 0.083 U1	3.0	58	216
11/15/2016	Background	0.03	4.52	8	< 0.083 U1	3.5	92	216
1/11/2017	Background	0.02	3.74	9	< 0.083 U1	4.1	58	180
3/1/2017	Background	0.03	4.31	8	< 0.083 U1	2.8	56	216
4/10/2017	Background	0.03	4.01	9	< 0.083 U1	3.3	54	180
8/24/2017	Detection	0.0358	3.58	9	0.197 J1	3.7	52	168
3/22/2018	Assessment	0.03901	5.58	11	< 0.083 U1	3.9	78	192
8/21/2018	Assessment	0.024	4.58	10	< 0.083 U1	3.5	65	196
2/28/2019	Assessment	0.07 J1	4.02	11.7	0.20	4.7	52.8	42
5/23/2019	Assessment	0.023	3.89	11.4	0.20	4.4	55.2	204
8/16/2019	Detection	0.02 J1	3.94	10.5	0.18	3.9	53.2	198
6/3/2020	Detection	0.03 J1	3.55	12.8	0.25	4.2	54.6	219
11/3/2020	Detection	0.03 J1	3.45	10.8	0.19	3.6	53.1	196
5/26/2021	Detection	0.029 J1	3.6	13.5	0.25	3.5	50.8	230
11/17/2021	Detection	0.040 J1	3.76	11.6	0.20	3.7	56.4	190 P1
6/22/2022	Detection	0.028 J1	3.88	12.5	0.22	3.3	57.2	210
11/14/2022	Detection	0.034 J1	3.79	12.7	0.20	4.0	59.4	180
6/27/2023	Detection	0.032 J1	3.86	13.6	0.14	4.2	59.9	210
10/18/2023	Detection	0.040 J1	3.76	12.1	0.19	3.4	61.5	180

Table 1. Groundwater Data Summary: AD-27
Pirkey - LF
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
5/11/2016	Background	1.20808 J1	2.15232 J1	43	5	0.431235 J1	0.87101 J1	20	2.031	0.6176 J1	< 0.68 U1	0.066	< 0.005 U1	< 0.29 U1	1.10872 J1	< 0.86 U1
7/13/2016	Background	0.956365 J1	1.27952 J1	45	5	0.434627 J1	2	21	2.406	< 0.083 U1	< 0.68 U1	0.097	0.02241 J1	0.434679 J1	< 0.99 U1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	< 1.05 U1	47	6	0.398469 J1	2	20	2.71	< 0.083 U1	< 0.68 U1	0.095	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	2.14429 J1	46	5	0.424977 J1	2	20	4.43	< 0.083 U1	< 0.68 U1	0.096	< 0.005 U1	< 0.29 U1	1.35863 J1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	41	5	0.419182 J1	2	22	3.69	< 0.083 U1	< 0.68 U1	0.095	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	1.56781 J1	46	5	0.30207 J1	1	18	2.62	< 0.083 U1	< 0.68 U1	0.1	0.00659 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	< 1.05 U1	43	5	0.286804 J1	2	21	3.48	< 0.083 U1	< 0.68 U1	0.1	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	45	5	0.414787 J1	0.954802 J1	21	2.58	< 0.083 U1	< 0.68 U1	0.104	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	40.53	5.29	0.48 J1	3.09	25.63	2.808	< 0.083 U1	< 0.68 U1	0.108	0.012 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	0.02 J1	1.71	39.5	4.90	0.46	1.14	24.6	2.619	< 0.083 U1	0.296	0.0921	0.006 J1	0.07 J1	3.7	0.137
2/28/2019	Assessment	< 0.4 U1	1 J1	39.5	5.32	0.5 J1	< 0.8 U1	18.9	2.95	0.20	< 0.4 U1	0.0892	< 0.005 U1	< 8 U1	2 J1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	< 0.6 U1	41.0	5.22	0.3 J1	< 0.8 U1	19.9	3.93	0.20	< 0.4 U1	0.0885	< 0.005 U1	< 8 U1	0.6 J1	0.2 J1

Table 1. Groundwater Data Summary: AD-34
Pirkey - LF
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
5/10/2016	Background	0.08	37.8	7	< 0.083 U1	4.0	974	1,516
7/13/2016	Background	0.111	33.2	8	< 0.083 U1	3.6	837	1,396
9/8/2016	Background	0.09	39.5	8	< 0.083 U1	3.3	870	1,520
10/12/2016	Background	0.09	35.8	7	0.6272 J1	3.6	1,084	1,464
11/15/2016	Background	0.1	36.3	7	0.9978 J1	3.7	1,006	1,428
1/11/2017	Background	0.07	39.9	8	< 0.083 U1	3.2	1,334	1,378
2/28/2017	Background	0.08	37	6	< 0.083 U1	3.7	993	1,402
4/10/2017	Background	0.09	38.2	8	0.5241 J1	3.0	1,016	1,490
8/23/2017	Detection	0.107	36.2	7	0.619 J1	3.7	1,231	1,128
12/21/2017	Detection	--	--	8	0.6669 J1	--	1,020	1,260
3/21/2018	Assessment	0.171	40.1	6	< 0.083 U1	3.7	956	1,424
8/20/2018	Assessment	0.067	37.0	10	< 0.083 U1	3.7	1,064	1,462
2/27/2019	Assessment	0.08 J1	39.9	7.64	0.86	2.9	970	1,470
5/21/2019	Assessment	0.060	42.0	7.34	0.69	3.3	1,080	1,154
8/13/2019	Detection	0.070	39.8	7.46	1.13	3.7	1,060	1,648
1/27/2020	Detection	--	--	--	0.9	3.6	--	1,550
3/11/2020	Detection	--	--	--	--	3.6	--	--
6/3/2020	Detection	0.058	40.1	7.68	1.22	3.4	1,150	1,620
7/15/2020	Detection	--	--	--	1.39	4.1	--	1,510
11/4/2020	Detection	0.060	39.5	7.10	0.82	3.4	1,090	1,670
5/26/2021	Detection	0.063	39.7	7.44	2.1	2.9	1,110	1,670
7/27/2021	Detection	--	--	--	0.82	3.2	--	--
11/17/2021	Detection	0.069	45.8	7.09	1.11	3.1	1,280	1,850
1/26/2022	Detection	--	42.6	--	--	3.4	--	1,720 S7
6/22/2022	Detection	0.066	45.8	7.38	1.20	3.7	1,260	1,750
8/30/2022	Detection	--	46.0	--	--	4.0	--	1,650
11/14/2022	Detection	0.067	44.6	7.47	0.44	3.5	1,250	1,720
2/28/2023	Detection	--	41.9	--	--	3.8	--	1,640
6/27/2023	Detection	0.057	40.1	7.18	0.63	3.7	1,230	1,710
8/23/2023	Detection	--	--	--	--	3.8	--	1,560
10/18/2023	Detection	0.057	34.6	7.33	0.74	3.3	1,160	1,620

Table 1. Groundwater Data Summary: AD-34
Pirkey - LF
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
5/10/2016	Background	< 0.93 U1	12	72	3	6	34	301	9.64	< 0.083 U1	12	0.176	0.105	0.688222 J1	< 0.99 U1	< 0.86 U1
7/13/2016	Background	< 0.93 U1	25	177	4	6	81	296	7.75	< 0.083 U1	39	0.183	0.313	2.11044 J1	7	< 0.86 U1
9/8/2016	Background	< 0.93 U1	9	31	3	8	12	306	7.91	< 0.083 U1	1.01746 J1	0.158	0.064	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	10	39	3	5	15	297	10.12	0.6272 J1	3.69632 J1	0.174	0.036	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	7	23	2	8	6	292	13.21	0.9978 J1	< 0.68 U1	0.154	0.025	< 0.29 U1	4.50827 J1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	6	29	2	7	8	284	11.9	< 0.083 U1	< 0.68 U1	0.164	0.032	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	7	11	2	6	< 0.23 U1	294	9.87	< 0.083 U1	< 0.68 U1	0.158	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	4.49903 J1	23	2	11	7	299	2.407	0.5241 J1	< 0.68 U1	0.167	0.0164 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	6.51	10.6	2.24	11.97	< 0.23 U1	279	8.85	< 0.083 U1	< 0.68 U1	0.156	< 0.005 U1	< 0.29 U1	3.24 J1	< 0.86 U1
8/20/2018	Assessment	0.01 J1	14.4	7.77	1.77	4.34	0.977	249	10.17	< 0.083 U1	1.32	0.114	0.005 J1	0.03 J1	13.0	0.070
2/27/2019	Assessment	< 0.4 U1	15.9	9.93	2.42	4.57	0.9 J1	260	8.56	0.86	1 J1	0.153	0.015 J1	< 8 U1	14.8	< 2 U1
5/21/2019	Assessment	< 0.4 U1	12.7	10.5	2.25	4.48	0.8 J1	272	10.82	0.69	1 J1	0.158	< 0.005 U1	< 8 U1	4.9	< 0.1 U1

Table 1. Groundwater Data Summary: AD-36
Pirkey - LF
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
8/13/2019	Background	0.065	0.240	9.46	0.05 J1	4.7	2.2	92
1/27/2020	Background	0.056	0.304	8.65	0.05 J1	4.7	3.5	40 J1
3/11/2020	Background	0.05 J1	0.2 J1	8.44	0.06	5.0	3.7	60 J1
4/15/2020	Background	0.054	0.2 J1	8.40	0.05 J1	3.6	3.7	40 J1
5/13/2020	Background	0.055	0.2 J1	8.56	0.05 J1	4.1	3.4	40 J1
6/3/2020	Background	0.052	0.2 J1	8.52	0.07	4.6	3.3	65
6/16/2020	Background	0.064	0.2 J1	8.39	0.05 J1	4.6	3.6	50 J1
7/1/2020	Background	0.059	0.3 J1	--	--	4.9	--	52
7/15/2020	Background	--	--	8.09	0.08	5.0	3.7	--
11/4/2020	Detection	0.068	0.2 J1	7.99	0.06 J1	4.6	3.1	57
5/26/2021	Detection	0.057	0.6	10.6	0.10	4.0	4.08	60
7/27/2021	Detection	--	0.3	8.67	0.07	3.9	--	--
11/17/2021	Detection	0.070	0.25	8.97	0.05 J1	4.0	2.89	50 P1
6/22/2022	Detection	0.059	0.38	10.1	0.09	4.6	5.00	60
8/30/2022	Detection	--	0.28	10.3	0.07	4.9	3.00	--
11/14/2022	Detection	0.068	0.28	11.1	0.07	4.5	2.93	50
2/28/2023	Detection	--	--	11.7	--	4.5	--	--
6/27/2023	Detection	0.067	0.88	11.1	0.06	4.0	3.6	60 P1
8/23/2023	Detection	--	1.22	11.8	--	4.2	--	--
10/18/2023	Detection	0.081	0.76	12.4	0.07	4.2	3.1	52

Table 1. Groundwater Data Summary: AD-36
Pirkey - LF
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
8/13/2019	Background	< 0.02 U1	0.15	10.8	0.234	< 0.01 U1	0.203	0.901	1.298	0.05 J1	< 0.05 U1	0.0161	< 0.005 U1	< 0.4 U1	0.09 J1	< 0.1 U1
1/27/2020	Background	< 0.02 U1	0.14	9.94	0.191	0.01 J1	0.09 J1	0.762	1.096	0.05 J1	< 0.05 U1	0.00277	< 0.2 U1	< 0.4 U1	0.07 J1	< 0.1 U1
3/11/2020	Background	< 0.02 U1	0.09 J1	10.2	0.184	< 0.01 U1	< 0.04 U1	0.760	4.056	0.06	< 0.05 U1	0.00246	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
4/15/2020	Background	< 0.02 U1	0.10	10.1	0.179	< 0.01 U1	0.1 J1	0.770	2.84	0.05 J1	< 0.05 U1	0.00210	0.003 J1	0.8 J1	0.09 J1	< 0.1 U1
5/13/2020	Background	< 0.02 U1	0.15	10.2	0.194	< 0.01 U1	0.247	0.750	2.346	0.05 J1	< 0.05 U1	0.00266	0.004 J1	< 0.4 U1	0.08 J1	< 0.1 U1
6/3/2020	Background	< 0.02 U1	0.11	9.81	0.204	< 0.01 U1	0.08 J1	0.683	0.692	0.07	< 0.05 U1	0.00262	0.005 J1	< 0.4 U1	0.09 J1	< 0.1 U1
6/16/2020	Background	< 0.02 U1	0.11	9.75	0.173	< 0.01 U1	0.214	0.723	0.885	0.05 J1	0.08 J1	0.00254	0.003 J1	1 J1	0.1 J1	< 0.1 U1
7/1/2020	Background	< 0.02 U1	0.09 J1	9.72	0.179	< 0.01 U1	0.09 J1	0.681	1.171	--	< 0.05 U1	0.00268	0.004 J1	< 0.4 U1	0.06 J1	< 0.1 U1
7/15/2020	Background	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--

Notes:
- -: Not analyzed
<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.
In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.
J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.
L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
P1: The precision between duplicate results was above acceptance limits.
P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.
pCi/L: picocuries per liter
S7: Sample did not achieve constant weight.
SU: standard unit
µg/L: micrograms per liter

Table 1. Groundwater Elevation Data Summary
Pirkey Power Plant

Geosyntec Consultants

Unit	All Units	East Bottom Ash Pond					West Bottom Ash Pond				
Gradient	Upgradient	Upgradient		Downgradient			Upgradient		Downgradient		
Well	AD-12	AD-4	AD-18	AD-2	AD-31	AD-32	AD-3	AD-18	AD-17	AD-28	AD-30
Jan-2016	371.05	359.16	360.52	328.55	346.60	352.32	347.03	360.52	--	321.39	323.70
May-2016	372.17	360.07	359.26	328.35	348.21	352.74	348.04	359.26	329.38	321.82	324.26
Jul-2016	365.68	352.34	356.99	327.46	345.46	348.53	346.00	356.99	325.93	320.44	322.49
Jan-2017	365.11	353.27	357.06	327.65	343.78	347.44	344.19	357.06	324.70	320.27	322.23
Feb-2017	368.79	355.32	359.21	327.96	344.53	348.44	345.53	359.21	326.27	320.59	322.88
Apr-2017	372.97	356.62	358.63	329.09	344.58	349.09	345.53	358.63	326.27	320.69	322.88
Aug-2017	367.68	353.58	358.23	327.63	343.57	349.73	343.49	358.23	324.18	320.07	322.04
Mar-2018	370.57	359.04	360.00	328.36	344.10	351.42	344.56	360.00	327.13	321.79	323.29
Aug-2018	357.99	350.39	355.99	326.99	342.73	347.58	343.28	355.99	324.12	319.93	321.70
Feb-2019	372.43	360.40	354.61	329.21	348.31	352.86	348.36	354.61	331.11	321.86	324.54
May-2019	373.12	361.18	360.74	328.91	349.68	354.14	349.37	360.74	331.66	322.61	325.21
Aug-2019	361.90	354.10	357.09	327.60	346.63	353.12	346.08	357.09	326.45	320.40	322.63
Mar-2020	373.10	360.56	360.58	329.23	346.95	352.55	347.22	360.58	336.07	321.98	323.94
Jun-2020	381.55	360.25	359.98	328.06	347.95	352.87	347.76	359.98	328.04	321.28	323.40
Nov-2020	361.86	349.70	354.98	327.57	342.84	346.13	342.89	354.98	324.36	319.99	321.90
Mar-2021	373.52	359.14	359.99	329.00	346.24	350.30	346.58	359.99	329.37	322.06	324.19
May-2021	375.56	360.45	360.46	329.57	347.27	351.28	347.46	360.46	329.03	323.10	324.94
Jul-2021	--	--	--	--	--	--	--	--	--	--	--
Nov-2021	358.32	351.40	355.55	327.36	342.79	348.72	342.60	355.55	323.77	319.98	321.80
Jan-2022	--	--	--	--	--	--	--	--	--	--	--
Mar-2022	373.28	359.58	359.17	328.17	344.58	351.73	344.19	359.17	325.80	321.05	323.14
Jun-2022	360.55	351.31	356.01	327.07	342.36	349.94	342.22	356.01	323.48	320.11	321.54
Aug-2022	--	--	--	--	--	--	341.84	--	--	--	--
Nov-2022	363.46	351.15	355.11	327.52	341.97	348.00	340.85	355.11	322.61	319.73	321.81
Feb-2023	368.74	356.04	359.57	328.12	344.34	349.48	--	359.57	--	--	--
Mar-2023	--	--	--	--	--	--	--	--	--	--	--
Jun-2023	369.17	352.66	357.96	327.55	340.46	343.36	341.82	357.96	325.13	320.45	322.07
Aug-2023	362.47	347.25	354.17	326.59	337.74	341.46	--	354.17	--	--	--
Oct-2023	360.29	--	352.80	--	--	--	338.07	352.80	322.93	319.77	321.28

Notes:
1. Groundwater elevation measured in feet above mean sea level.

Table 1. Groundwater Elevation Data Summary
Pirkey Power Plant

Geosyntec Consultants

Unit	Stackout Pad				Landfill					
Gradient	Upgradient	Downgradient			Upgradient			Downgradient		
Well	AD-13	AD-7	AD-22	AD-33	AD-8	AD-16	AD-27	AD-23	AD-34	AD-36
Jan-2016	354.15	349.31	350.29	351.13	347.21	347.68	--	321.23	307.61	--
May-2016	355.11	349.98	350.83	351.62	348.03	350.97	335.29	321.98	307.61	--
Jul-2016	352.31	347.54	347.55	349.88	347.10	343.32	331.47	321.97	307.61	--
Jan-2017	352.01	347.04	347.20	348.56	345.74	343.09	330.04	320.99	307.61	--
Feb-2017	352.81	347.96	348.52	349.32	346.00	344.54	331.59	321.00	307.61	--
Apr-2017	352.68	347.87	348.45	349.25	345.81	344.69	331.24	320.85	307.61	--
Aug-2017	352.62	347.40	347.37	349.31	346.31	342.71	330.05	320.77	307.61	--
Mar-2018	353.25	348.46	349.62	350.10	346.11	344.63	332.49	320.17	307.61	--
Aug-2018	349.14	344.57	344.05	347.23	345.24	340.03	328.61	320.31	306.66	--
Feb-2019	355.63	350.21	350.90	351.99	348.05	351.21	335.03	320.88	307.61	--
May-2019	355.87	350.82	351.99	352.95	348.60	351.92	336.53	320.99	--	--
Aug-2019	350.87	346.85	346.70	349.96	347.33	343.92	330.71	321.29	305.87	303.16
Mar-2020	355.71	350.64	351.80	352.68	--	--	--	--	DRY	303.21
Jun-2020	355.17	350.25	350.95	352.54	348.61	349.39	--	320.79	307.61	303.78
Nov-2020	350.93	346.45	346.12	348.71	346.63	343.07	329.77	320.83	307.00	302.88
Mar-2021	355.22	350.13	351.33	351.84	--	--	--	--	--	--
May-2021	356.42	350.97	352.31	352.95	348.58	350.52	337.25	320.32	307.61	302.22
Jul-2021	--	--	--	--	--	--	--	--	307.61	302.42
Nov-2021	349.43	345.08	345.25	348.40	346.48	341.99	329.69	320.49	307.20	301.66
Jan-2022	--	--	--	--	--	--	--	320.00	307.61	--
Mar-2022	353.99	348.66	349.66	350.15	--	--	--	--	307.61	--
Jun-2022	349.75	345.35	345.49	348.35	346.27	342.41	330.10	319.87	307.00	301.49
Aug-2022	--	--	--	--	--	--	--	319.81	306.84	301.35
Nov-2022	349.93	345.56	345.20	347.43	344.23	341.65	328.48	319.72	307.61	301.35
Feb-2023	353.36	348.68	349.47	350.18	--	--	--	319.56	307.61	301.51
Mar-2023	354.24	--	350.03	350.48	--	--	--	--	--	--
Jun-2023	352.47	347.83	348.29	349.81	346.88	342.44	332.67	320.13	--	299.99
Aug-2023	--	--	--	--	--	--	--	320.39	307.61	302.91
Oct-2023	348.85	--	344.70	346.93	345.07	339.45	328.43	320.35	307.61	300.48

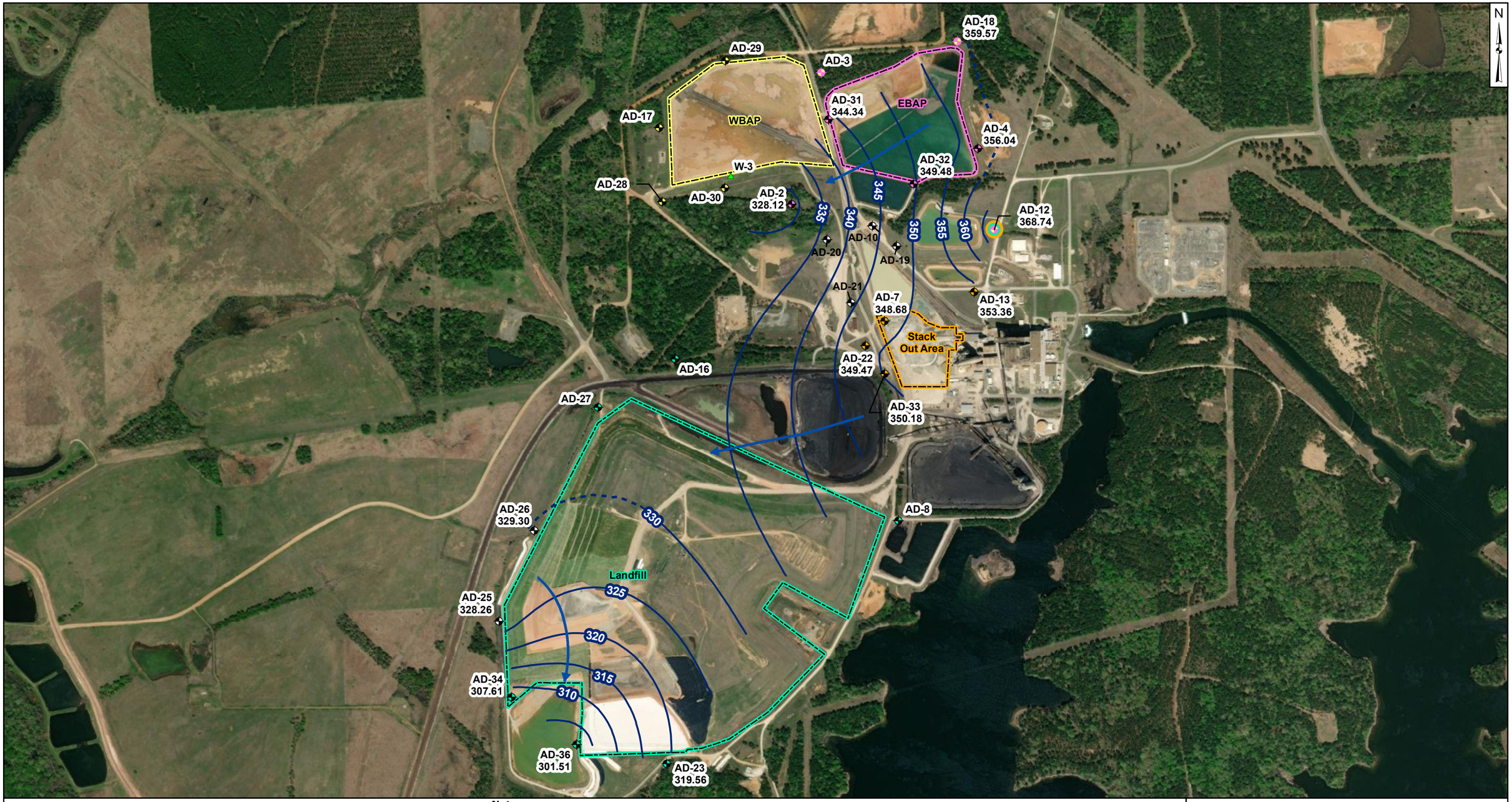
Notes:
1. Groundwater elevation measured in feet above mean sea level.

Table 1: Residence Time Calculation Summary
Pirkey Landfill

Geosyntec Consultants, Inc.

			2023-02[3]		2023-06		2023-08[3]		2023-10	
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)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Landfill	AD-8 [1]	4.0	NC	NC	7.0	17.4	NC	NC	7.3	16.6
	AD-12 [1]	4.0	35.7	3.4	44.0	2.8	30.4	4.0	20.3	6.0
	AD-16 [1]	2.0	NC	NC	19.3	3.2	NC	NC	18.4	3.3
	AD-23 [2]	2.0	21.9	2.8	23.8	2.6	20.8	2.9	9.9	6.1
	AD-27 [1]	2.0	NC	NC	11.8	5.1	NC	NC	13.8	4.4
	AD-34 [2]	2.0	27.4	2.2	28.0	2.2	3.5	17.3	24.6	2.5
	AD-36 [2]	2.0	26.3	2.3	29.2	2.1	21.9	2.8	28.0	2.2

Notes:
[1] - Background Well
[2] - Downgradient Well
[3] - Only select wells were gauged as part of two-of-two verification sampling
NC - Not Calculated



Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Groundwater Elevation Contours (Inferred)
- Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on February 27 and 28, 2023) provided by American Electric Power (AEP).
2. Site features based on information available in coal combustion residuals (CCR)Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level.
4. AD-3, AD-8, AD-10, AD-16, AD-17, AD-19, AD-20, AD-21, AD-27, AD-28, AD-29, AD-30, and W-3 were not gauged during the February 2023 event.
5. AD-35 was abandoned on November 13, 2018.
6. Removal of CCR plus one foot of material was completed on July 26, 2022 for the West Bottom Ash Pond (WBAP).

EBAP: East Bottom Ash Pond.

1,000 500 0 1,000 Feet

STATE OF TEXAS
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Beth Ann Gross
November 9, 2023

Geosyntec Consultants, Inc.
Texas Firm
Registration No. 1182

Potentiometric Contours: Uppermost Aquifer
February 2023

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2023/10/05

Figure 1

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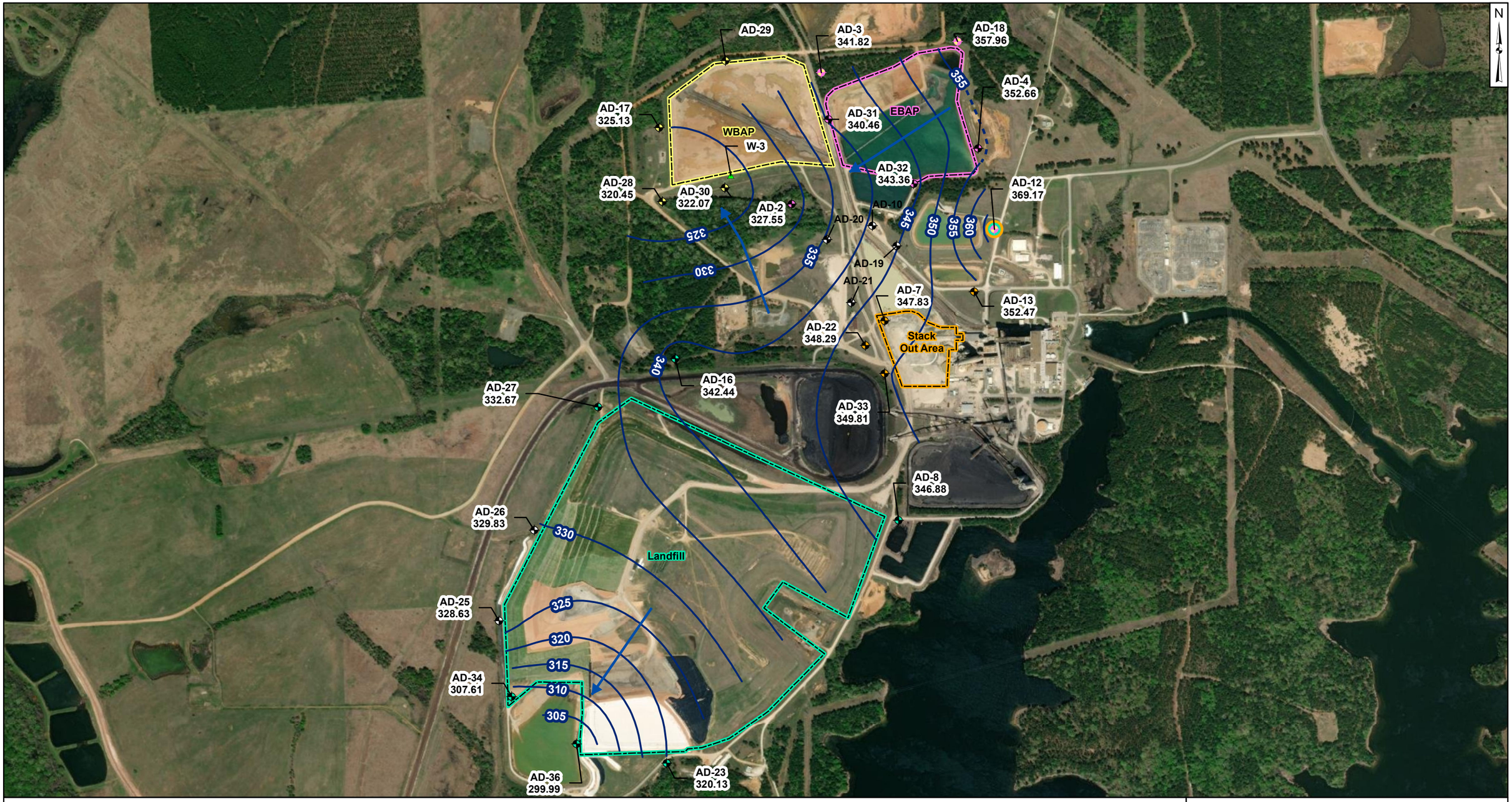

Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Groundwater Elevation Contours (Inferred)
- Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on June 26 and 27, 2023) provided by American Electric Power (AEP).
2. Site features based on information available in coal combustion residuals (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level.
4. AD-10, AD-19, AD-20, AD-21, AD-29, and W-3 were not gauged during the June 2023 event.
5. AD-35 was abandoned on November 13, 2018.
6. Removal of CCR plus one foot of material was completed on July 26, 2022 for the West Bottom Ash Pond (WBAP).

EBAP: East Bottom Ash Pond.

1,000 500 0 1,000 Feet

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November 9, 2023

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Potentiometric Contours: Uppermost Aquifer
June 2023

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2023/10/06

Figure **2**

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Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP

- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Groundwater Elevation Contours (Inferred)
- Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on August 23, 2023) provided by American Electric Power (AEP).
2. Site features based on information available in coal combustion residuals (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level.
4. AD-03, AD-07, AD-08, AD-13, AD-16, AD-17, AD-22, AD-25, AD-26, AD-27, AD-28, AD-29, AD-30, AD-33 and W-3 were not gauged during the August 2023 event.
5. AD-35 was abandoned on November 13, 2018.
6. Removal of CCR plus one foot of material was completed on July 26, 2022 for the West Bottom Ash Pond (WBAP).
7. Removal of CCR plus one foot of material was completed on July 20, 2023 for the East Bottom Ash Pond (EBAP).

1,000 500 0 1,000 Feet

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November 9, 2023

Geosyntec Consultants, Inc.
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Registration No. 1182

Potentiometric Contours: Uppermost Aquifer
August 2023

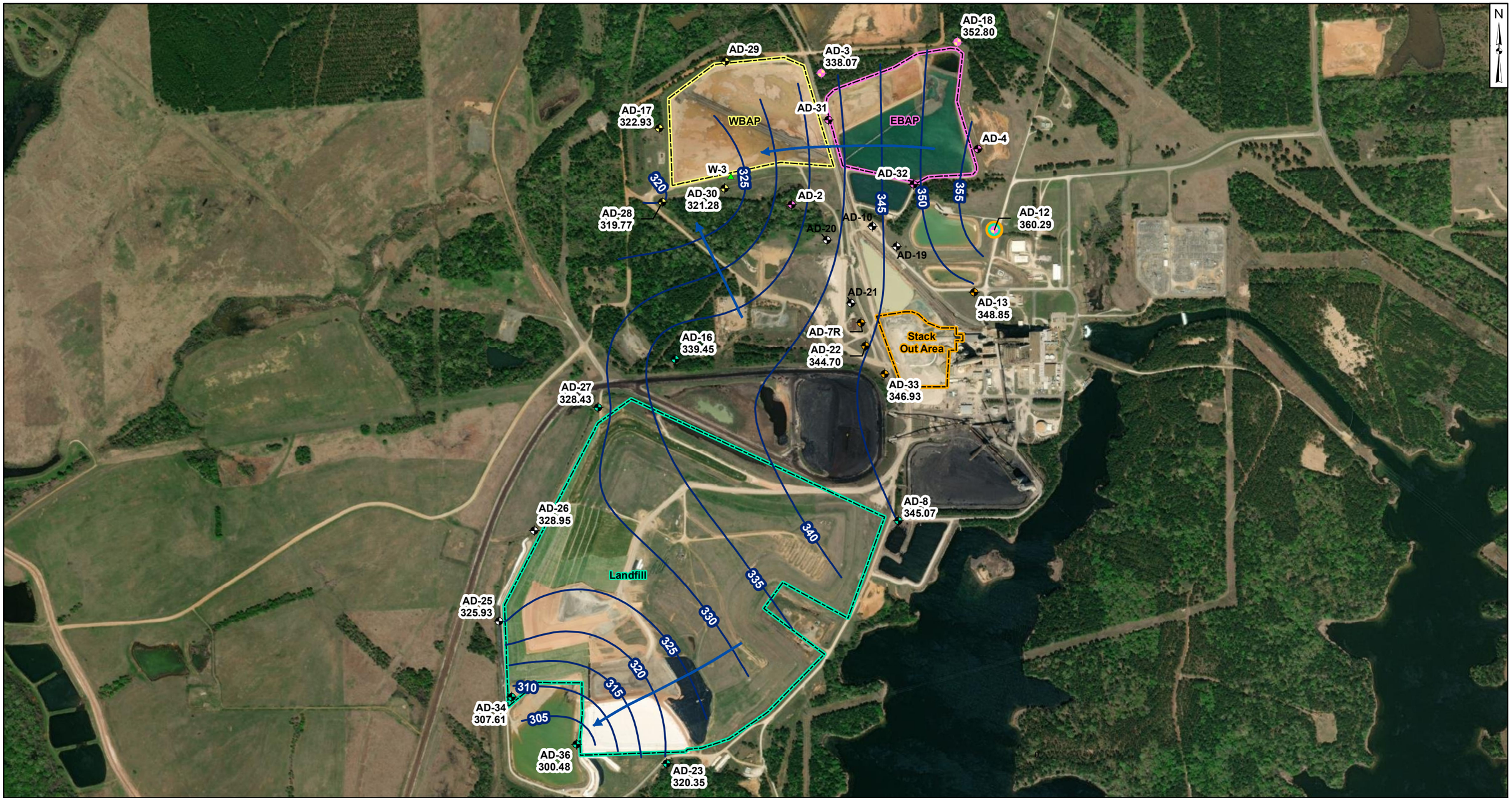
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2023/10/06

Figure **3**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\AEP-Pirkey_GW_2023-08Pirkey.mxd. ASoltero. 10/6/2023. Project/Phase/Task.



Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP

- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on October 17 and 18, 2023) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level.
4. EBAP wells were not gauged during the October 2023 event.
5. AD-02, AD-04, AD-10, AD-19, AD-20, AD-21, AD-24, AD-29, AD-31, AD-32, and W-3 were not gauged during the October 2023 event.
6. AD-7R (350.92 ft msl) was not used for contouring due to an anomalous reading.
7. AD-35 was abandoned on November 13, 2018.
8. AD-7R will be used as a substitute for AD-07, as it was abandoned.
9. Removal of CCR plus one foot of material was completed on July 26, 2022, for the West Pond.
10. Removal of CCR plus one foot of material was completed on July 20, 2023, for the East Pond.
11. Removal of CCR plus one foot of material was completed on September 18, 2023, for FGDSA.

1,000 500 0 1,000 Feet

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January 19, 2024

Geosyntec Consultants, Inc.
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Potentiometric Contours: Uppermost Aquifer October 2023

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2024/01/10

Figure 4

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APPENDIX 2- Statistical Analyses

The reports summarizing the statistical evaluation follow.

Geosyntec consultants

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Memorandum

Date:	June 5, 2023
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Pirkey Plant's Landfill

In accordance with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (30 TAC 352, "CCR rule"), the second semiannual detection monitoring event of 2022 at the Landfill, an existing CCR unit at the Pirkey Power Plant located in Hallsville, Texas, was completed on November 14, 2022. Based on the results, a two-of-two verification sampling was completed on February 28, 2023.

A data quality review was completed to assess if the data collected for this semiannual detection monitoring event met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis[1]. The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment A.

Background values (prediction limits) for the LF were previously calculated in January 2018. An alternative source demonstration (ASD) was certified on January 7, 2020 which resulted in a revision from interwell tests to intrawell tests for the pH, sulfate, and TDS prediction limits. After a minimum of four detection monitoring events, the results of those events were compared to the existing background and the dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of these revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 27, 2021.

[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Draft Technical Guidance No. 32. May 2020.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1. Noted exceedances are described in the list below.

- Boron concentrations exceeded the intrawell UPL of 0.0433 mg/L in both the initial (0.078 mg/L) and second (0.049 mg/L) samples collected at AD-23. Therefore, an SSI over background is concluded for boron at AD-23.

- Chloride concentrations exceeded the intrawell UPL of 9.54 mg/L in both the initial (11.1 mg/L) and second (11.7 mg/L) samples collected at AD-36. Therefore, an SSI over background is concluded for chloride at AD-36.

In response to the exceedances noted above, the Pirkey LF will either transition to assessment monitoring or an ASD for boron and chloride will be conducted in accordance with 30 TAC 352.931. The statistical analysis was conducted in accordance with 30 TAC 352.931 and completed within 90 days of sampling and analysis. A certification of these statistics by a qualified professional engineer is provided in Attachment B.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Pirkey Plant, Landfill

Analyte	Unit	Description	AD-23		AD-34		AD-36	
			11/14/2022	2/28/2023	11/14/2022	2/28/2023	11/14/2022	2/28/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0433		0.145		0.0702	
		Analytical Result	**0.078**	**0.049**	0.067	--	0.068	--
Calcium	mg/L	Intrawell Background Value (UPL)	0.536		42.8		0.304	
		Analytical Result	0.24	--	**44.6**	41.9	0.28	--
Chloride	mg/L	Intrawell Background Value (UPL)	8.88		9.35		9.54	
		Analytical Result	7.49	--	7.47	--	**11.1**	**11.7**
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00		1.29		0.0800	
		Analytical Result	0.06	--	0.44	--	0.07	--
pH	SU	Intrawell Background Value (UPL)	5.2		4.2		5.7	
		Intrawell Background Value (LPL)	2.8		2.9		3.5	
		Analytical Result	4.5	--	3.5	--	4.5	--
Sulfate	mg/L	Intrawell Background Value (UPL)	14.5		1,280		4.20	
		Analytical Result	8.03	--	1,250	--	2.93	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	111		1,700		98.5	
		Analytical Result	80	--	**1,720**	1,640	50	--

Notes:
Bold values exceed the background value.
Background values are shaded gray.
LPL: Lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: Upper prediction limit

ATTACHMENT A
Data Quality Review Memoranda

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Memorandum

Date:	January 20, 2023
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – H.W. Pirkey Power Plant November 2022 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the H.W. Pirkey Power Plant, located in Pittsburg, Texas in November 2022. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, "CCR Rule"). The groundwater samples were analyzed for 40 CFR 257 Appendix III and IV constituents, plus additional constituents collected to support site evaluation efforts.

The following sample data groups (SDGs) were associated with the November 2022 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223647
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223649
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223664
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223668

The laboratory reports for SDGs 223647 and 223649 were reissued in December 2022 with amended matrix spike precision calculations. The data included in the revised laboratory reports associated with these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32[1] prior to submittal of this data to TCEQ.

[1] TCEQ. 2020. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action Draft Technical Guidance No. 32. May.

The following data quality issues were identified:

- As reported in SDG 223664, chromium, cobalt, and molybdenum were detected in the equipment blank sample "Equipment Blank" collected on 11/16/2022. The detected chromium concentration in the equipment blank (0.47 µg/L) was more than 10% of the detected values in the groundwater samples, which could result in high bias for all groundwater chromium results. The detected cobalt concentration in the equipment blank (0.143 µg/L) was more than 10% of the detected value in sample "AD-18" (0.723 µg/L), which could result in high bias in the "AD-18" cobalt results. The estimated molybdenum concentration in the equipment blank (0.2 µg/L) was more than 10% of the detected value in sample "Duplicate-2" (0.2 µg/L), which could result in high bias in the "Duplicate-2" molybdenum results. Molybdenum was not detected in the other groundwater samples.

- As reported in SDG 223649, the relative percent difference (RPD) for sulfate concentrations from parent sample "AD-36" and duplicate sample "Landfill Duplicate" was 86%. The "AD-36" sulfate results should be considered estimated.

- As reported in SDG 223664, the following matrix spike (MS) and matrix spike duplicate (MSD) recovery for sodium (160% and 223%, respectively) associated with sample "AD-2" was above the acceptable range of 75-125%. The MS recovery for sodium (50.4%) associated with sample "AD-30" was below the acceptable range of 75-125%. The associated samples ("AD-2" and "AD-30") were flagged M1: the associated MS or MSD recovery was outside acceptance limits. The "AD-2" and "AD-30" sodium results should be considered estimated. Sodium is not a regulated Appendix III or IV constituent.

- As reported in SDG 223664, the RPD for radium-226 (52.5%) in the laboratory duplicate was above the acceptable limit of 25%. The "AD-12" radium-226 result was flagged P1: the precision between duplicate results was above acceptance limits. The "AD-12" radium-226 results should be considered estimated.

Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered usable for supporting project objectives.

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Memorandum

Date:	April 28, 2023
To:	David Miller (AEP)
Copies to:	Jill Parker-Witt (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Pirkey Power Plant February 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant, located in Hallsville, Texas in February and March 2023. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, "CCR Rule"). 40 CFR 257 Appendix III constituents were analyzed.

The following sample data groups (SDGs) were associated with the February and March 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 230657
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 230702

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32[1] prior to submittal of this data to TCEQ.

The following data quality issues were identified:

- As reported in SDG 230702, boron was detected in the equipment blank sample "EQUIPMENT BLANK" collected on 2/28/2023. The detected boron concentration in the

[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

equipment blank (0.009 mg/L) was more than 10% of the detected values for boron in sample AD-23 (0.049 mg/L), which could result in high bias in the AD-23 boron results.

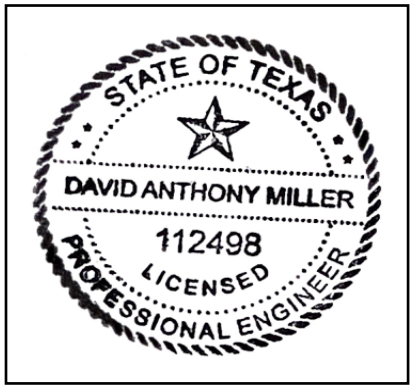
Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered usable for supporting project objectives.

ATTACHMENT B

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the January 27, 2021 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Pirkey Landfill CCR management area and that the requirements of 30 TAC 352.931(a) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	06.07.2023
License Number	Licensing State	Date

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Memorandum

Date:	November 28, 2023
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Pirkey Plant's Landfill

In accordance with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (30 TAC 352, "CCR rule"), the first semiannual detection monitoring event of 2023 at the Landfill, an existing CCR unit at the Pirkey Power Plant in Hallsville, Texas, was completed on June 27, 2023. Based on the results, a two-of-two verification sampling was completed on August 23, 2023.

A data quality review was completed to assess if the data collected for this semiannual detection monitoring event met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis[1]. The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment A.

Background values (prediction limits) for the LF were previously calculated in January 2018. An alternative source demonstration (ASD) was certified on January 7, 2020 which resulted in a revision from interwell tests to intrawell tests for the pH, sulfate, and TDS prediction limits. After a minimum of four detection monitoring events, the results of those events were compared to the existing background and the dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of these revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 27, 2021.

[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Draft Technical Guidance No. 32. May 2020.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1. Noted exceedances are described in the list below.

- Calcium concentrations were above the intrawell UPL of 0.304 mg/L in both the initial (0.88 mg/L) and second (1.22 mg/L) samples collected at AD-36. Therefore, an SSI over background is concluded for calcium at AD-36.

- Chloride concentrations were above the intrawell UPL of 9.54 mg/L in both the initial (11.1 mg/L) and second (11.8 mg/L) samples collected at AD-36. Therefore, an SSI over background is concluded for calcium at AD-36.

In response to the exceedances noted above, the Pirkey LF will either transition to assessment monitoring or an ASD for calcium and chloride at AD-36 will be conducted in accordance with 30 TAC 352.931. The statistical analysis was conducted in accordance with 30 TAC 352.931 and completed within 90 days of sampling and analysis. A certification of these statistics by a qualified professional engineer is provided in Attachment B.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Pirkey - Landfill

Analyte	Unit	Description	AD-23		AD-34		AD-36	
			6/27/2023	8/23/2023	6/27/2023	8/23/2023	6/27/2023	8/23/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0433		0.145		0.0702	
		Analytical Result	**0.061**	0.026	0.057	--	0.067	--
Calcium	mg/L	Intrawell Background Value (UPL)	0.536		42.8		0.304	
		Analytical Result	0.44	--	40.1	--	**0.88**	**1.22**
Chloride	mg/L	Intrawell Background Value (UPL)	8.88		9.35		9.54	
		Analytical Result	7.55	--	7.18	--	**11.1**	**11.8**
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00		1.29		0.0800	
		Analytical Result	0.04	--	0.63	--	0.06	--
pH	SU	Intrawell Background Value (UPL)	5.2		4.2		5.7	
		Intrawell Background Value (LPL)	2.8		2.9		3.5	
		Analytical Result	4.5	--	3.7	--	4.0	--
Sulfate	mg/L	Intrawell Background Value (UPL)	14.5		1,280		4.20	
		Analytical Result	7.7	--	1,230	--	3.6	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	111		1,700		98.5	
		Analytical Result	70	--	**1,710**	1,560	60	--

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A
Data Quality Review Memoranda

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Memorandum

Date:	September 19, 2023
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Pirkey Power Plant June 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant in Hallsville, Texas in June 2023. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, "CCR Rule"). 40 CFR 257 Appendix III constituents were analyzed.

The following sample data groups (SDGs) were associated with the June 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 231962
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 231989

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32[1] prior to submittal of this data to TCEQ.

No data quality issues were identified. Based on these findings, the data reported in these SDGs are considered accurate and complete and the data are considered usable for supporting project objectives.

[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

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Memorandum

Date:	October 27, 2023
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Pirkey Power Plant August 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant, located in Hallsville, Texas in August 2023. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality's (TCEQ's) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, "CCR Rule"). 40 CFR 257 Appendix III constituents were analyzed.

The following sample data groups (SDGs) were associated with the August 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 232658

The data included in this SDG was reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32[1] prior to submittal of this data to TCEQ.

No data quality issues were identified. Based on these findings, the data reported in this SDG are considered accurate and complete and the data are considered usable for supporting project objectives.

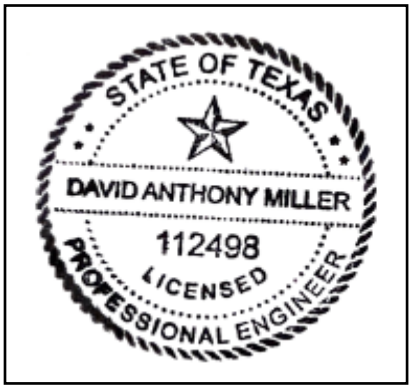
[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

ATTACHMENT B

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the January 27, 2021 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Pirkey Landfill CCR management area and that the requirements of 30 TAC 352.931(a) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	12.19.2023
License Number	Licensing State	Date

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, BACKGROUND UPDATE CALCULATIONS

LANDFILL

H.W. Pirkey Power Plant

Hallsville, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 West Wilson Bridge Road, Suite 250
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Project Number: CHA8500B

January 25, 2024

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ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
CCR	coal combustion residuals
LPL	lower prediction limit
QA/QC	quality assurance and quality control
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

Groundwater monitoring has been conducted at the Landfill, an existing coal combustions residuals (CCR) unit at the H.W. Pirkey Power Plant in Hallsville, Texas, in accordance with Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of CCR in landfills and surface impoundments (Texas Administrative Code, Title 30, Chapter 352). It is required under the CCR rule to establish background concentrations for Appendix III parameters in groundwater. These background concentrations are used to calculate prediction limits for future detection monitoring events.

Background concentration values for Appendix III parameters were last calculated for the Landfill in January 2021. Since then, six semiannual detection monitoring events were conducted. This report details how data from these recent groundwater monitoring results were analyzed and incorporated into the LF background dataset and provides updated prediction limits.

1.1 Previous Monitoring Events and Background Calculations

Before May 2017, eight monitoring events were completed to establish background concentrations and calculate prediction limits for Appendix III and Appendix IV parameters under the CCR rule. The data were reviewed for outliers and trends before upper prediction limits (UPLs) were calculated for each Appendix III parameter and lower prediction limits (LPLs) were established for pH. Intrawell prediction limits were selected for boron, calcium, chloride, and fluoride, with a one-of-two resampling plan. Interwell prediction limits were selected for pH, sulfate, and total dissolved solids (TDS) with a one-of-two resampling plan; however, the interwell prediction limits were revised to intrawell tests following collection of additional data which determined that former mining activities in the vicinity of the Landfill were affecting groundwater quality at downgradient well AD-34 (Geosyntec 2020). The statistical analyses completed to establish background levels are detailed in the January 2018 *Statistical Analysis Summary* report (Geosyntec 2018).

Calculated background values should be updated every four to eight measurements, as recommended in the United States Environmental Protection Agency (USEPA) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance* (USEPA 2009). These updated background concentration values are used to revise the site-specific prediction limits. The prediction limits have previously been updated twice.

In January 2021, prediction limits for Appendix III parameters were updated with data collected up to July 2020 (Geosyntec 2021a). Intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis and these prediction limits were used for detection monitoring events completed between November 2020 and August 2023. Intrawell prediction limits were also calculated for downgradient well AD-36, which replaced AD-35 in October 2018 after AD-35 was decommissioned in November 2018 due to Landfill expansion activities (Arcadis, 2018; Geosyntec 2021a).

2. STATISTICAL ANALYSIS AND BACKGROUND DATA UPDATE

Six semiannual detection monitoring events were conducted since the last background update (Table 1). Verification sampling was completed (on an individual well or parameter basis) if the initial results for each detection monitoring event identified possible exceedances. Therefore, a minimum of six samples have been collected from each compliance well since the previous background update.

Data from the six semiannual detection monitoring events conducted at the Landfill between November 2020 and August 2023, including both initial and verification results, have been evaluated for inclusion in the background dataset. The detection monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The data were reviewed for outliers, with one value removed from the dataset before the UPLs for each Appendix III parameter and the LPL for pH were updated to represent background values. The selected statistical methods have been certified by a qualified professional engineer (Attachment A).

2.1 Data Validation and QA/QC

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification 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.10.0.15 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues that would impact data usability were noted.

2.2 Statistical Analysis

Statistical analyses for the Landfill were conducted in accordance with the *Statistical Analysis Plan* (Geosyntec 2021b). These statistical analyses incorporated data from the six semiannual detection monitoring events and associated verification sampling events conducted between November 2020 and August 2023 (Table 1). The complete statistical analysis results are included in Attachment B.

Time series plots of Appendix III parameters (Appendix B) were used to evaluate concentrations over time and to provide an initial screening of suspected outliers and trends. Box plots were also compiled to provide visual representation of variations between wells and within individual wells (Attachment B).

2.2.1 Outlier Evaluation

Potential outliers were evaluated using Tukey's outlier test. That is, data points were considered potential outliers if they met one of the following criteria:

$$x_i < \tilde{x}_{0.25} - 3 \times IQR \quad (1)$$

or

$$x_i > \tilde{x}_{0.75} + 3 \times IQR \quad (2)$$

where:

$x_i =$ individual data point
$\tilde{x}_{0.25} =$ first quartile
$\tilde{x}_{0.75} =$ third quartile
$IQR =$ the interquartile range $= \tilde{x}_{0.75} - \tilde{x}_{0.25}$

Data that were evaluated as potential outliers are summarized in Attachment B. One outlier was identified in the data collected for the six most recent detection monitoring events: a high boron value of 0.206 milligrams per liter (mg/L) at background well AD-16 on November 17, 2021. This outlier was removed from the dataset to generate a prediction limit which is more conservative from a regulatory perspective.

2.2.2 Establishment of Updated Background Dataset

Analysis of variance (ANOVA) was conducted during the initial background screening to assist in evaluating whether intrawell testing is the most appropriate statistical approach for assessing Appendix III parameters. Intrawell tests, which compare compliance data from a single well to background data within the same well, are most appropriate 1) when upgradient wells exhibit spatial variation; 2) when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; or 3) when downgradient water quality is not impacted compared to upgradient water quality for the same parameter. It is necessary to update background statistical limits (calculated prediction limits) periodically because natural systems change continuously with physical changes to the environment. For intrawell analyses, data for all wells and constituents are reevaluated when a minimum of four new data points are available. These four (or more) new data points are used to determine whether earlier concentrations are representative of present-day groundwater quality.

Mann-Whitney (Wilcoxon rank-sum) tests were used to compare the medians of historical data (May 2016–July 2020) to the new compliance samples (November 2020 - August 2023). Results (Appendix B) were evaluated to determine whether the medians of the two groups were similar at the 99% confidence level. Where no significant difference was found, the new compliance data were added to the background dataset. Where a statistically significant difference was found, the data were reviewed to evaluate the cause of the difference and to assess which was most appropriate: adding newer data to the background dataset, replacing the background dataset with the newer data, or continuing to use the existing background dataset. If the differences appeared to have been caused by a release, then the previous background dataset would continue to be used.

Significant differences were found between the two groups for the following upgradient well/parameter pairs:

- A decrease was found for fluoride at AD-12
- A decrease was found for sulfate at AD-16.

The background datasets for fluoride at AD-12 was updated because the magnitudes of the differences were minimal, and these data represent naturally occurring groundwater quality not impacted by a release. A steady decrease since 2019 was noted for sulfate concentrations at AD-16; therefore, this dataset was truncated to use the most recent eight sampling events to construct a statistical limit that is more representative of current conditions. Additionally, while a statistically significant difference was not identified at the 99% confidence level for chloride at upgradient well AD-16, a steady increase in concentrations was noted since 2016. The background dataset for chloride at AD-16 was not updated using the more recent sampling results to maintain a more conservative prediction limit.

Statistically significant differences were found between the two groups for the following downgradient well/parameter pairs:

- An increase was found for boron at AD-23.
- A decrease was found for boron at AD-34.
- Increases were found for calcium, sulfate, and TDS at AD-34.

For the downgradient well/parameter pairs with statistically significant increases or decreases listed above, the magnitude of the difference was small or similar to those observed in upgradient wells; therefore, the background dataset was updated to include the compliance dataset.

After the revised background set was established, a parametric or nonparametric analysis was selected based on the distribution of the data and the frequency of nondetect data. Estimated results less than the practical quantitation limit (PQL)—that is, "J-flagged" data—were considered detections, and the estimated results were used in the statistical analyses. Nonparametric analyses were selected for datasets with at least 50% nondetect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk/Shapiro-Francía test for normality. The Kaplan-Meier nondetect adjustment was applied to datasets with between 15% and 50% nondetect data. For datasets with fewer than 15% nondetect data, nondetect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or nonparametric) and transformation (where applicable) for each background dataset are shown in Attachment B.

2.2.3 Updated Prediction Limits

Except as noted above, all historical data through August 2023 were used to update the intrawell UPLs (and intrawell LPLs, for pH) and to represent background values (Table 2).

The intrawell UPLs and LPLs were calculated for a one-of-two retesting procedure; that is, if at least one sample in a series of two has no measurement greater than the UPL and if the pH result is greater than or equal to the LPL, then it can be concluded that a statistically significant increase has not occurred. In practice, where the initial result is not greater than the UPL and where the pH result is greater than or equal to the LPL, a second sample will not be collected. The retesting procedures allow an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated with intrawell prediction limits.

2.3 Conclusions

Six detection monitoring events were completed between November 2020 and August 2023 in accordance with the CCR rule. The laboratory and field data from these events were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. Mann-Whitney tests were completed to evaluate whether data from the detection monitoring events could be added to the existing background dataset. Where appropriate, the background datasets were updated, and UPLs and LPLs were recalculated. Intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis, and prediction limits were updated for all Appendix III parameters.

3. REFERENCES

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Geosyntec. 2018. *Statistical Analysis Summary. Landfill – J. Robert Welsh Plant*. Geosyntec Consultants, Inc. February.

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TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary - Background Update Calculations
Pirkey Plant - Landfill

Parameter	Unit	AD-8						AD-12								
		11/3/2020	5/26/2021	11/17/2021	6/22/2022	11/14/2022	6/27/2023	11/2/2020	3/8/2021	5/24/2021	11/15/2021	3/28/2022	6/20/2022	11/15/2022	2/27/2023	6/26/2023
		2020-D2	2021-D1	2021-D2	2022-D1	2022-D2	2023-D1	2020-D2	2020-D2-R1	2021-D1	2021-D2	2021-D2-R1	2022-D1	2022-D2	2022-D2-R1	2023-D1
Boron	mg/L	0.822	0.986	0.693	1.04	1.03	0.994	0.03 J1	0.01 J1	0.032 J1	0.012 J1	0.021 J1	0.042 J1	0.013 J1	0.021 J1	0.019 J1
Calcium	mg/L	18.5	93.4	21.9 M1, P3	37.2 M1	17.9	92.7	0.3 J1	0.2 J1	0.2 J1	0.28	0.20	0.32	0.36	0.34	0.21
Chloride	mg/L	15.8	3.28	15.4	17.0	23.1	6.97	4.65	6.46	5.54	8.03	6.10	7.59	8.03	6.51	4.68
Fluoride	mg/L	2.50	0.35	2.31	2.85	2.04	0.31	0.08	0.11	0.12	0.07	0.07	0.09	0.08	0.07	0.06
Sulfate	mg/L	119	168	97.2	117	119	182	3.3	3.8	5.46	2.90	3.80	4.81	3.39	3.90	2.9
Total Dissolved Solids	mg/L	237	390	220	270	240	410	74	68	70	90	60 L1	80	70	70	80
pH	SU	4.1	5.9	4.2	5.0	4.5	5.8	4.3	4.1	4.2	3.5	3.9	4.3	4.7	3.8	4.6

Parameter	Unit	AD-16						AD-23									
		11/3/2020	5/26/2021	11/17/2021	6/22/2022	11/14/2022	6/27/2023	11/4/2020	5/26/2021	11/17/2021	1/26/2022	6/22/2022	8/30/2022	11/14/2022	2/28/2023	6/27/2023	8/23/2023
		2020-D2	2021-D1	2021-D2	2022-D1	2022-D2	2023-D1	2020-D2	2021-D1	2021-D2	2021-D2-R1	2022-D1	2022-D1-R1	2022-D2	2022-D2-R1	2023-D1	2023-D1-R1
Boron	mg/L	0.05 U1	0.016 J1	0.206	0.021 J1	0.024 J1	0.016 J1	0.05 U1	0.023 J1	0.045 J1	0.040 J1	0.057	0.032 J1	0.078	0.049 J1	0.061	0.026 J1
Calcium	mg/L	0.817	0.8	0.94	1.80	0.91	0.79	0.2 J1	0.3	0.22	--	0.25	--	0.24	--	0.44	--
Chloride	mg/L	19.9	23.2	22.3	24.7	25.2	28.9	6.97	6.94	7.11	--	7.32	--	7.49	--	7.55	--
Fluoride	mg/L	0.07	0.13	0.07	0.10	0.07	0.08	0.05 J1	0.06	0.05 J1	--	0.07	--	0.06	--	0.04 J1	--
Sulfate	mg/L	11.0	7.36	9.64	9.58	6.68	7.3	7.9	7.90	7.84	--	9.52	--	8.03	--	7.7	--
Total Dissolved Solids	mg/L	105	120	110	110	90	120	71	70	70	--	80	--	80	--	70	--
pH	SU	4.4	4.4	4.3	4.5	4.3	4.4	3.9	3.6	3.9	4.1	3.6	3.9	4.5	4.4	4.5	4.4

Parameter	Unit	AD-27						AD-34									
		11/3/2020	5/26/2021	11/17/2021	6/22/2022	11/14/2022	6/27/2023	11/4/2020	5/26/2021	7/27/2021	11/17/2021	1/26/2022	6/22/2022	8/30/2022	11/14/2022	2/28/2023	6/27/2023	8/23/2023
		2020-D2	2021-D1	2021-D2	2022-D1	2022-D2	2023-D1	2020-D2	2021-D1	2021-D1-R1	2021-D2	2021-D2-R1	2022-D1	2022-D1-R1	2022-D2	2022-D2-R1	2023-D1	2023-D1-R1
Boron	mg/L	0.03 J1	0.029 J1	0.040 J1	0.028 J1	0.034 J1	0.032 J1	0.060	0.063	--	0.069	--	0.066	--	0.067	--	0.057	--
Calcium	mg/L	3.45	3.6	3.76	3.88	3.79	3.86	39.5	39.7	--	45.8	42.6	45.8	46.0	44.6	41.9	40.1	--
Chloride	mg/L	10.8	13.5	11.6	12.5	12.7	13.6	7.10	7.44	--	7.09	--	7.38	--	7.47	--	7.18	--
Fluoride	mg/L	0.19	0.25	0.20	0.22	0.20	0.14	0.82	2.1	0.82	1.11	--	1.20	--	0.44	--	0.63	--
Sulfate	mg/L	53.1	50.8	56.4	57.2	59.4	59.9	1,090	1,110	--	1,280	--	1,260	--	1,250	--	1,230	--
Total Dissolved Solids	mg/L	196	230	190 P1	210	180	210	1,670	1,670	--	1,850	1,720 S7	1,750	1,650	1,720	1,640	1,710	1,560
pH	SU	3.6	3.5	3.7	3.3	4.0	4.2	3.4	2.9	3.2	3.1	3.4	3.7	4.0	3.5	3.8	3.7	3.8

Parameter	Unit	AD-36									
		11/4/2020	5/26/2021	7/27/2021	11/17/2021	6/22/2022	8/30/2022	11/14/2022	2/28/2023	6/27/2023	8/23/2023
		2020-D2	2021-D1	2021-D1-R1	2021-D2	2022-D1	2022-D1-R1	2022-D2	2022-D2-R1	2023-D1	2023-D1-R1
Boron	mg/L	0.068	0.057	--	0.070	0.059	--	0.068	--	0.067	--
Calcium	mg/L	0.2 J1	0.6	0.3	0.25	0.38	0.28	0.28	--	0.88	1.22
Chloride	mg/L	7.99	10.6	8.67	8.97	10.1	10.3	11.1	11.7	11.1	11.8
Fluoride	mg/L	0.06 J1	0.10	0.07	0.05 J1	0.09	0.07	0.07	--	0.06	--
Sulfate	mg/L	3.1	4.08	--	2.89	5.00	3.00	2.93	--	3.6	--
Total Dissolved Solids	mg/L	57	60	--	50 P1	60	--	50	--	60 P1	--
pH	SU	4.6	4.0	3.9	4.0	4.6	4.9	4.5	4.5	4.0	4.2

Notes:
--: Not Measured
D1: First semiannual detection monitoring event of the year
D2: Second semiannual detection monitoring event of the year
J1: Estimated value. Parameter was detected in concentrations below the reporting limit. In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.
L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
P1: The precision between duplicate results was above acceptance limits.
P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.
R1: First verification event associated with detection monitoring round
SU: standard unit
S7: Sample did not achieve constant weight.
U1: Parameter was not present in concentrations above the method detection limit and is reported as the reporting limit. In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

Table 2. Background Level Summary
Statistical Analysis Summary – Background Update Calculations
H.W. Pirkey Plant – Landfill

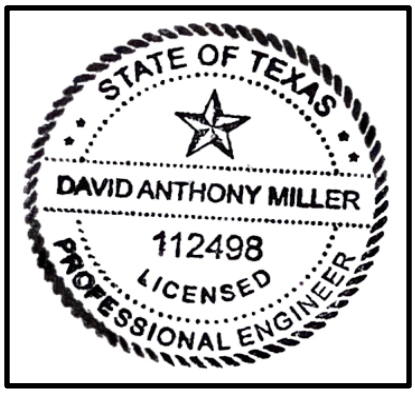
Parameter	Unit	Description	AD-23	AD-34	AD-36
Boron	mg/L	Intrawell Background Value (UPL)	0.0612	0.108	0.0747
Calcium	mg/L	Intrawell Background Value (UPL)	0.503	46.1	1.22
Chloride	mg/L	Intrawell Background Value (UPL)	8.92	8.97	11.8
Fluoride	mg/L	Intrawell Background Value (UPL)	0.156	1.58	0.0980
pH	SU	Intrawell Background Value (UPL)	5.0	4.1	5.2
		Intrawell Background Value (LPL)	3.1	2.9	3.7
Sulfate	mg/L	Intrawell Background Value (UPL)	13.6	1,340	4.77
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	104	1,840	84.9

Notes:
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Pirkey Landfill CCR management area and that the requirements of § 352.931(a) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	01.25.2024
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

December 29, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085

Re: Pirkey Landfill
Background Update – 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the 2023 background update of groundwater data at American Electric Power Company's Pirkey Landfill. This site is in Detection Monitoring and the analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, is listed below. Note that downgradient well AD-35 was originally in the well network but has been abandoned and replaced with well AD-36.

- **Upgradient wells:** AD-8, AD-12, AD-16, and AD-27
- **Downgradient wells:** AD-23, AD-34, and AD-36

Data were sent electronically, and 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. The background update performed during this analysis was reviewed by Kristina Rayner, Founder and Senior Statistician for Groundwater Stats Consulting

The CCR program consists of the following Appendix III constituents:

- boron, calcium, chloride, fluoride, pH, sulfate, and TDS

Time series plots for these parameters at all wells are provided for the purpose of screening data at these wells (Figure A). Additionally, a separate section of box plots is included for all constituents at upgradient and downgradient wells (Figure 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. When values in background have been flagged as outliers, they may be seen in a lighter font and as a disconnected symbol on the graphs.

Due to varying detection limits in background data sets, a substitution of the most recent reporting limit is used for all non-detects. Note that for calculation of intrawell prediction limits, substitution of the most recent reporting limit is performed separately for each well/parameter pair. In some cases, the reporting limit provided by the laboratory contains varying limits for a given parameter; therefore, the substitution may differ from well to well. This generally gives the most conservative limit in each case. Reporting limit changes may occur depending on laboratory capabilities and in the case of fluoride, elevated reporting limits were replaced by the most recent reporting limit of 0.15 mg/L and was substituted across all non-detects for all wells.

In earlier analyses, data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves are provided to demonstrate that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance. The EPA suggests the selected statistical method should provide at least 55% power at 3 standard deviations or at least 80% power at 4 standard deviations.

Summary of Statistical Methods:

- Intrawell prediction limits, combined with a 1-of-2 resample plan for boron, calcium, chloride, fluoride, pH, sulfate, and TDS

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. While the false positive rate associated with the parametric limits is based on an annual 10% (5% per semi-annual

event) as recommended by the EPA Unified Guidance (2009), the false positive rate associated with the nonparametric limits is dependent upon the available background sample size, number of future comparisons, and verification resample plan. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits.

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric prediction limits are used on data containing greater than 50% non-detects.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In some cases, the earlier portion of data is deselected prior to construction of limits to provide sensitive limits that will rapidly detect changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Appendix III Background Update Summary – 2023

Outlier Analysis

Prior to updating background data, observations were evaluated using Tukey's outlier test and visual screening through the June 2023 (and in some cases, August 2023) sample events. Tukey's outlier test only noted outliers for boron in upgradient wells AD-16 and AD-27, fluoride in upgradient well AD-27, and sulfate in upgradient well AD-27 among the Appendix III parameters. Among the identified values, the highest values for boron at wells AD-16 and AD-27 and fluoride at AD-27 were flagged as outliers to construct

statistical limits that are conservative from regulatory perspective. Any values identified by Tukey's test but not flagged, such as the value for sulfate at AD-27, appeared to be similar to other concentrations within their respective wells. Although not identified by Tukey's test, the highest value for boron at downgradient well AD-34 was flagged in order to reduce variation and construct statistical limits that are representative of present-day groundwater quality conditions. A summary of Tukey's test results and a list of flagged values follows this letter (Figure C).

Mann-Whitney Evaluation

For all Appendix III parameters, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through July 2020 to the new compliance samples at each well through June/August 2023 (Figure D). The test evaluates whether the groups are statistically different at the 99% confidence level. If no significant difference is found, background data may be updated with compliance data. Well/constituent pairs with truncated records from the previous update maintained the truncated portion for the Mann-Whitney test. Statistically significant differences (either an increase or decrease in median concentrations) were found between the two groups for the following well/constituent pairs:

Increase:

- Boron: AD-23
- Calcium: AD-34
- Sulfate: AD-34
- TDS: AD-34

Decrease

- Boron: AD-34
- Fluoride: AD-12 (upgradient)
- Sulfate: AD-16 (upgradient)

Typically, when the test concludes that the medians of the two groups are statistically significantly different, particularly in the downgradient wells, the background data are not updated to include the newer data unless it can be reasonably justified that the change in concentrations reflects a shift unrelated to practices at the site. In studies such as the current one, in which at least one of the segments being compared is of short duration, the comparison is complicated by the fact that normal short-term variation may be mistaken for long-term change in medians.

Although statistically significant differences in medians were identified at the 99% confidence level, the following well/constituent pairs had compliance concentrations

similar to existing historical measurements and would result in minimal changes to existing statistical limits; therefore, the respective records were updated: boron, calcium, sulfate, and TDS at downgradient well AD-34, and fluoride at upgradient well AD-12.

For boron at downgradient well AD-23, although a statistically significant increase in concentrations was identified, the increase in median concentrations is small relative to overall concentrations and all observations are at least an order of magnitude smaller than concentrations found at multiple upgradient wells; therefore, the record for this well/constituent pair was updated.

While a statistically significant difference was not identified at the 99% confidence level for chloride at upgradient well AD-16, this well/constituent pair has exhibited a constant increase in concentrations since it was first sampled in 2016. Therefore, to maintain conservative limits, the record for this well/constituent pair was not updated at this time.

Regarding sulfate at upgradient well AD-16, since the concentrations have steadily decreased since 2019, the earlier portions of the records were deselected prior to construction of statistical limits so that the limits are more representative of present-day water quality conditions. This record will utilize the most recent 8 measurements beginning from 8/15/2019.

As mentioned during the previous update, calcium at upgradient well AD-16 and chloride at upgradient well AD-27 used a truncated portion of the record the earlier portions of the records were deselected prior to construction of statistical limits so that limits are more representative of present-day water quality conditions. The records for these well/constituent pairs will utilize measurements beginning from 4/10/2017 onward.

A full list of well/constituent pairs with truncated records follows this letter in the Date Range Table. Table entries with "overall" date ranges indicate background data sets not updated with data through June/August 2023. Background data sets for all other well/constituent pairs were updated with data through June/August 2023 for construction of intrawell prediction limits. A summary of the Mann-Whitney results follows this letter, and the test results are included with the Mann Whitney test section at the end of this report. All records will be re-evaluated for updating statistical limits when a minimum of 4 samples are available.

Prediction Limits

Intrawell prediction limits using all historical data through June/August 2023, except for the cases mentioned above, combined with a 1-of-2 resample plan, were constructed, and a summary of the updated limits follows this letter (Figure E).

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

For Groundwater Stats Consulting,

Andrew Collins
Project Manager

Kristina Rayner
Senior Statistician

Date Ranges

Date: 12/28/2023 8:50 AM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

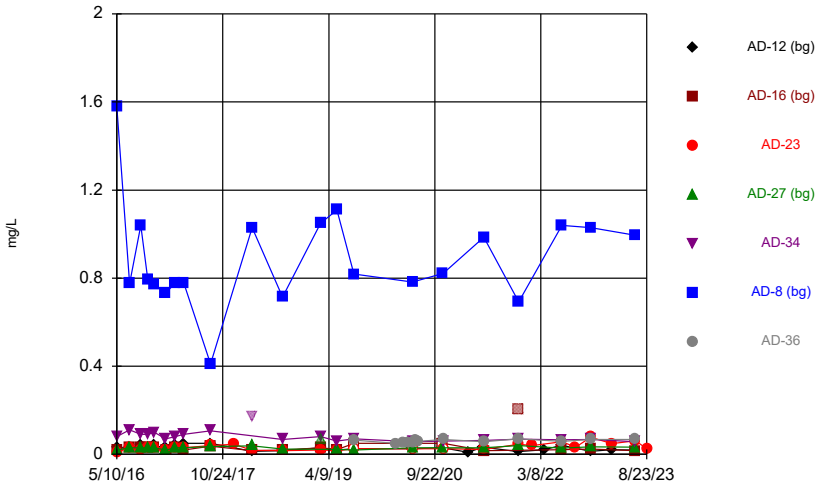
Calcium, total (mg/L)
- AD-16 background:4/10/2017-6/27/2023

Chloride, total (mg/L)
- AD-16 background:4/10/2017-6/3/2020, overall:4/10/2017-6/3/2020
- AD-27 background:4/10/2017-6/27/2023

Sulfate, total (mg/L)
- AD-16 background:8/15/2019-6/27/2023

Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

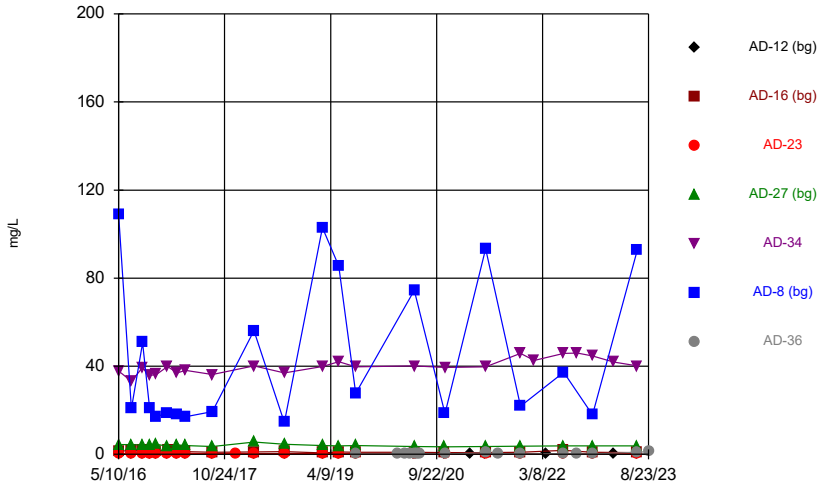
Time Series



Constituent: Boron, total Analysis Run 12/15/2023 3:48 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

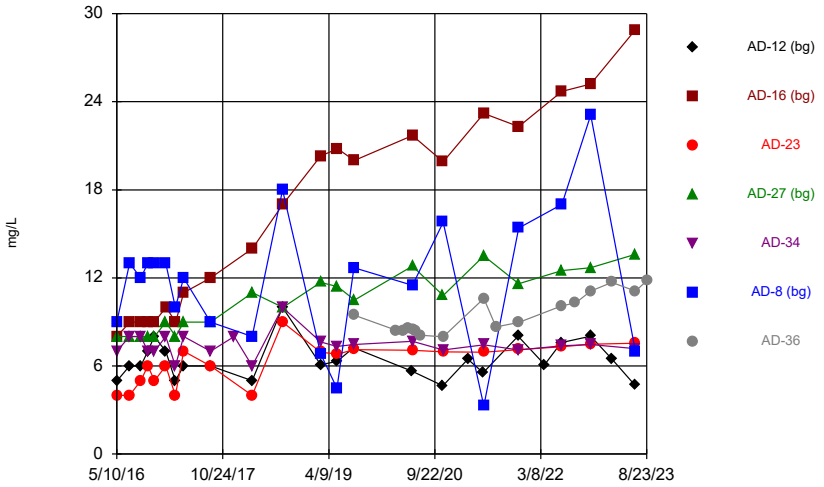
Time Series



Constituent: Calcium, total Analysis Run 12/15/2023 3:48 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

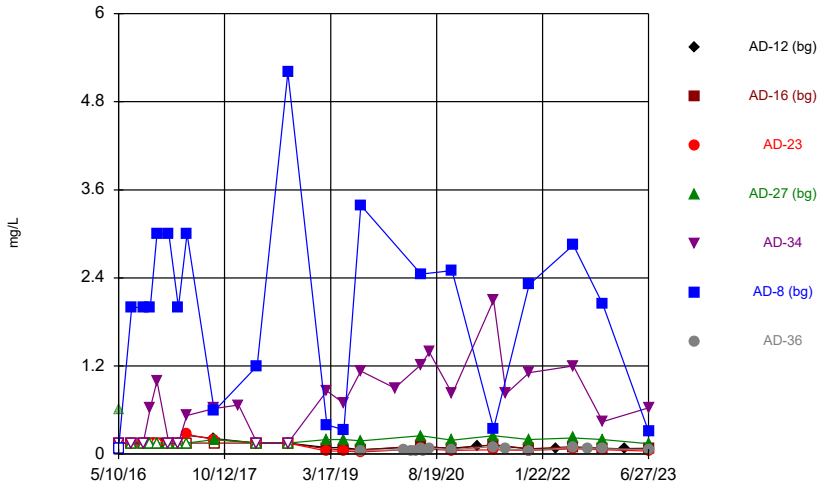
Time Series



Constituent: Chloride, total Analysis Run 12/15/2023 3:48 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

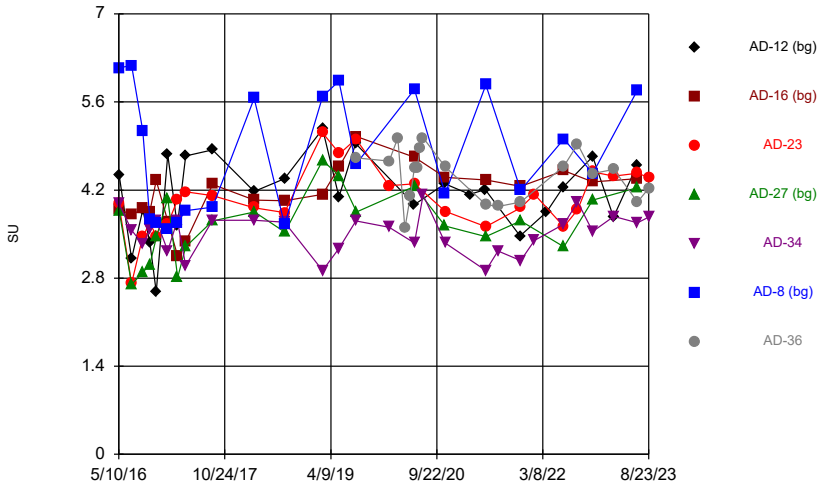
Time Series



Constituent: Fluoride, total Analysis Run 12/15/2023 3:48 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Time Series

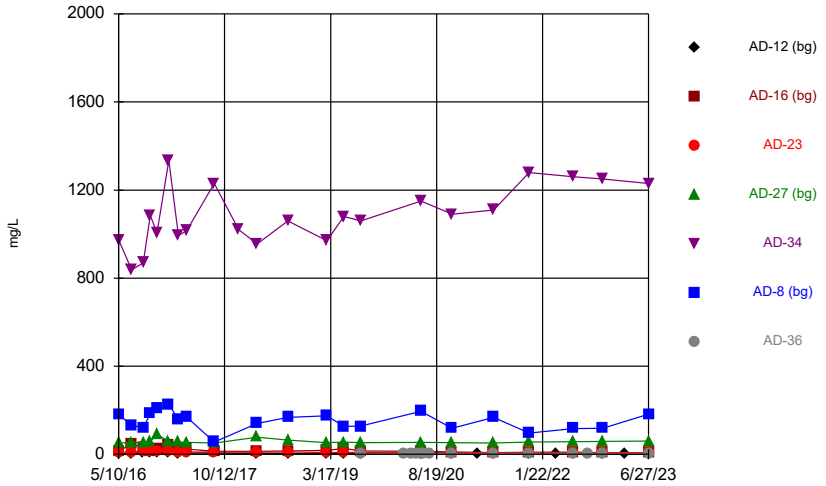


Constituent: pH, field Analysis Run 12/15/2023 3:48 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Time Series



Constituent: Sulfate, total Analysis Run 12/15/2023 3:48 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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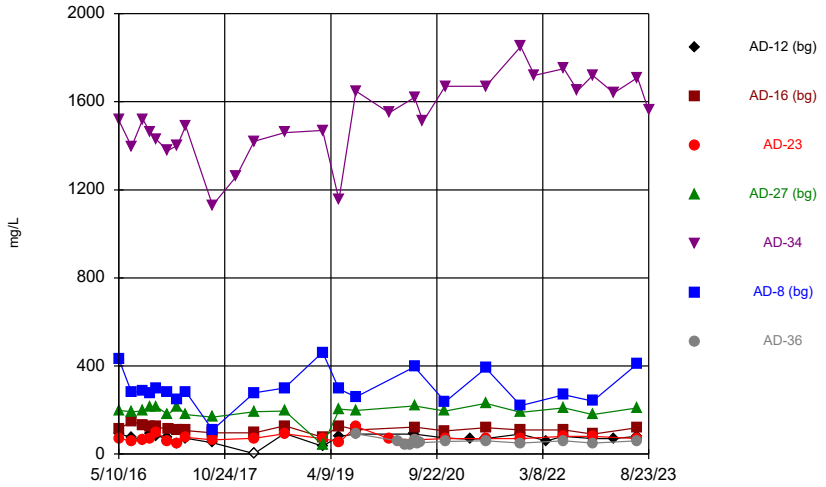
Hollow symbols indicate censored values.

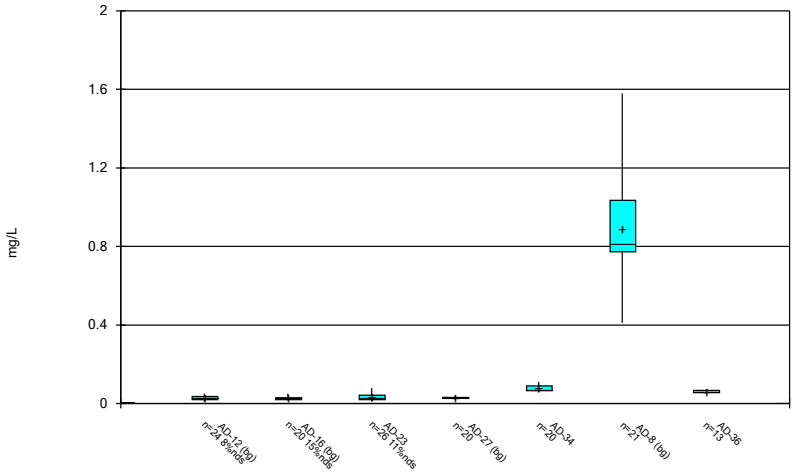
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:48 PM

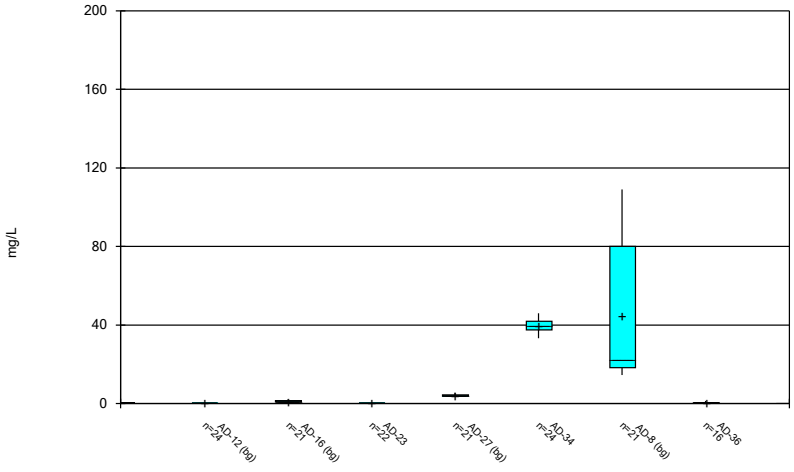
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Box & Whiskers Plot



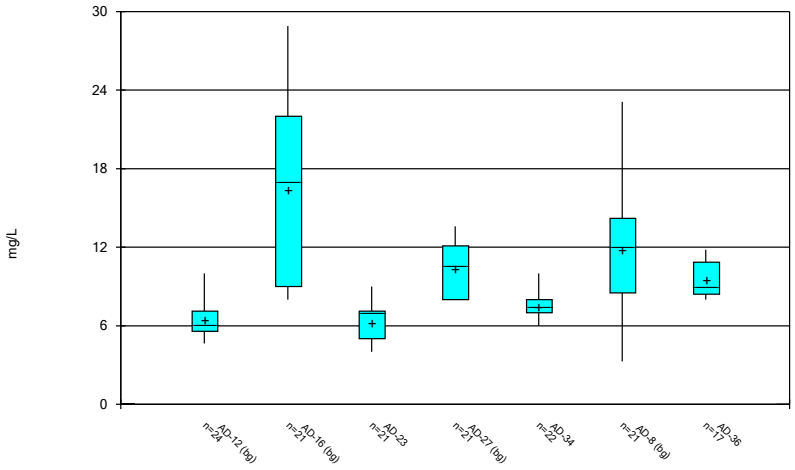
Constituent: Boron, total Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Box & Whiskers Plot



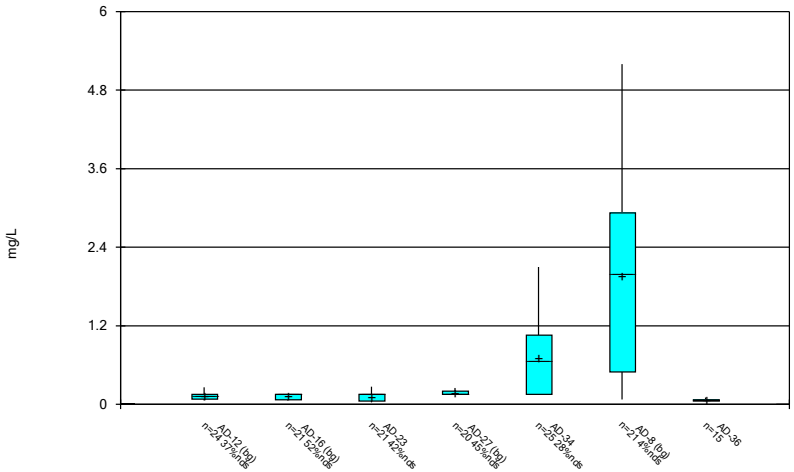
Constituent: Calcium, total Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Box & Whiskers Plot



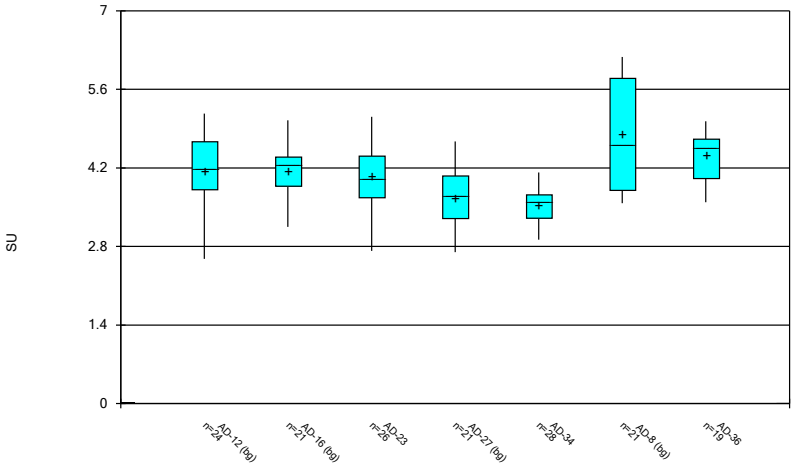
Constituent: Chloride, total Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Box & Whiskers Plot



Constituent: pH, field Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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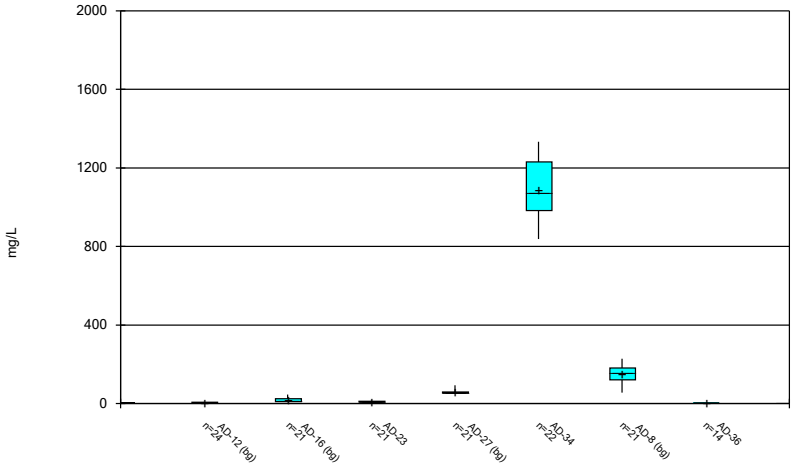
Box & Whiskers Plot



Constituent: Sulfate, total Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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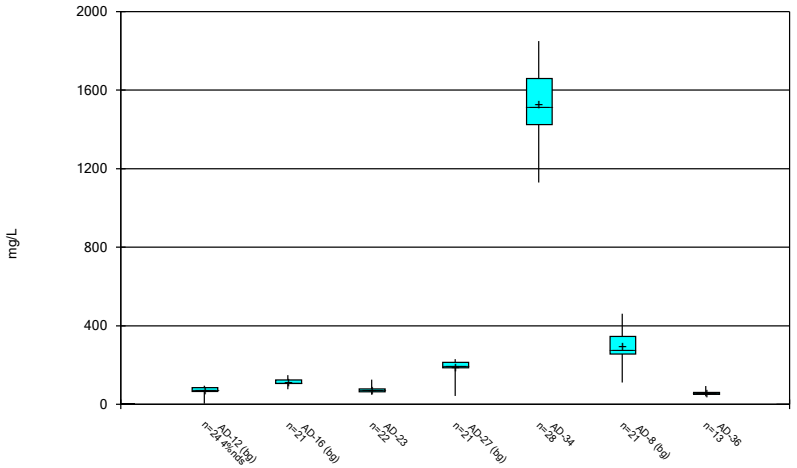
Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:49 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Outlier Summary

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill Printed 12/15/2023, 3:50 PM

	AD-16 Boron, total (mg/L)	AD-27 Boron, total (mg/L)	AD-34 Boron, total (mg/L)	AD-27 Fluoride, total (mg/L)
5/11/2016				0.6176 (J,o)
3/21/2018			0.171 (o)	
2/28/2019		0.07 (J,o)		
11/17/2021	0.206 (o)			

Tukey's Outlier Test - Significant Results

Pirkey Landfill Data: Pirkey Landfill Printed 12/15/2023, 8:56 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron, total (mg/L)	**AD-16 (bg)**	**Yes**	**0.206**	**11/17/2021**	**NP**	**NaN**	**21**	**0.03303**	**0.04003**	**ln(x)**	**ShapiroWilk**
Boron, total (mg/L)	**AD-27 (bg)**	**Yes**	**0.07**	**2/28/2019**	**NP**	**NaN**	**21**	**0.03118**	**0.01048**	**ln(x)**	**ShapiroWilk**
Fluoride, total (mg/L)	**AD-27 (bg)**	**Yes**	**0.6176**	**5/11/2016**	**NP**	**NaN**	**21**	**0.1997**	**0.1016**	**ln(x)**	**ShapiroWilk**
Sulfate, total (mg/L)	**AD-27 (bg)**	**Yes**	**92**	**11/15/2016**	**NP**	**NaN**	**21**	**58.22**	**9.785**	**ln(x)**	**ShapiroWilk**

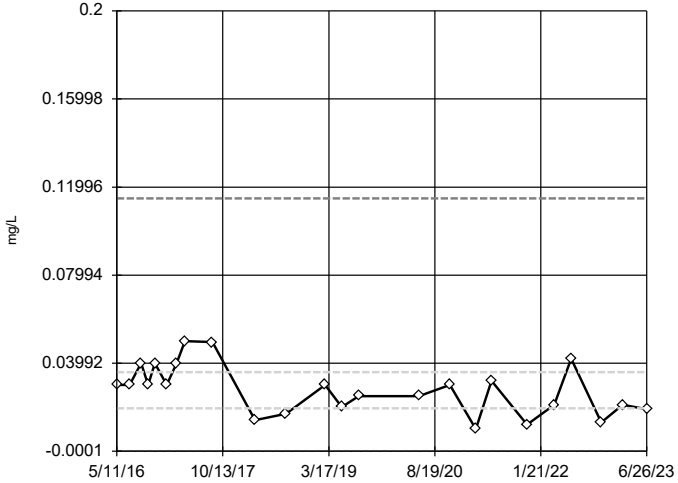
Tukey's Outlier Test - All Results

Pirkey Landfill Data: Pirkey Landfill Printed 12/15/2023, 8:56 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	0.02794	0.01142	sqrt(x)	ShapiroWilk
Boron, total (mg/L)	**AD-16 (bg)**	**Yes**	**0.206**	**11/17/2021**	**NP**	**NaN**	**21**	**0.03303**	**0.04003**	**ln(x)**	**ShapiroWilk**
Boron, total (mg/L)	AD-23	No	n/a	n/a	NP	NaN	26	0.03241	0.01574	ln(x)	ShapiroWilk
Boron, total (mg/L)	**AD-27 (bg)**	**Yes**	**0.07**	**2/28/2019**	**NP**	**NaN**	**21**	**0.03118**	**0.01048**	**ln(x)**	**ShapiroWilk**
Boron, total (mg/L)	AD-34	No	n/a	n/a	NP	NaN	21	0.08124	0.02607	ln(x)	ShapiroWilk
Boron, total (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	0.8918	0.2304	x^(1/3)	ShapiroWilk
Boron, total (mg/L)	AD-36	No	n/a	n/a	NP	NaN	13	0.06062	0.006764	sqrt(x)	ShapiroWilk
Calcium, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	0.294	0.06475	normal	ShapiroWilk
Calcium, total (mg/L)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	1.178	0.3909	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-23	No	n/a	n/a	NP	NaN	22	0.307	0.1013	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-27 (bg)	No	n/a	n/a	NP	NaN	21	4.055	0.4789	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-34	No	n/a	n/a	NP	NaN	24	39.95	3.346	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	44.49	33.76	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-36	No	n/a	n/a	NP	NaN	16	0.3706	0.2906	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	6.41	1.281	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	16.38	6.751	normal	ShapiroWilk
Chloride, total (mg/L)	AD-23	No	n/a	n/a	NP	NaN	21	6.254	1.415	x^2	ShapiroWilk
Chloride, total (mg/L)	AD-27 (bg)	No	n/a	n/a	NP	NaN	21	10.34	2.006	normal	ShapiroWilk
Chloride, total (mg/L)	AD-34	No	n/a	n/a	NP	NaN	22	7.445	0.8006	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	11.76	4.671	sqrt(x)	ShapiroWilk
Chloride, total (mg/L)	AD-36	No	n/a	n/a	NP	NaN	17	9.541	1.325	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	0.1212	0.04954	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	0.1176	0.0382	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	AD-23	No	n/a	n/a	NP	NaN	21	0.1108	0.06475	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	**AD-27 (bg)**	**Yes**	**0.6176**	**5/11/2016**	**NP**	**NaN**	**21**	**0.1997**	**0.1016**	**ln(x)**	**ShapiroWilk**
Fluoride, total (mg/L)	AD-34	No	n/a	n/a	NP	NaN	25	0.7118	0.4883	sqrt(x)	ShapiroWilk
Fluoride, total (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	1.952	1.297	normal	ShapiroWilk
Fluoride, total (mg/L)	AD-36	No	n/a	n/a	NP	NaN	15	0.06533	0.01552	ln(x)	ShapiroWilk
pH, field (SU)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	4.142	0.6185	x^3	ShapiroWilk
pH, field (SU)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	4.148	0.4401	x^2	ShapiroWilk
pH, field (SU)	AD-23	No	n/a	n/a	NP	NaN	26	4.052	0.5142	normal	ShapiroWilk
pH, field (SU)	AD-27 (bg)	No	n/a	n/a	NP	NaN	21	3.657	0.5355	normal	ShapiroWilk
pH, field (SU)	AD-34	No	n/a	n/a	NP	NaN	28	3.524	0.3187	x^3	ShapiroWilk
pH, field (SU)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	4.796	0.9714	ln(x)	ShapiroWilk
pH, field (SU)	AD-36	No	n/a	n/a	NP	NaN	19	4.438	0.4102	x^3	ShapiroWilk
Sulfate, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	4.473	1.473	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	18.52	10.87	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-23	No	n/a	n/a	NP	NaN	21	9.814	2.035	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	**AD-27 (bg)**	**Yes**	**92**	**11/15/2016**	**NP**	**NaN**	**21**	**58.22**	**9.785**	**ln(x)**	**ShapiroWilk**
Sulfate, total (mg/L)	AD-34	No	n/a	n/a	NP	NaN	22	1085	134.5	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	151	40.79	normal	ShapiroWilk
Sulfate, total (mg/L)	AD-36	No	n/a	n/a	NP	NaN	14	3.443	0.6521	x^(1/3)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	24	71.23	20.76	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-16 (bg)	No	n/a	n/a	NP	NaN	21	113.4	16.04	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-23	No	n/a	n/a	NP	NaN	22	72.77	16.41	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-27 (bg)	No	n/a	n/a	NP	NaN	21	191.9	37.63	x^5	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-34	No	n/a	n/a	NP	NaN	28	1527	173.6	x^3	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-8 (bg)	No	n/a	n/a	NP	NaN	21	297.7	80.75	normal	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-36	No	n/a	n/a	NP	NaN	13	56.62	13.14	ln(x)	ShapiroWilk

Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.1148, low cutoff = -0.00009613, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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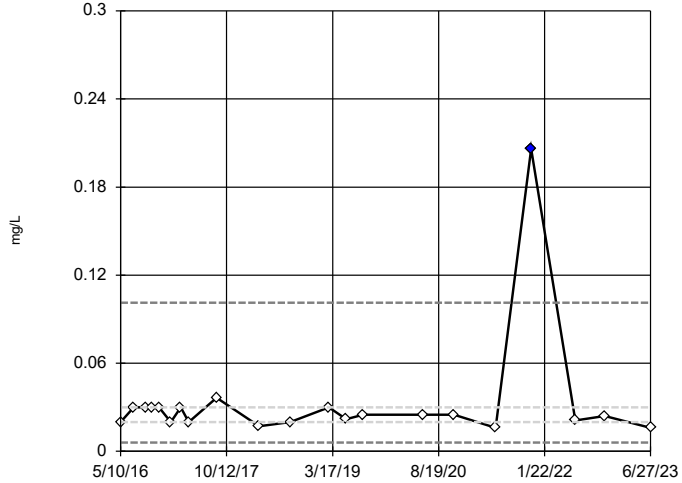
Tukey's Outlier Screening

AD-16 (bg)



n = 21

Outlier is drawn as solid. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.1013, low cutoff = 0.005926, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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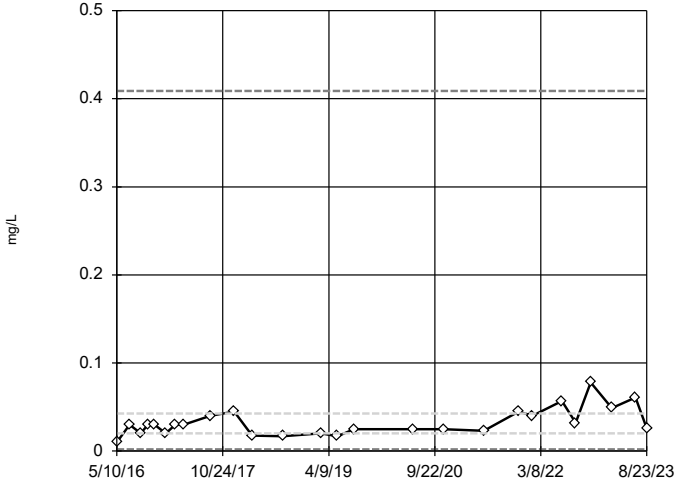
Tukey's Outlier Screening

AD-23



n = 26

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.4087, low cutoff = 0.002081, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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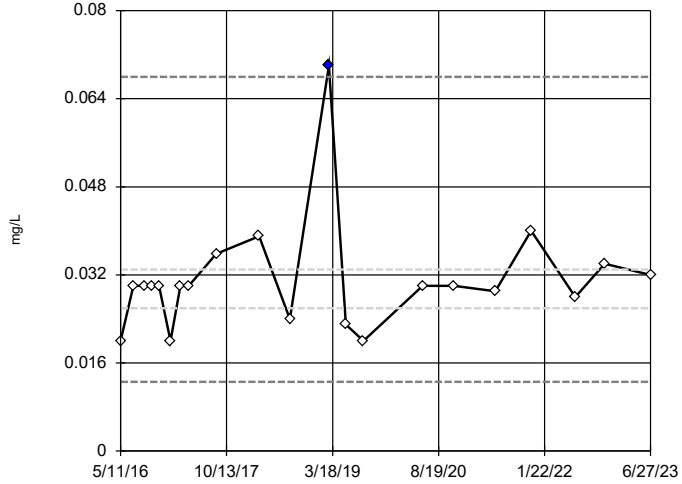
Tukey's Outlier Screening

AD-27 (bg)



n = 21

Outlier is drawn as solid. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

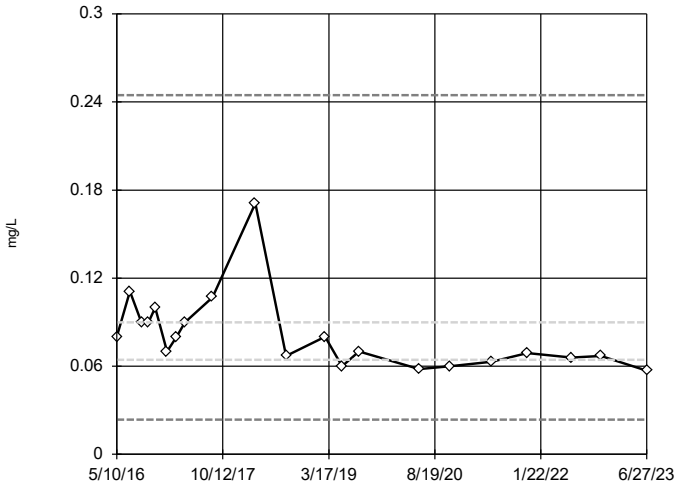
High cutoff = 0.06795, low cutoff = 0.01258, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-34



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.2447, low cutoff = 0.02372, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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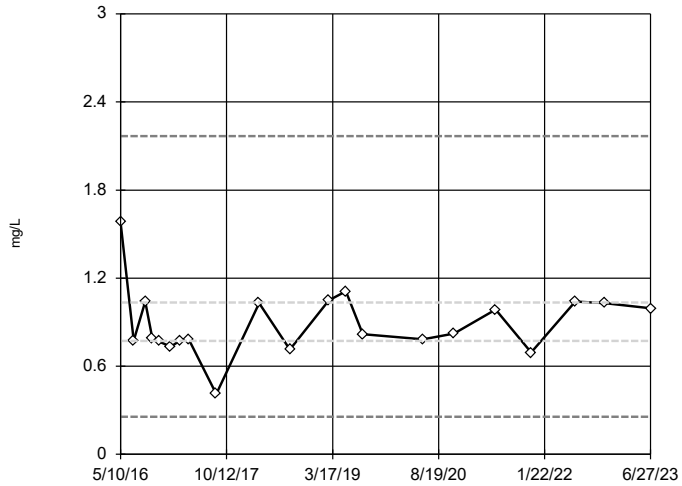
Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.167, low cutoff = 0.2558, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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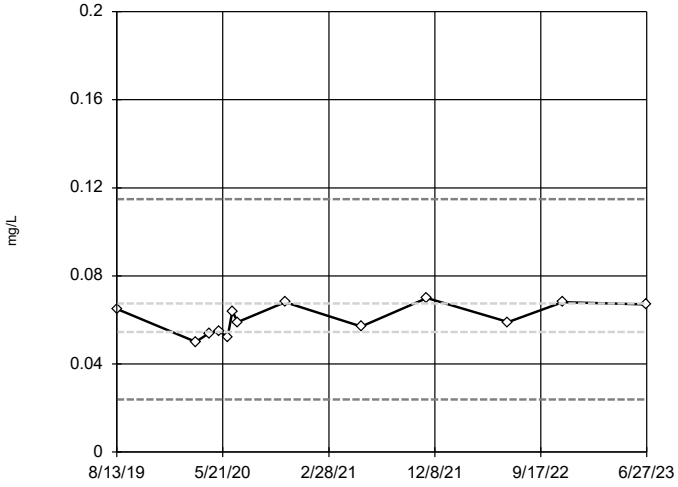
Tukey's Outlier Screening

AD-36



n = 13

No outliers found. Tukey's method selected by user.

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.1148, low cutoff = 0.02383, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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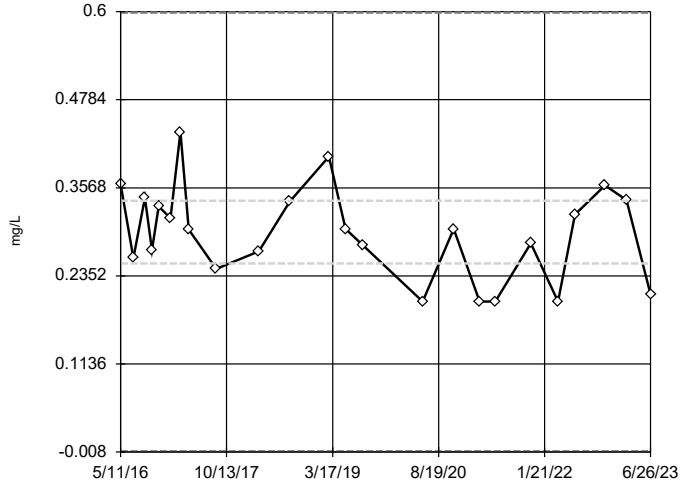
Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

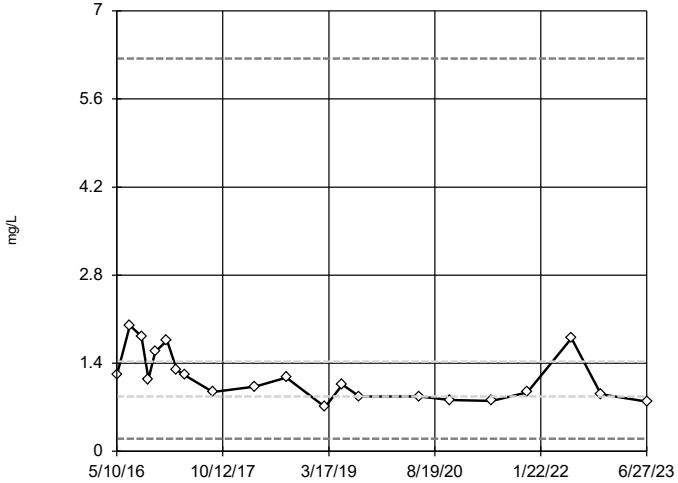
High cutoff = 0.5985, low cutoff = -0.007, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.244, low cutoff = 0.1996, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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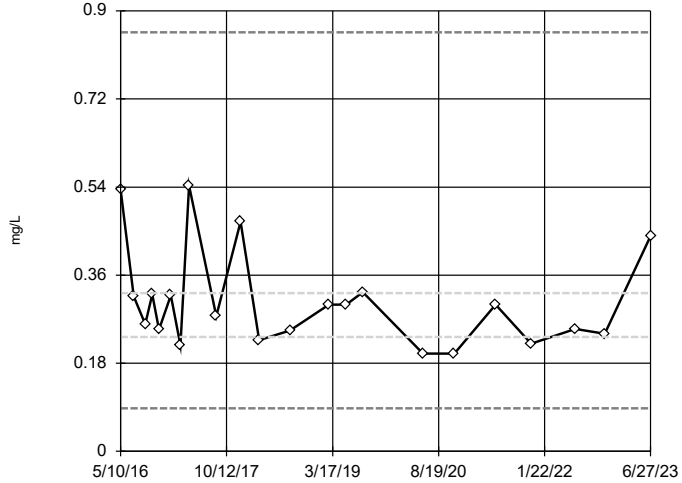
Tukey's Outlier Screening

AD-23



n = 22

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.8559, low cutoff = 0.08808, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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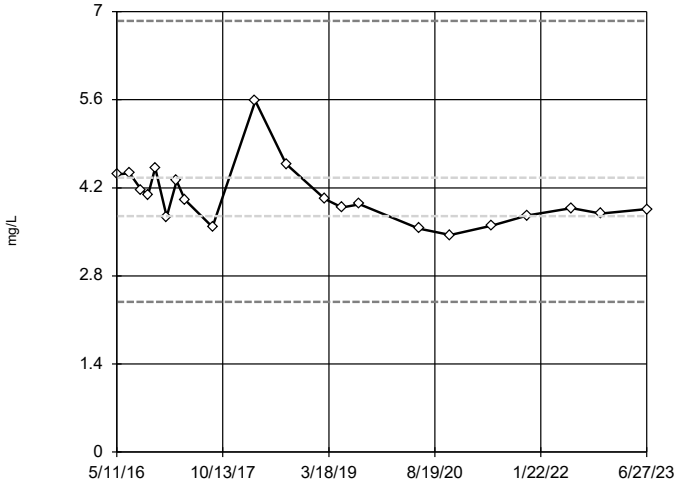
Tukey's Outlier Screening

AD-27 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.851, low cutoff = 2.386, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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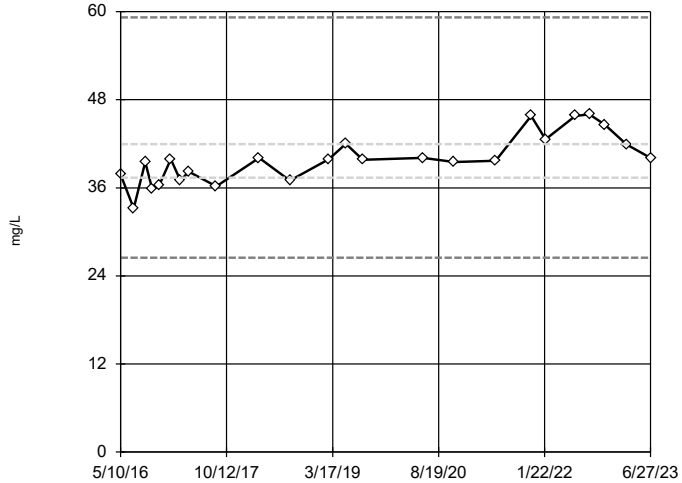
Tukey's Outlier Screening

AD-34



n = 24

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

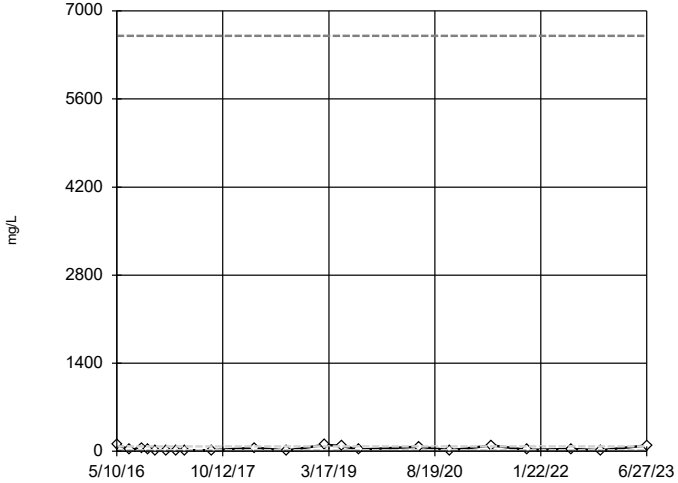
High cutoff = 59.21, low cutoff = 26.5, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6604, low cutoff = 0.221, based on IQR multiplier of 3.

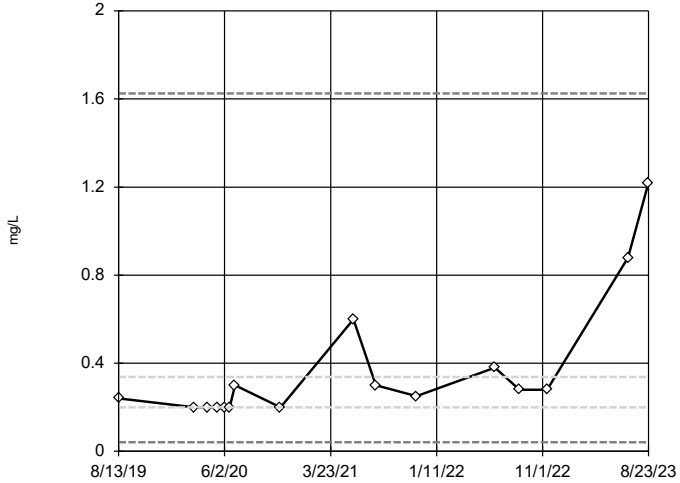
Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Tukey's Outlier Screening

AD-36



n = 16

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1.625, low cutoff = 0.04157, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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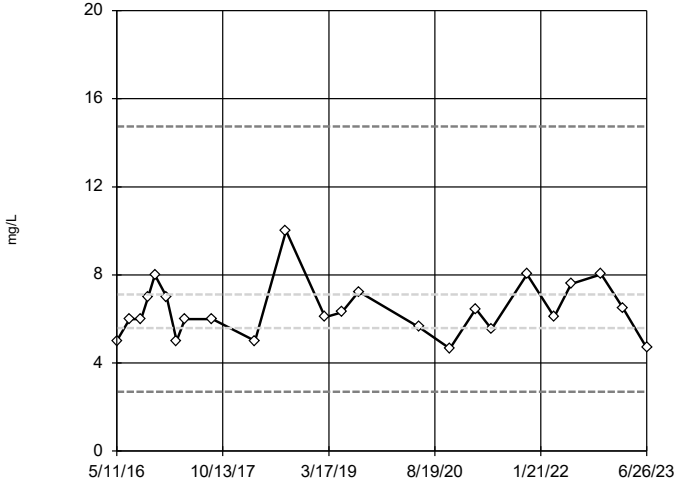
Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 14.75, low cutoff = 2.696, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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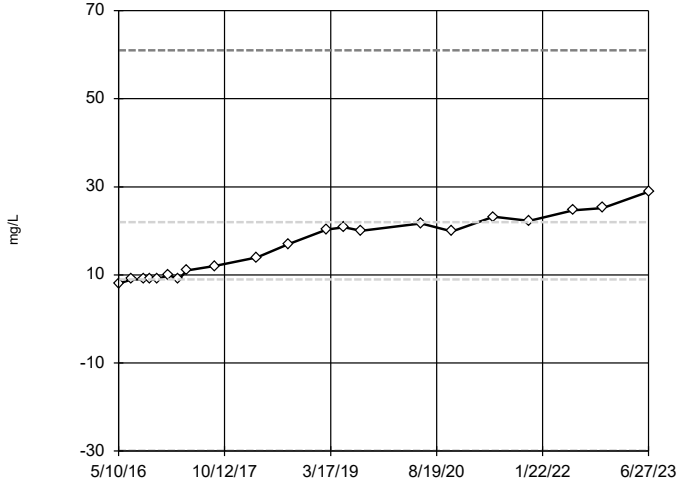
Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

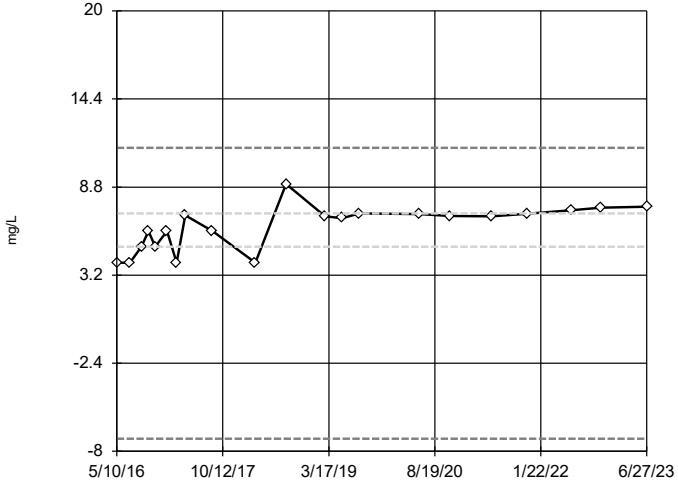
High cutoff = 61, low cutoff = -30, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-23



n = 21

No outliers found. Tukey's method selected by user.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 11.29, low cutoff = -7.202, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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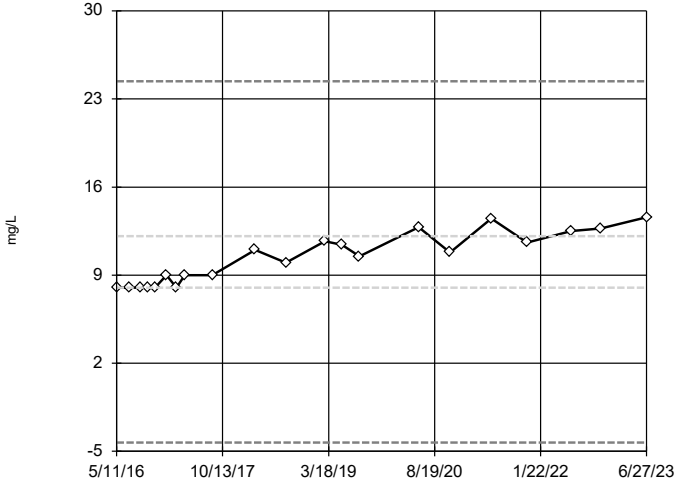
Tukey's Outlier Screening

AD-27 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 24.4, low cutoff = -4.3, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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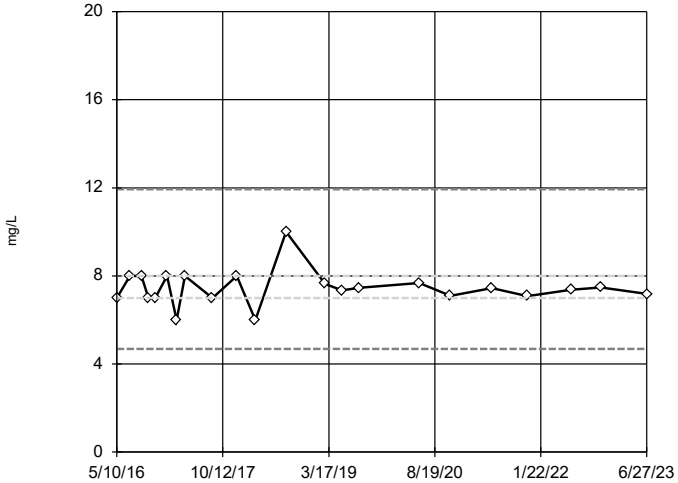
Tukey's Outlier Screening

AD-34



n = 22

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 11.94, low cutoff = 4.689, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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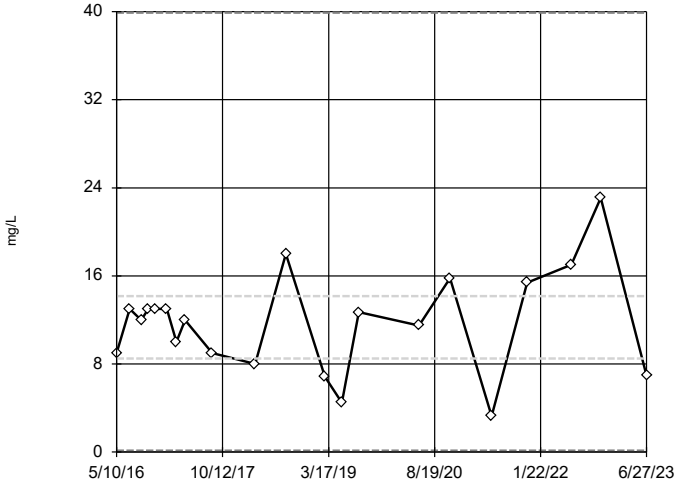
Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were square root transformed to achieve best W statistic (graph shown in original units).

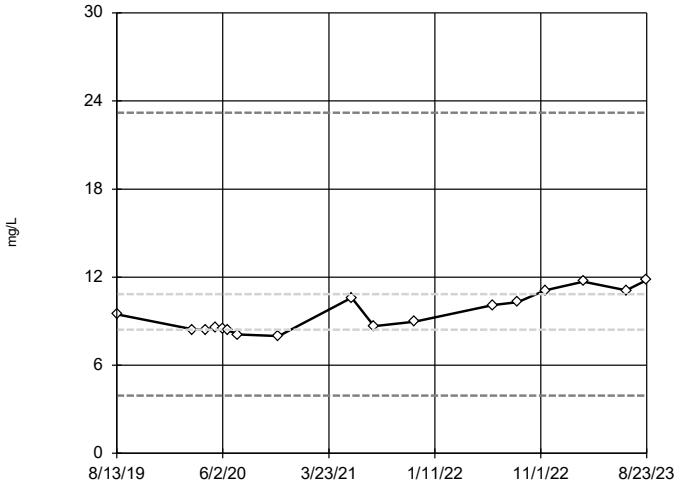
High cutoff = 39.9, low cutoff = 0.1311, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-36



n = 17

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 23.19, low cutoff = 3.938, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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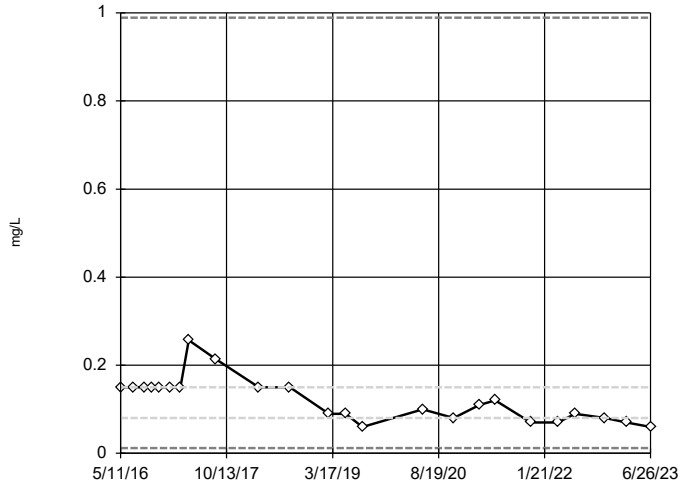
Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.9888, low cutoff = 0.01214, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:54 AM

Pirkey Landfill Data: Pirkey Landfill

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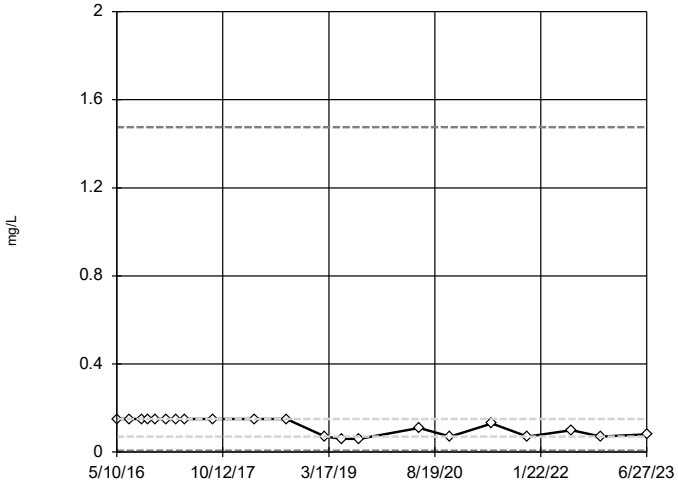
Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1.476, low cutoff = 0.007114, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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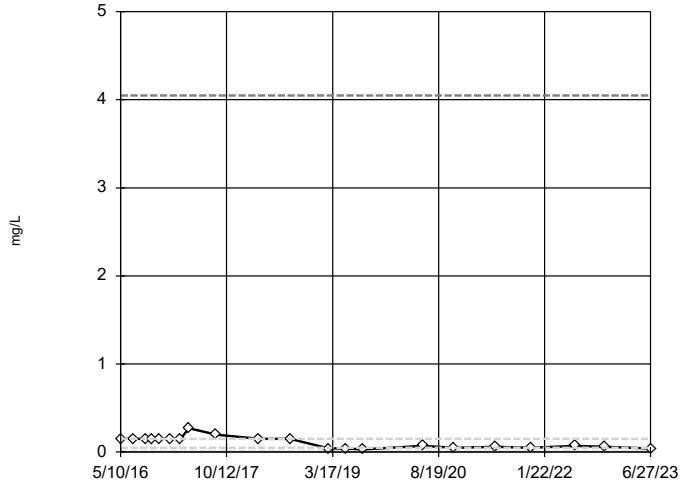
Tukey's Outlier Screening

AD-23



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

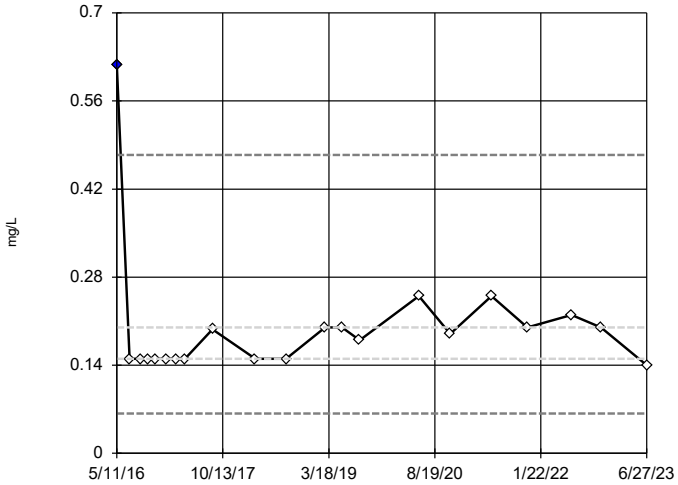
High cutoff = 4.05, low cutoff = 0.001852, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-27 (bg)



n = 21

Outlier is drawn as solid. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.4741, low cutoff = 0.06328, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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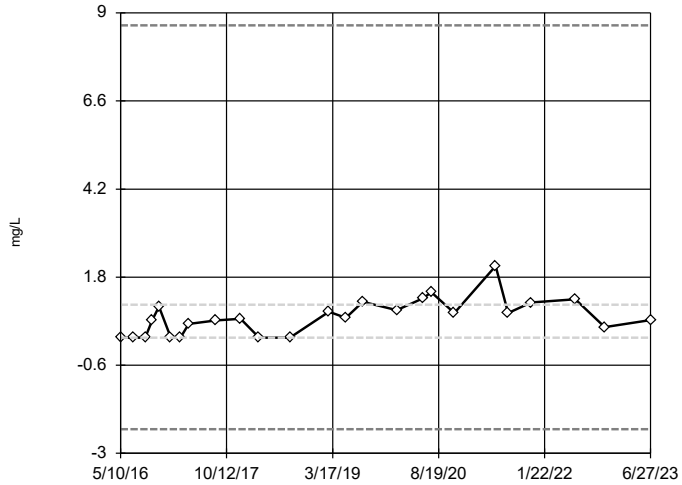
Tukey's Outlier Screening

AD-34



n = 25

No outliers found. Tukey's method selected by user.

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 8.661, low cutoff = -2.339, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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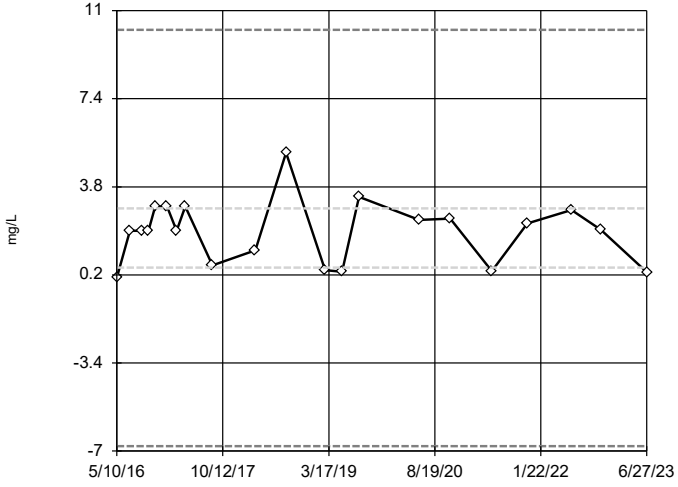
Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 10.22, low cutoff = -6.801, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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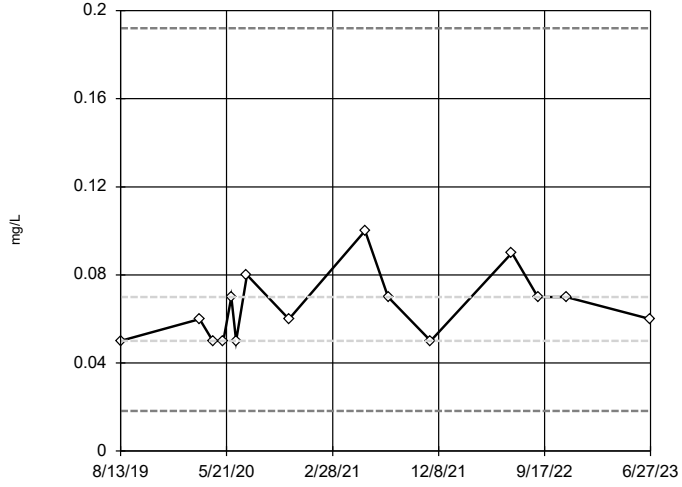
Tukey's Outlier Screening

AD-36



n = 15

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

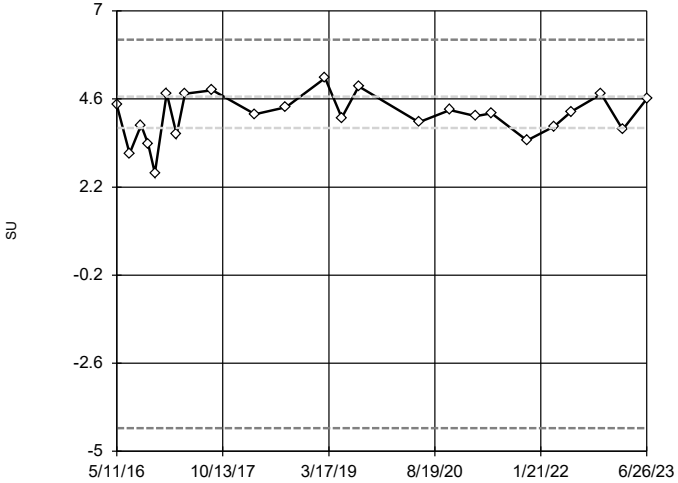
High cutoff = 0.1921, low cutoff = 0.01822, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.217, low cutoff = -4.37, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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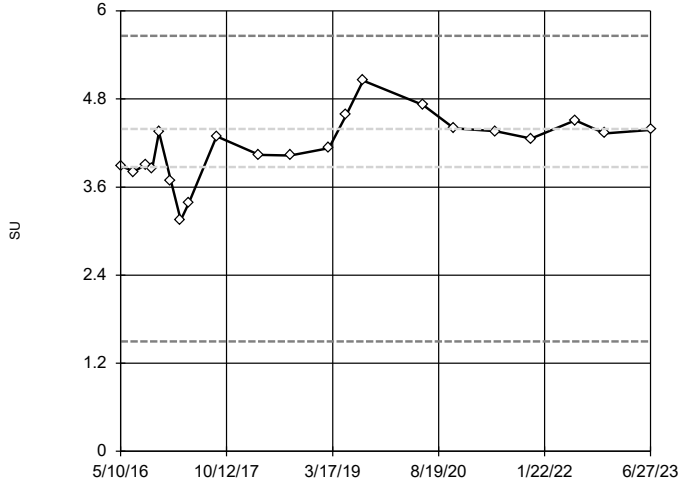
Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 5.66, low cutoff = 1.499, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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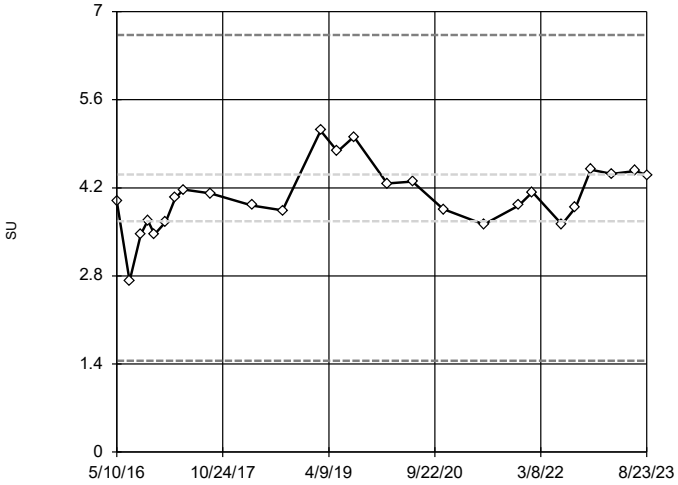
Tukey's Outlier Screening

AD-23



n = 26

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 6.63, low cutoff = 1.45, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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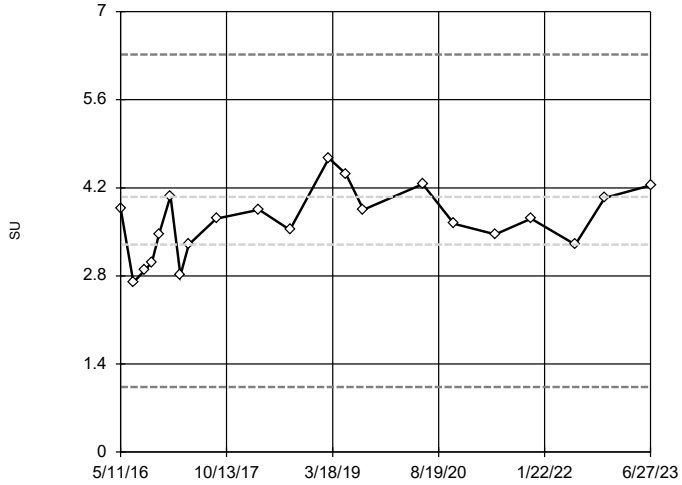
Tukey's Outlier Screening

AD-27 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

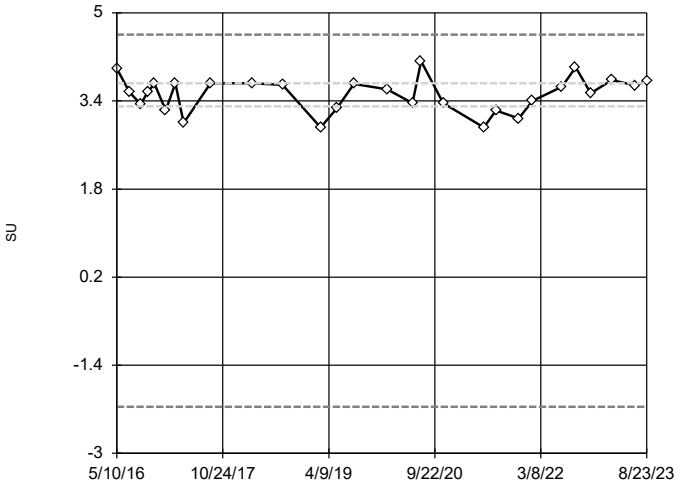
High cutoff = 6.32, low cutoff = 1.035, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-34



n = 28

No outliers found. Tukey's method selected by user.

Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 4.604, low cutoff = -2.153, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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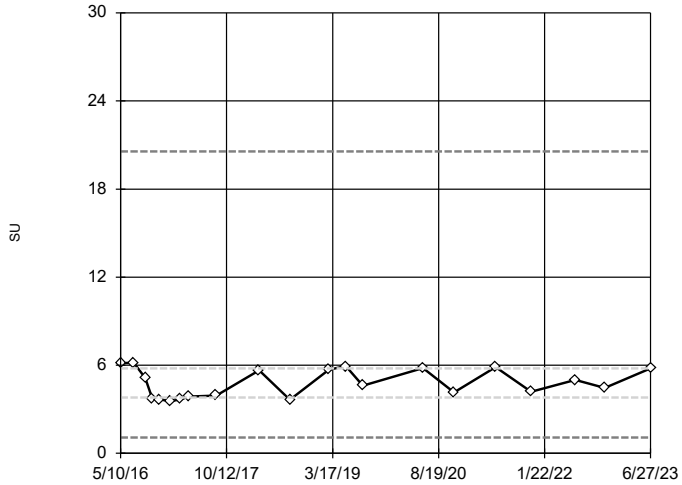
Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 20.56, low cutoff = 1.071, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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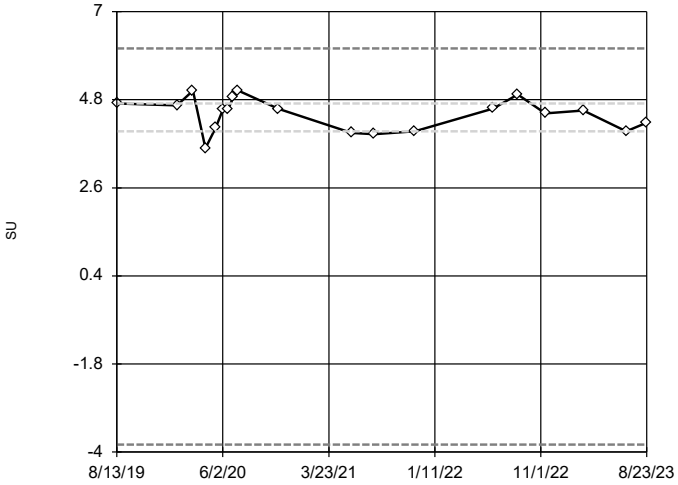
Tukey's Outlier Screening

AD-36



n = 19

No outliers found. Tukey's method selected by user.

Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.078, low cutoff = -3.815, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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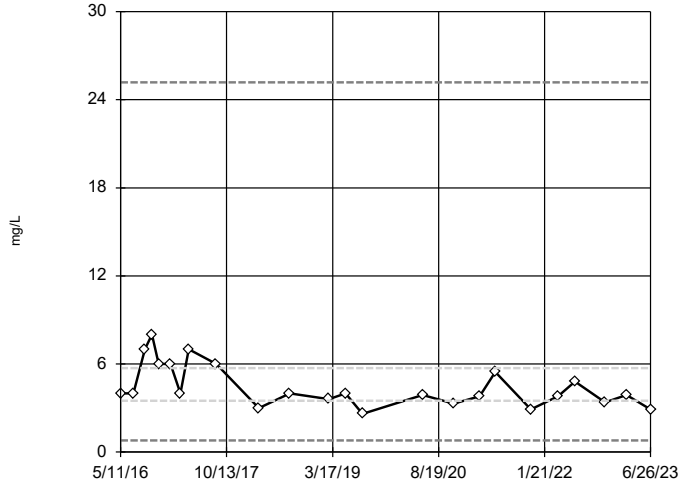
Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

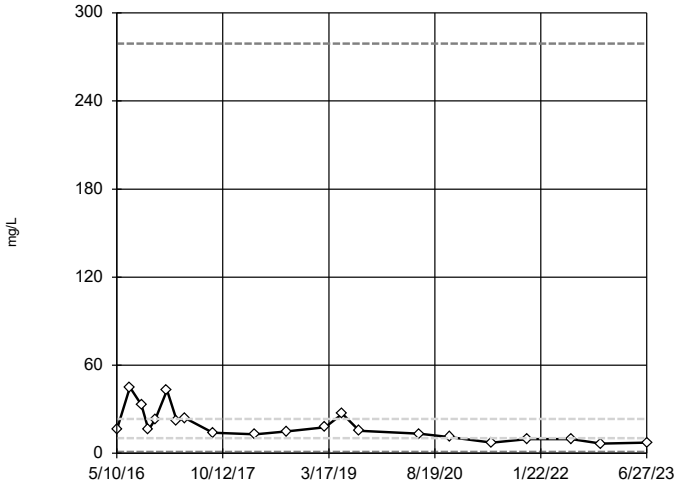
High cutoff = 25.17, low cutoff = 0.7943, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 279, low cutoff = 0.867, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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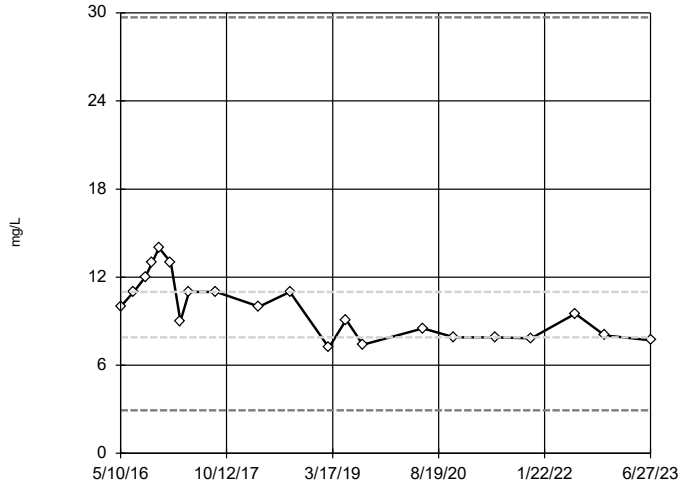
Tukey's Outlier Screening

AD-23



n = 21

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 29.7, low cutoff = 2.926, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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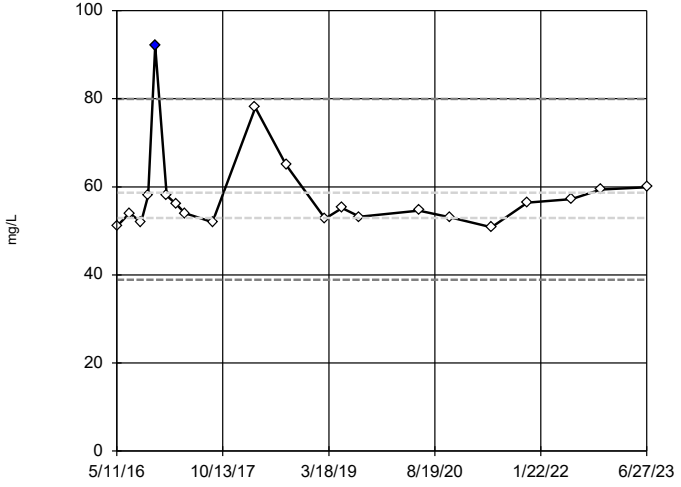
Tukey's Outlier Screening

AD-27 (bg)



n = 21

Outlier is drawn as solid. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 79.95, low cutoff = 38.87, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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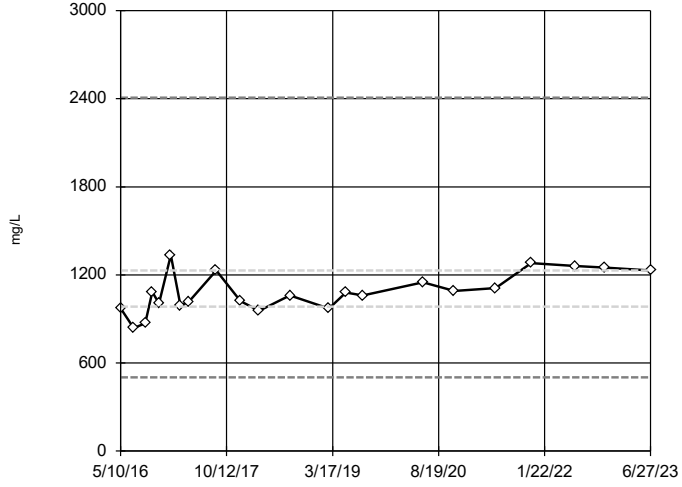
Tukey's Outlier Screening

AD-34



n = 22

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

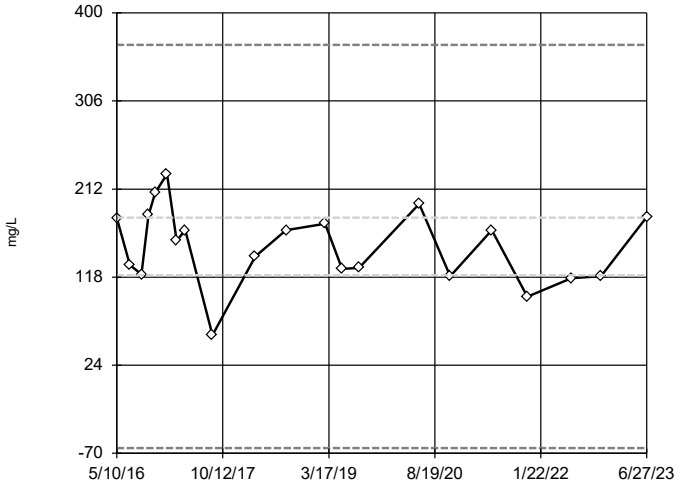
High cutoff = 2406, low cutoff = 502.7, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 366, low cutoff = -64.5, based on IQR multiplier of 3.

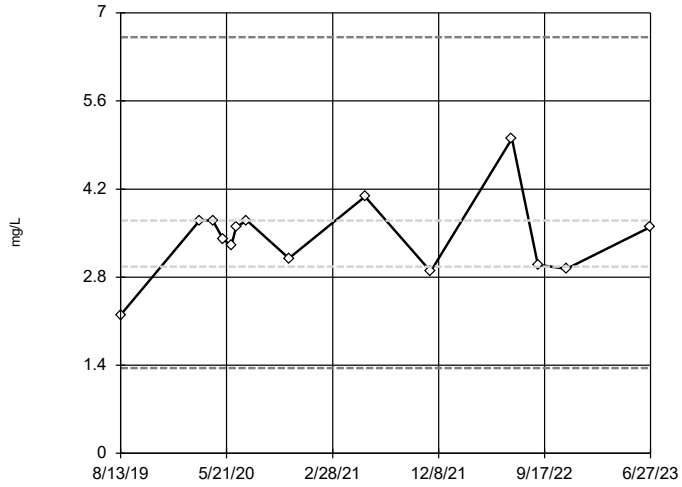
Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Tukey's Outlier Screening

AD-36



n = 14

No outliers found. Tukey's method selected by user.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.612, low cutoff = 1.354, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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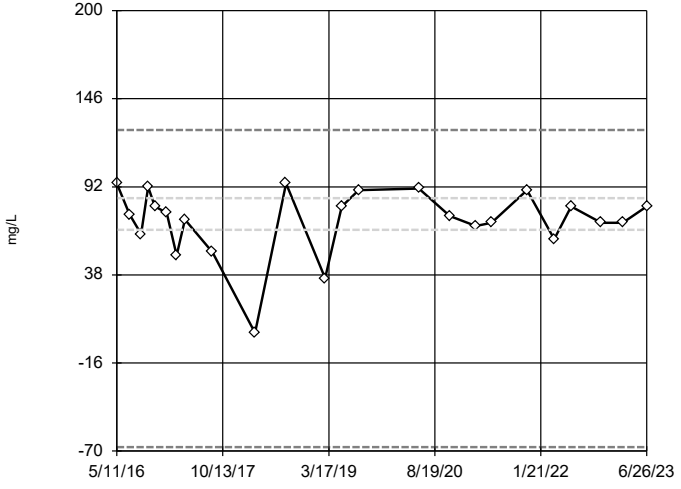
Tukey's Outlier Screening

AD-12 (bg)



n = 24

No outliers found. Tukey's method selected by user.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 126.9, low cutoff = -67.56, based on IQR multiplier of 3.

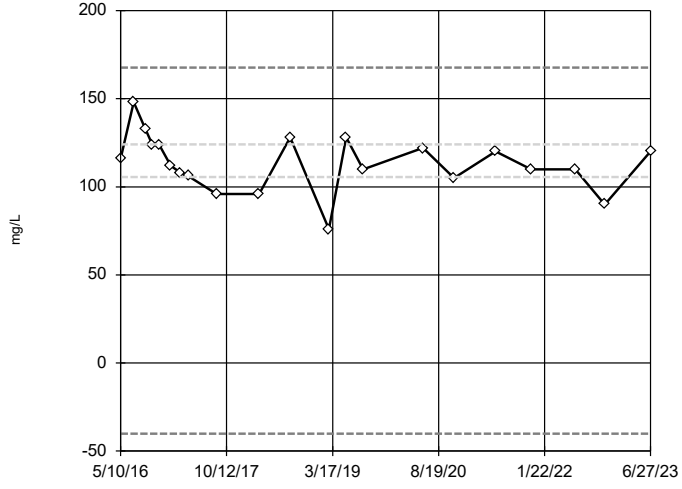
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Tukey's Outlier Screening

AD-16 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were square transformed to achieve best W statistic (graph shown in original units).

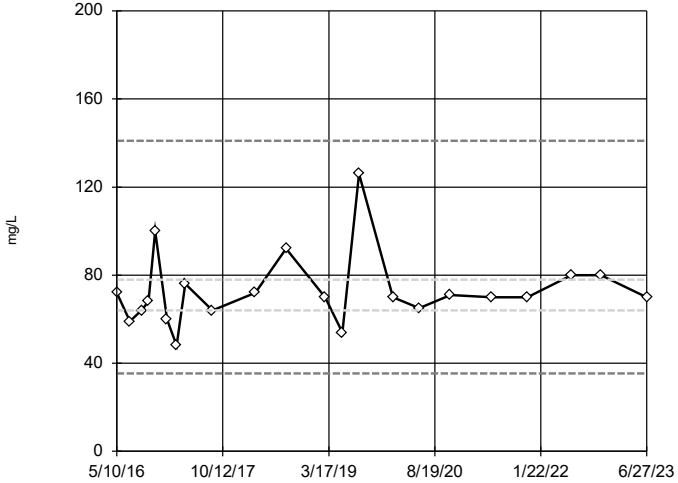
High cutoff = 167.7, low cutoff = -40.07, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-23



n = 22

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 141, low cutoff = 35.39, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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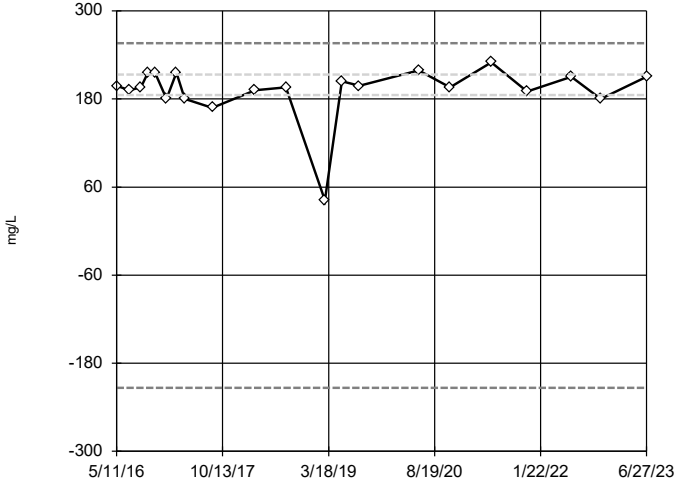
Tukey's Outlier Screening

AD-27 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 256.1, low cutoff = -213.6, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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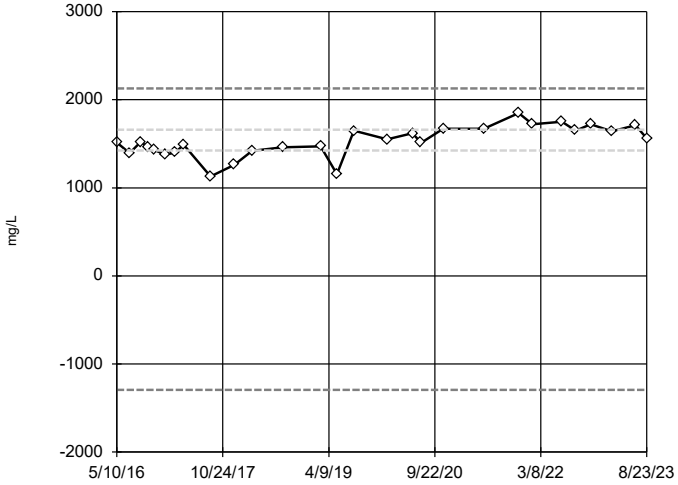
Tukey's Outlier Screening

AD-34



n = 28

No outliers found. Tukey's method selected by user.

Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2128, low cutoff = -1295, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

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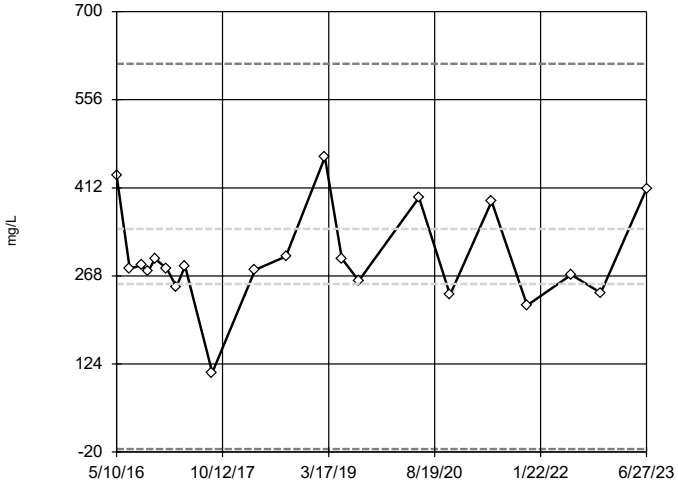
Tukey's Outlier Screening

AD-8 (bg)



n = 21

No outliers found. Tukey's method selected by user.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

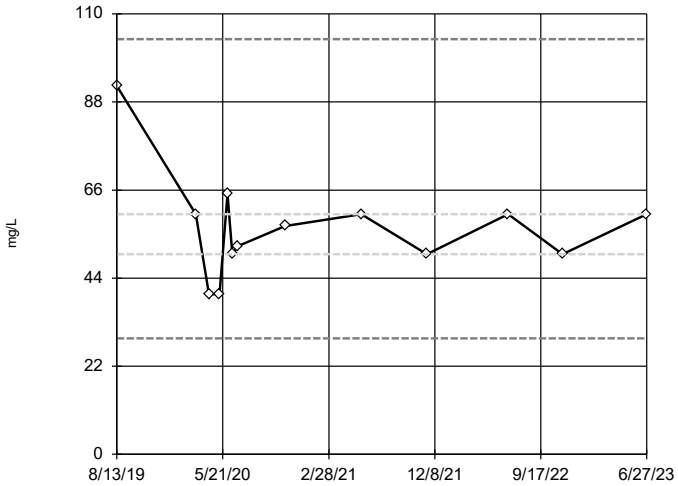
High cutoff = 615, low cutoff = -15, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Tukey's Outlier Screening

AD-36



n = 13

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 103.7, low cutoff = 28.94, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 8:55 AM

Pirkey Landfill Data: Pirkey Landfill

Welch's t-test/Mann-Whitney - Significant Results

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill Printed 12/15/2023, 3:53 PM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
Boron, total (mg/L)	**AD-23**	**2.728**	**Yes**	**0.01**	**Yes**	**Mann-W**
Boron, total (mg/L)	**AD-34**	**-2.609**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium, total (mg/L)	**AD-34**	**3.076**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride, total (mg/L)	**AD-12 (bg)**	**-3.223**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate, total (mg/L)	**AD-16 (bg)**	**-3.543**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate, total (mg/L)	**AD-34**	**2.729**	**Yes**	**0.01**	**Yes**	**Mann-W**
Total Dissolved Solids [TDS] (mg/L)	**AD-34**	**4.148**	**Yes**	**0.01**	**Yes**	**Mann-W**

Welch's t-test/Mann-Whitney - All Results

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill Printed 12/15/2023, 3:53 PM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
Boron, total (mg/L)	AD-12 (bg)	-1.775	No	0.01	No	Mann-W
Boron, total (mg/L)	AD-16 (bg)	-1.157	No	0.01	No	Mann-W
Boron, total (mg/L)	**AD-23**	**2.728**	**Yes**	**0.01**	**Yes**	**Mann-W**
Boron, total (mg/L)	AD-27 (bg)	1.195	No	0.01	No	Mann-W
Boron, total (mg/L)	**AD-34**	**-2.609**	**Yes**	**0.01**	**Yes**	**Mann-W**
Boron, total (mg/L)	AD-8 (bg)	0.5843	No	0.01	No	Mann-W
Boron, total (mg/L)	AD-36	2.149	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-12 (bg)	-1.195	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-16 (bg)	-0.9682	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-23	-1.255	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-27 (bg)	-2.452	No	0.01	No	Mann-W
Calcium, total (mg/L)	**AD-34**	**3.076**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium, total (mg/L)	AD-8 (bg)	0.3503	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-36	2.504	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-12 (bg)	0.2992	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-16 (bg)	2.517	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-23	2.426	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-27 (bg)	2.003	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-34	-0.6322	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-8 (bg)	1.055	No	0.01	No	Mann-W
Chloride, total (mg/L)	AD-36	2.49	No	0.01	No	Mann-W
Fluoride, total (mg/L)	**AD-12 (bg)**	**-3.223**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride, total (mg/L)	AD-16 (bg)	-2.364	No	0.01	No	Mann-W
Fluoride, total (mg/L)	AD-23	-2.276	No	0.01	No	Mann-W
Fluoride, total (mg/L)	AD-27 (bg)	1.564	No	0.01	No	Mann-W
Fluoride, total (mg/L)	AD-34	1.622	No	0.01	No	Mann-W
Fluoride, total (mg/L)	AD-8 (bg)	-0.3519	No	0.01	No	Mann-W
Fluoride, total (mg/L)	AD-36	1.552	No	0.01	No	Mann-W
pH, field (SU)	AD-12 (bg)	-0.3578	No	0.01	No	Mann-W
pH, field (SU)	AD-16 (bg)	1.829	No	0.01	No	Mann-W
pH, field (SU)	AD-23	0.3164	No	0.01	No	Mann-W
pH, field (SU)	AD-27 (bg)	0.1559	No	0.01	No	Mann-W
pH, field (SU)	AD-34	-0.3532	No	0.01	No	Mann-W
pH, field (SU)	AD-8 (bg)	0.506	No	0.01	No	Mann-W
pH, field (SU)	AD-36	-1.675	No	0.01	No	Mann-W
Sulfate, total (mg/L)	AD-12 (bg)	-2.07	No	0.01	No	Mann-W
Sulfate, total (mg/L)	**AD-16 (bg)**	**-3.543**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate, total (mg/L)	AD-23	-2.385	No	0.01	No	Mann-W
Sulfate, total (mg/L)	AD-27 (bg)	0.1948	No	0.01	No	Mann-W
Sulfate, total (mg/L)	**AD-34**	**2.729**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate, total (mg/L)	AD-8 (bg)	-1.754	No	0.01	No	Mann-W
Sulfate, total (mg/L)	AD-36	-0.4497	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	-0.5685	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-16 (bg)	-1.132	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-23	1.076	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-27 (bg)	0.4303	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	**AD-34**	**4.148**	**Yes**	**0.01**	**Yes**	**Mann-W**
Total Dissolved Solids [TDS] (mg/L)	AD-8 (bg)	-1.13	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-36	0.1459	No	0.01	No	Mann-W

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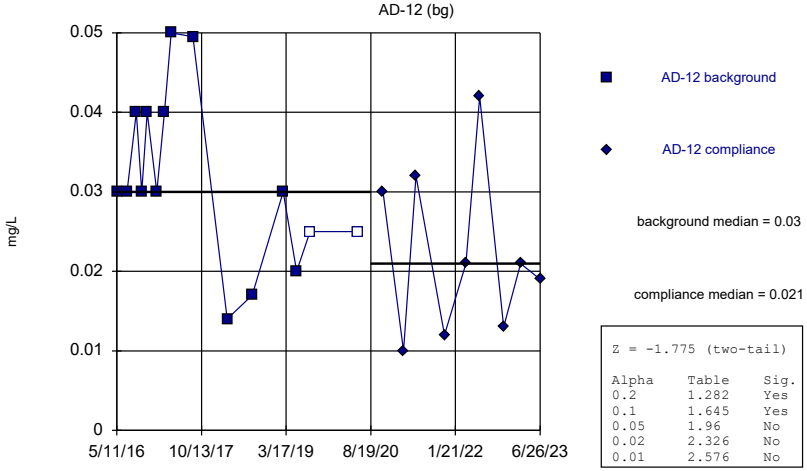
Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -1.775 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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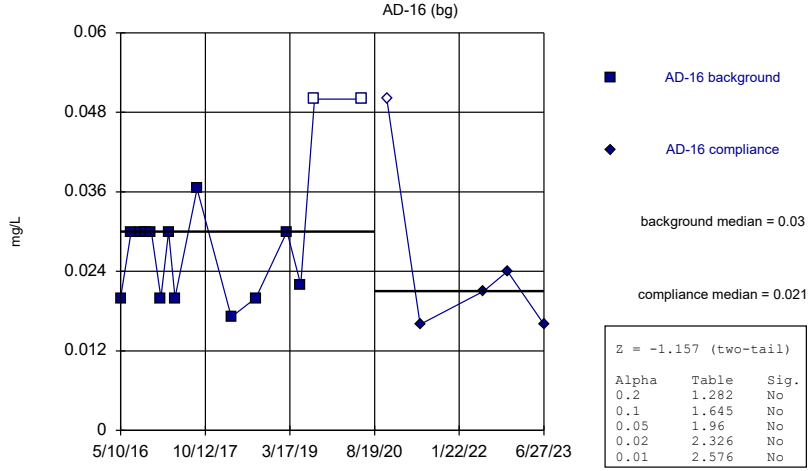
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Z = -1.157 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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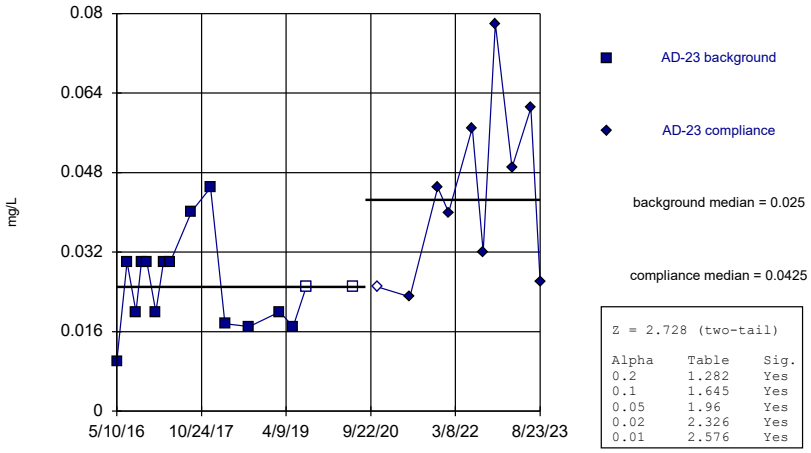
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Z = 2.728 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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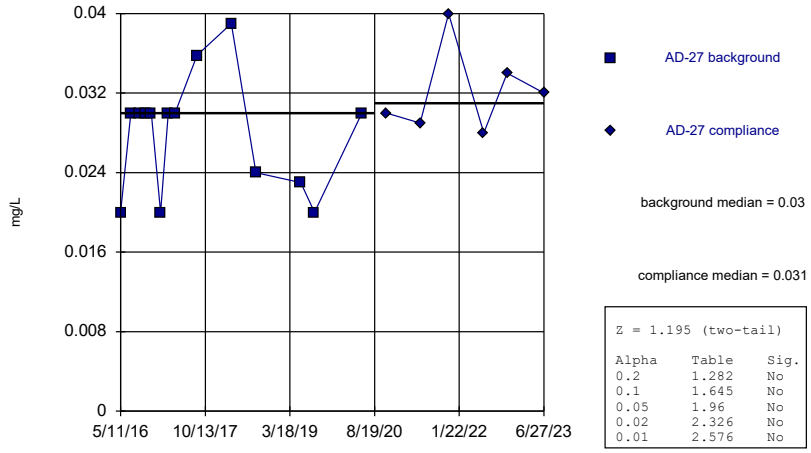
Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



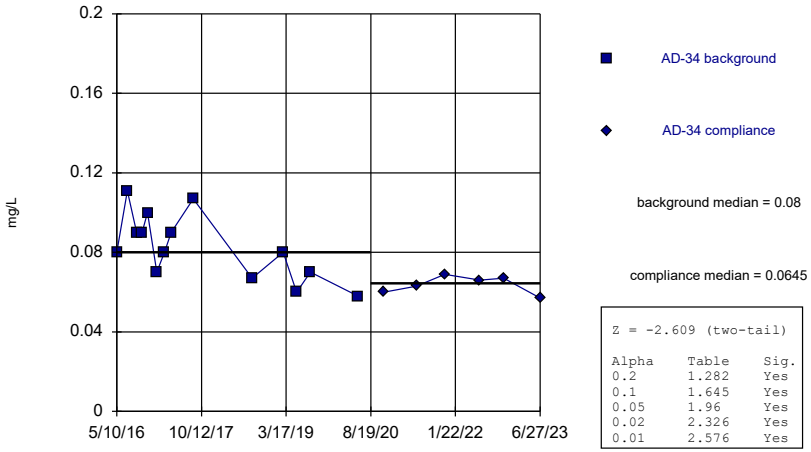
Z = 1.195 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = -2.609 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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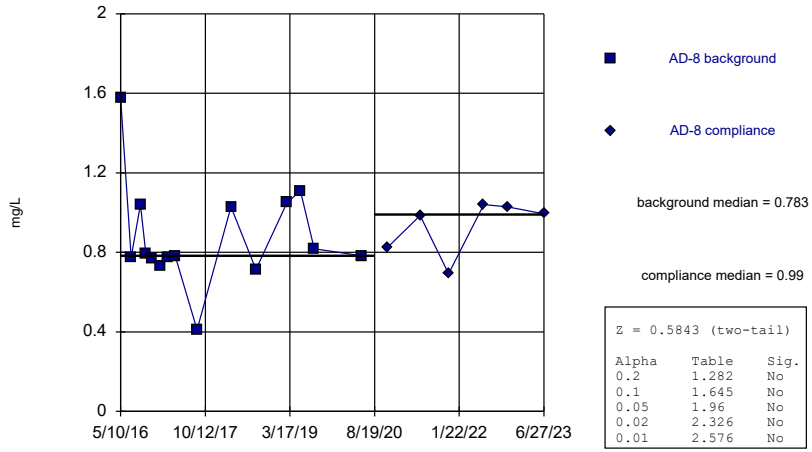
Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = 0.5843 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Boron, total Analysis Run 12/15/2023 3:50 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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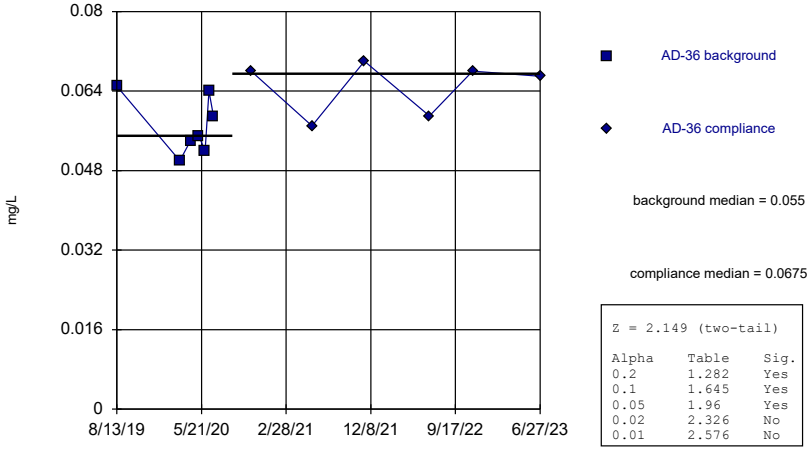
Mann-Whitney (Wilcoxon Rank Sum)

AD-36



Z = 2.149 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Boron, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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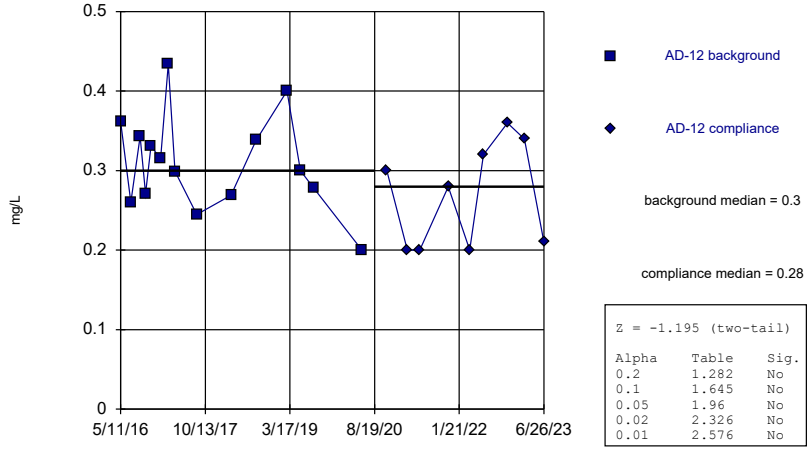
Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -1.195 (two-tail)

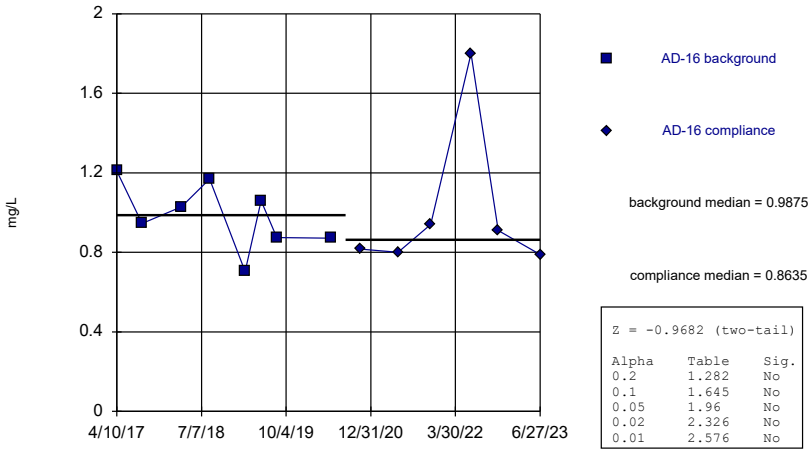
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Z = -0.9682 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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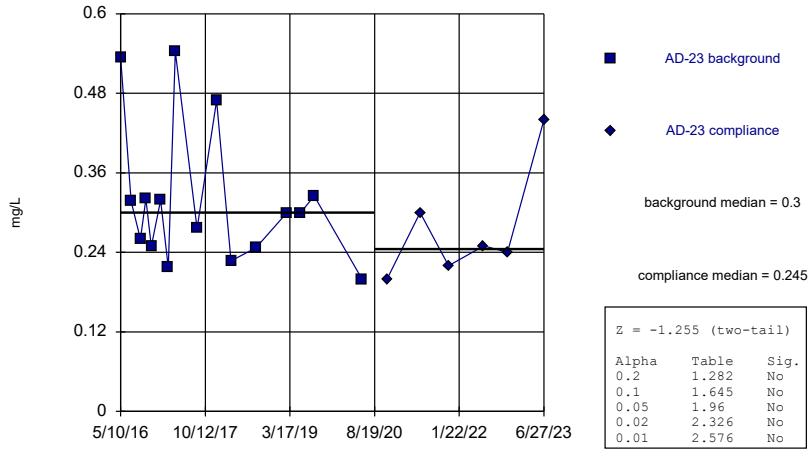
Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Z = -1.255 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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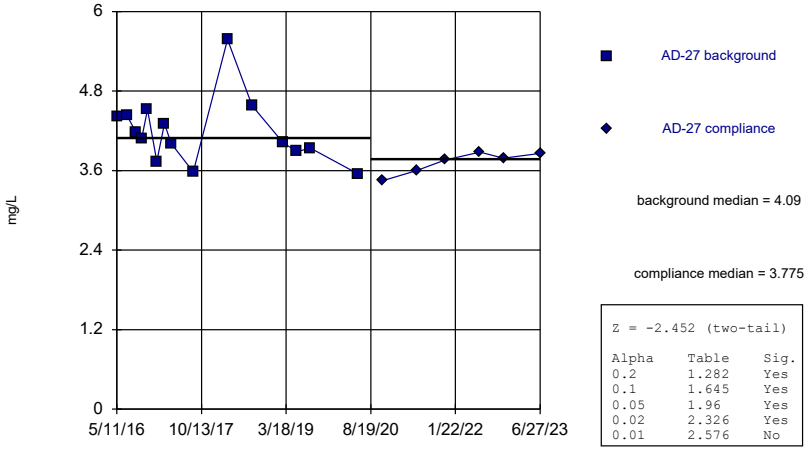
Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



Z = -2.452 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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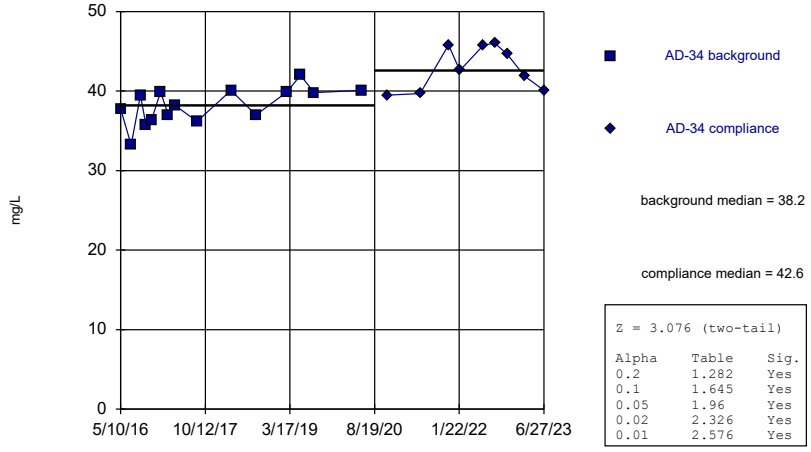
Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = 3.076 (two-tail)

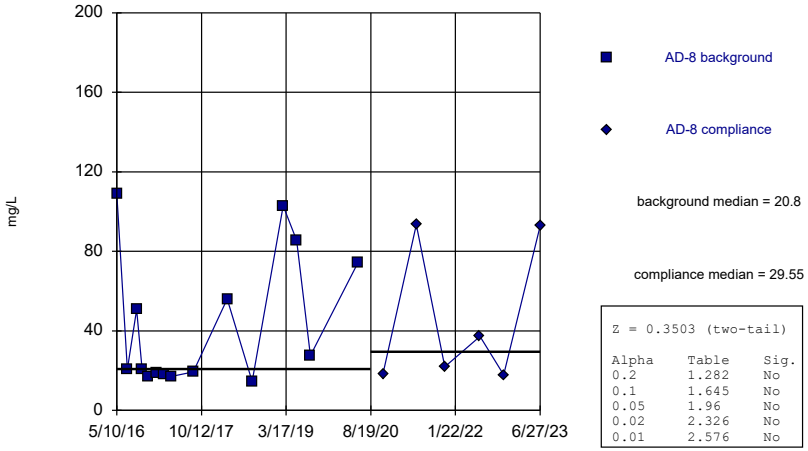
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = 0.3503 (two-tail)

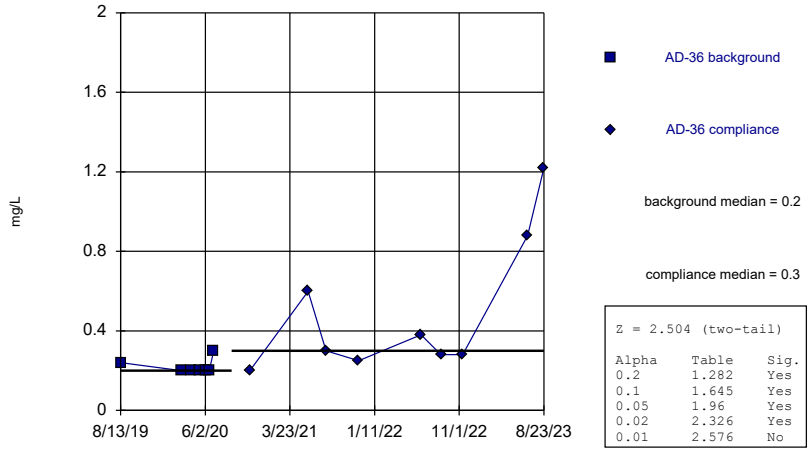
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-36



Z = 2.504 (two-tail)

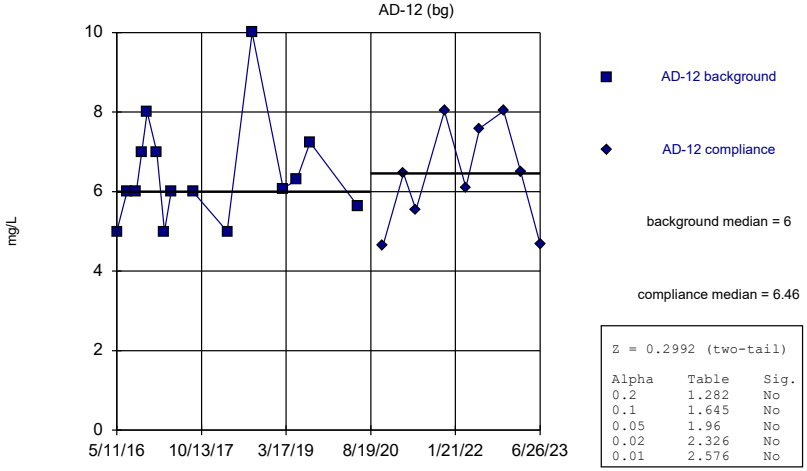
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = 0.2992 (two-tail)

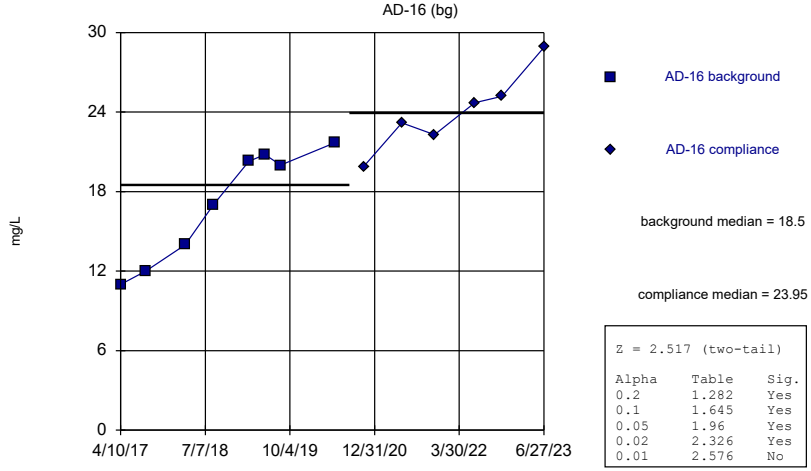
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Z = 2.517 (two-tail)

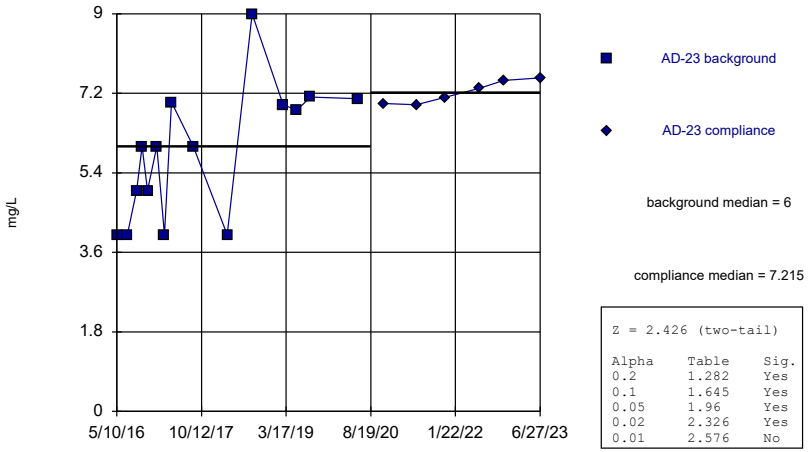
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Z = 2.426 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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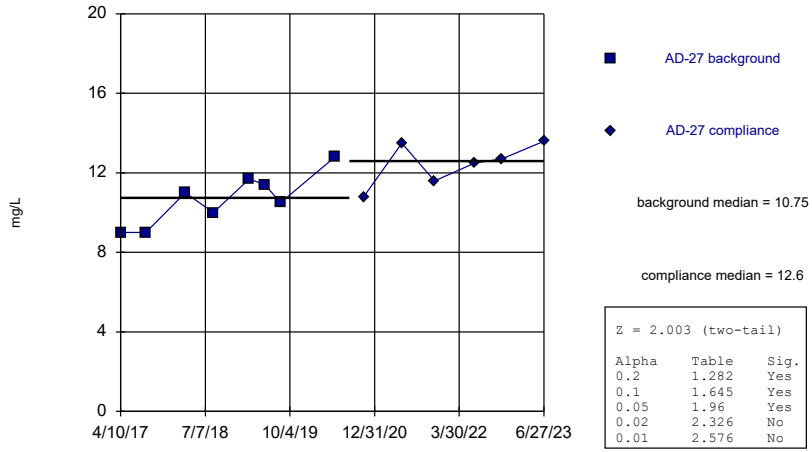
Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



Z = 2.003 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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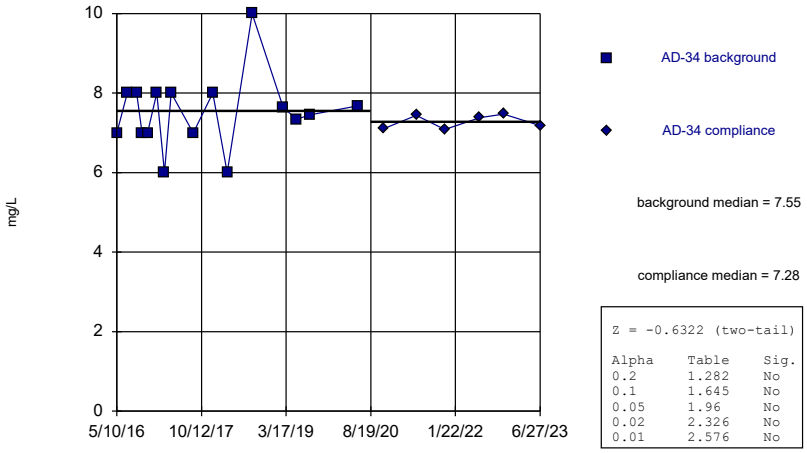
Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = -0.6322 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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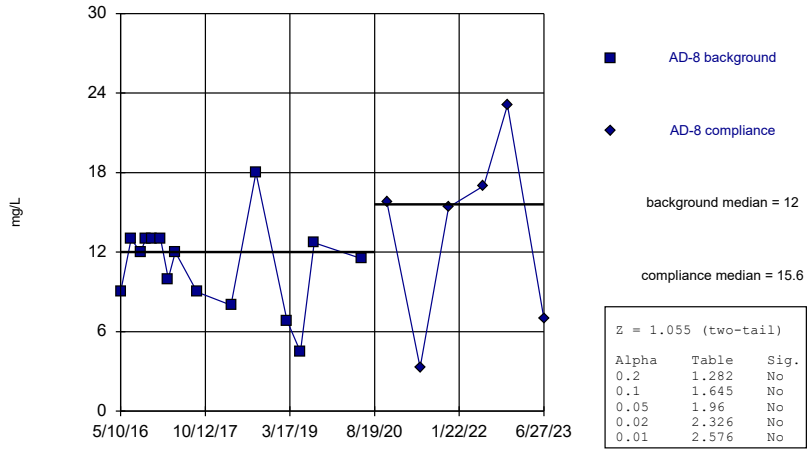
Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = 1.055 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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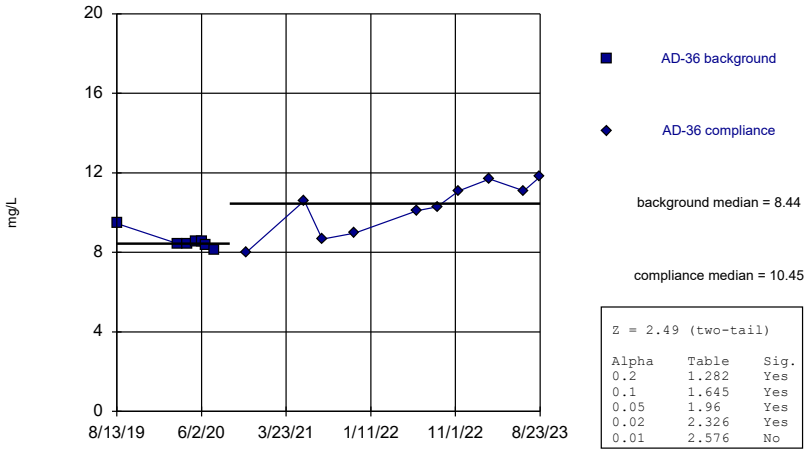
Mann-Whitney (Wilcoxon Rank Sum)

AD-36



Constituent: Chloride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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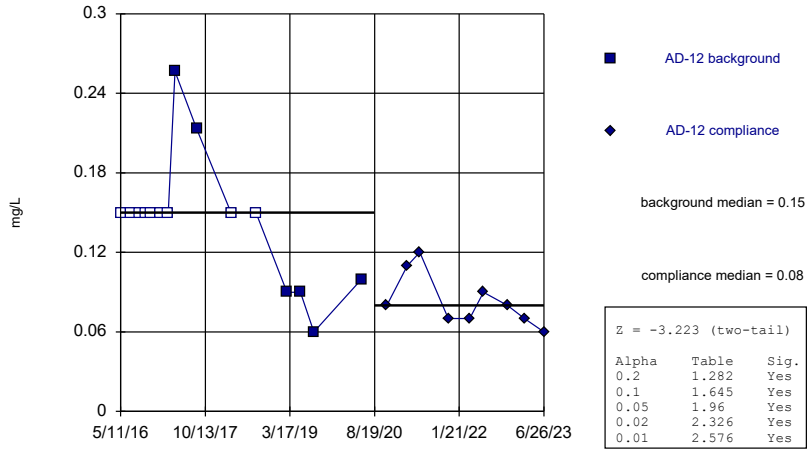
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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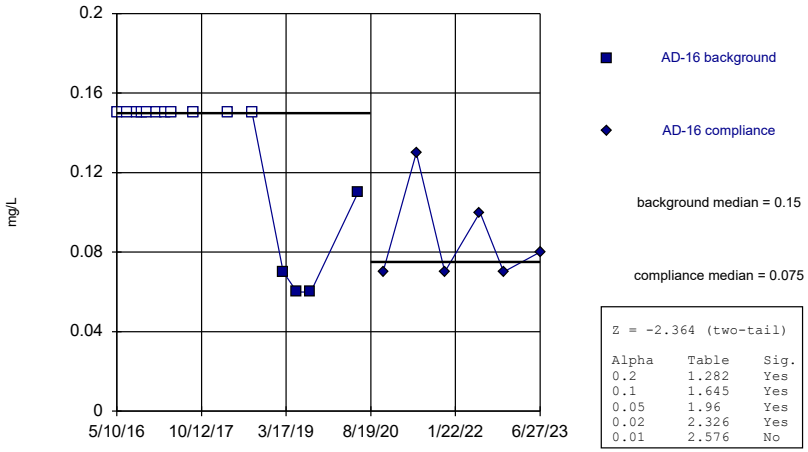
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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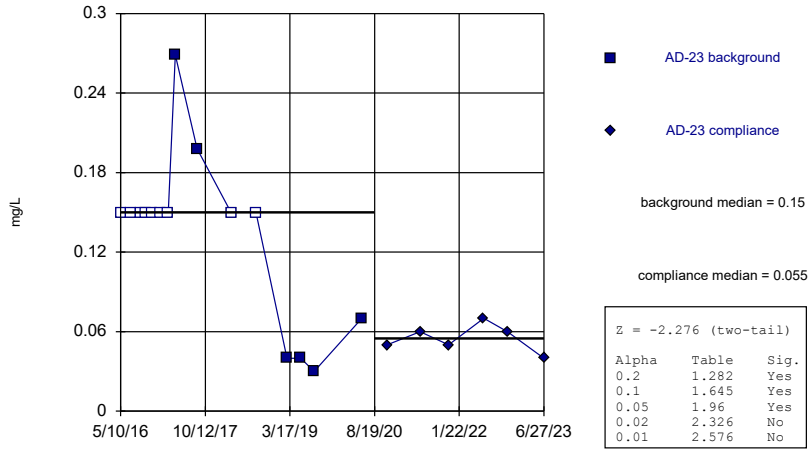
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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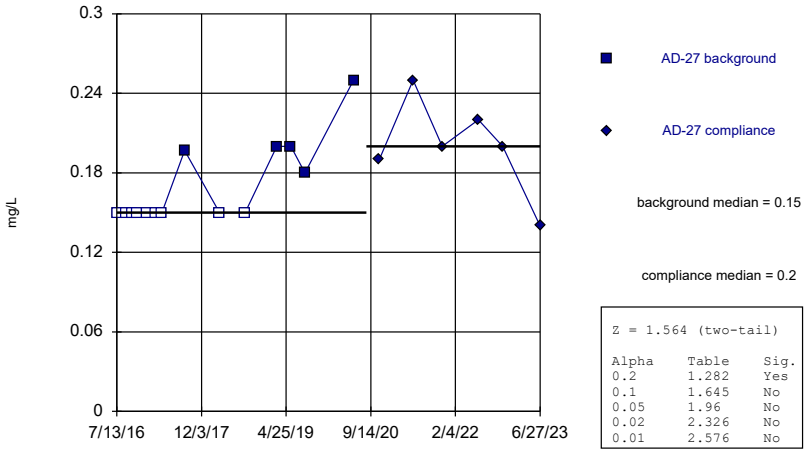
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



Z = 1.564 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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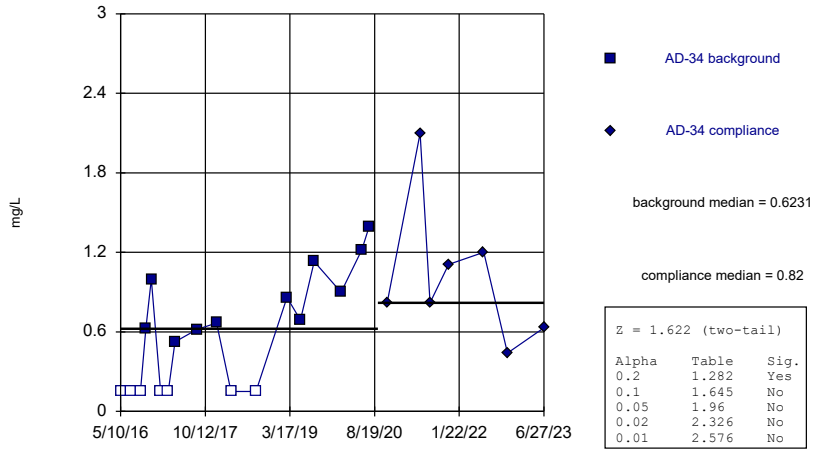
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = 1.622 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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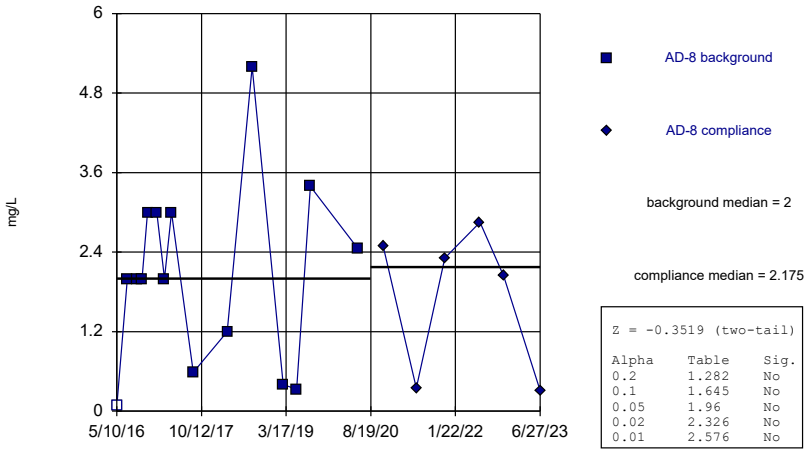
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = -0.3519 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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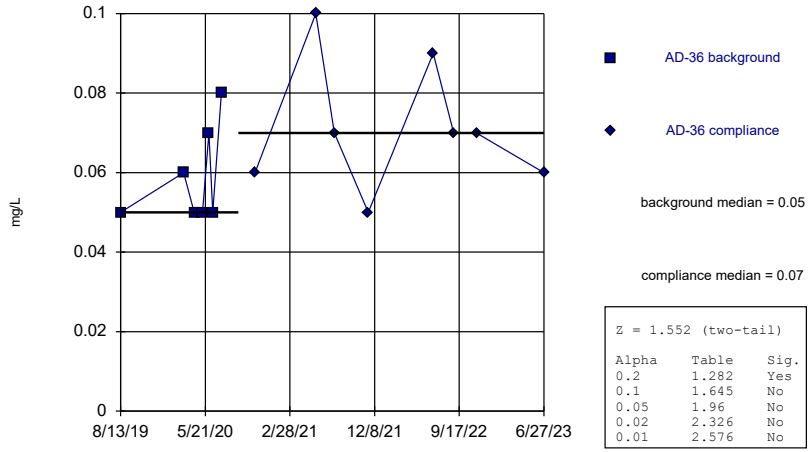
Mann-Whitney (Wilcoxon Rank Sum)

AD-36



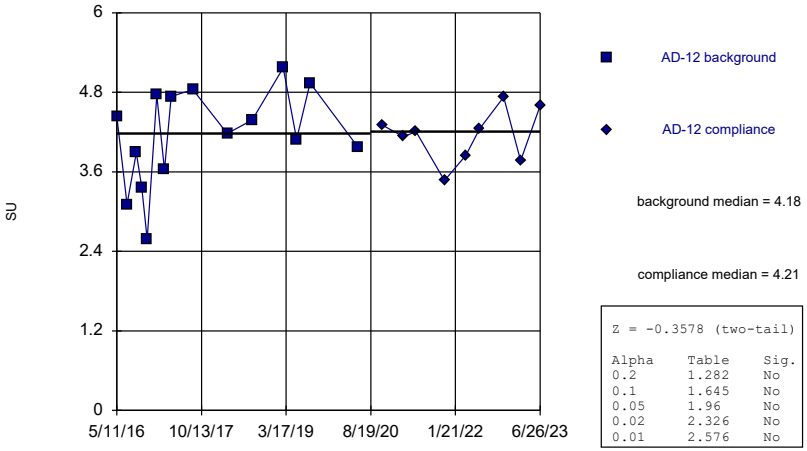
Z = 1.552 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



background median = 4.18

compliance median = 4.21

Z = -0.3578 (two-tail)

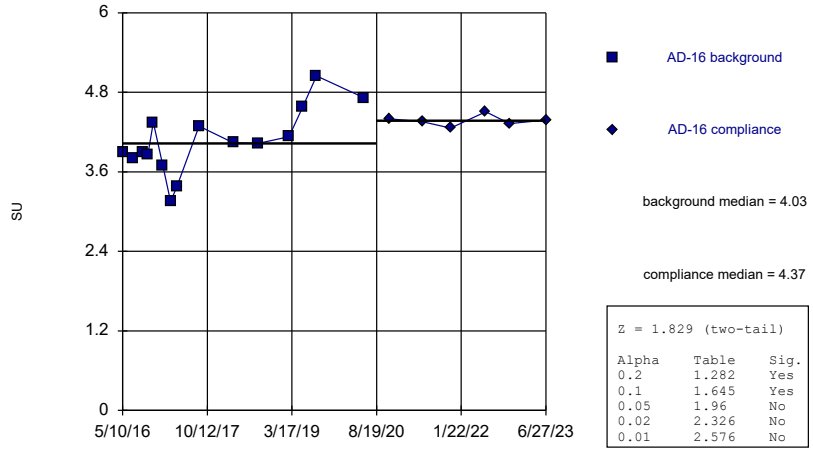
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



background median = 4.03

compliance median = 4.37

Z = 1.829 (two-tail)

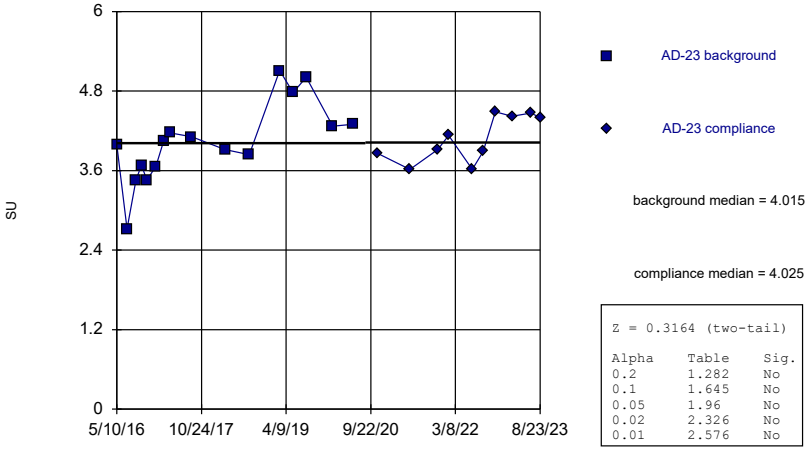
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



background median = 4.015

compliance median = 4.025

Z = 0.3164 (two-tail)

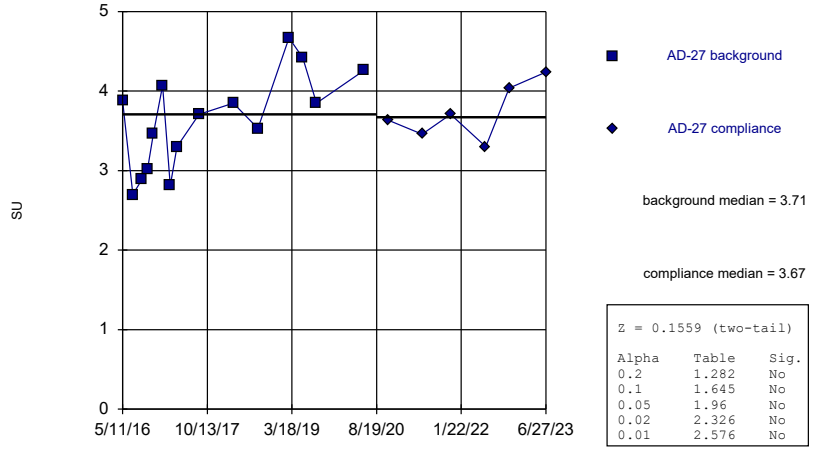
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



background median = 3.71

compliance median = 3.67

Z = 0.1559 (two-tail)

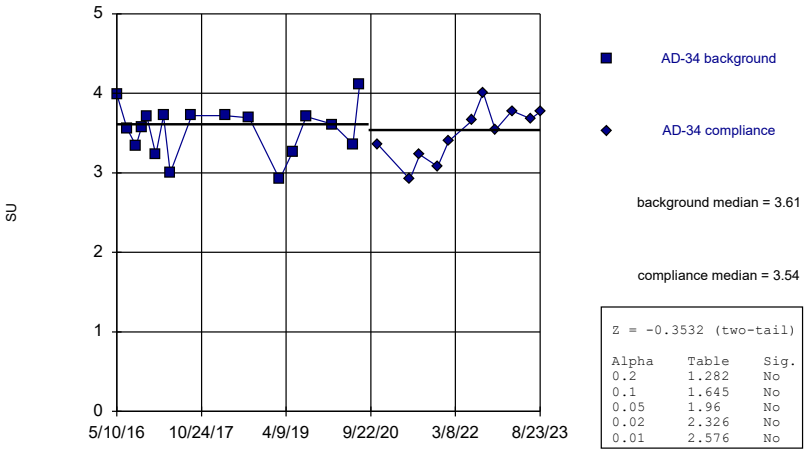
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = -0.3532 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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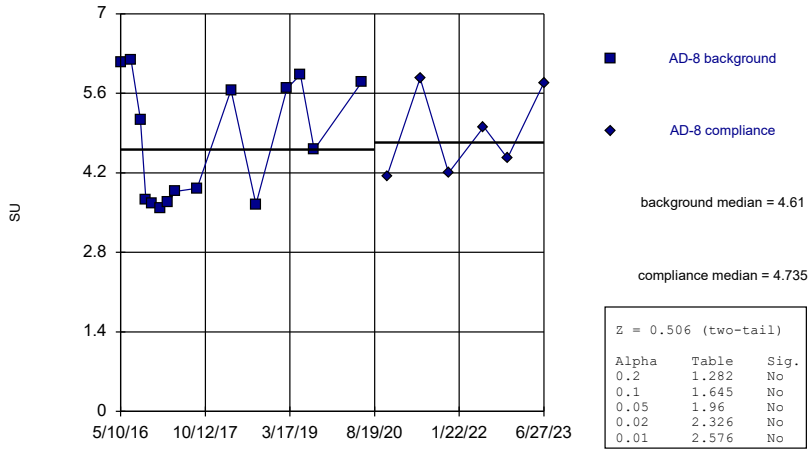
Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = 0.506 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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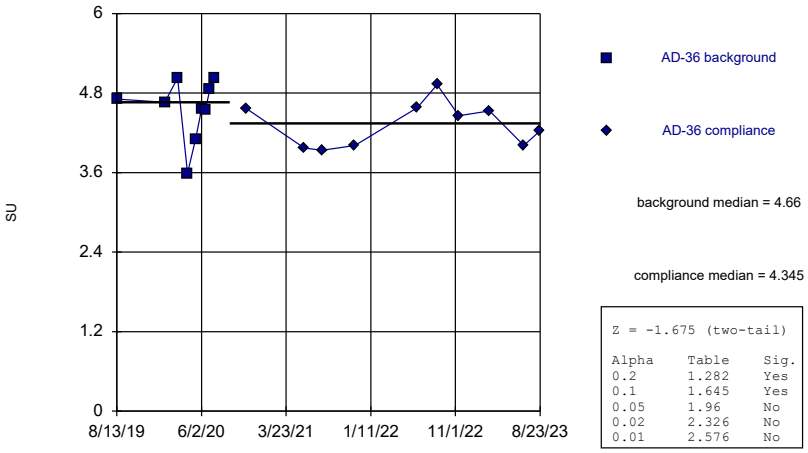
Mann-Whitney (Wilcoxon Rank Sum)

AD-36



Z = -1.675 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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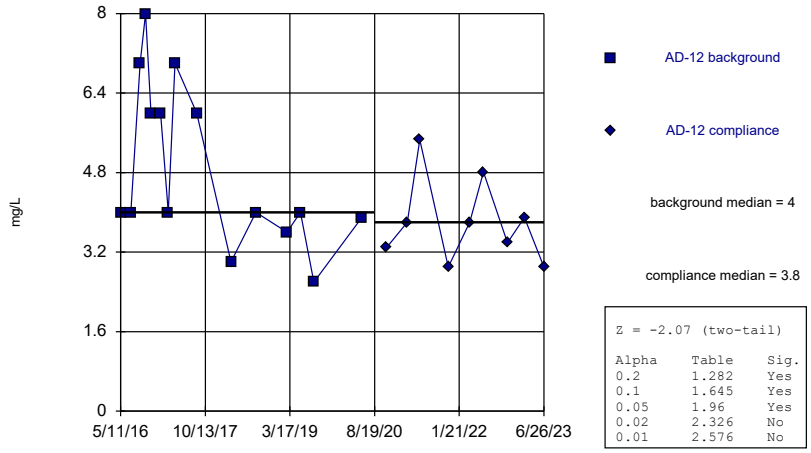
Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



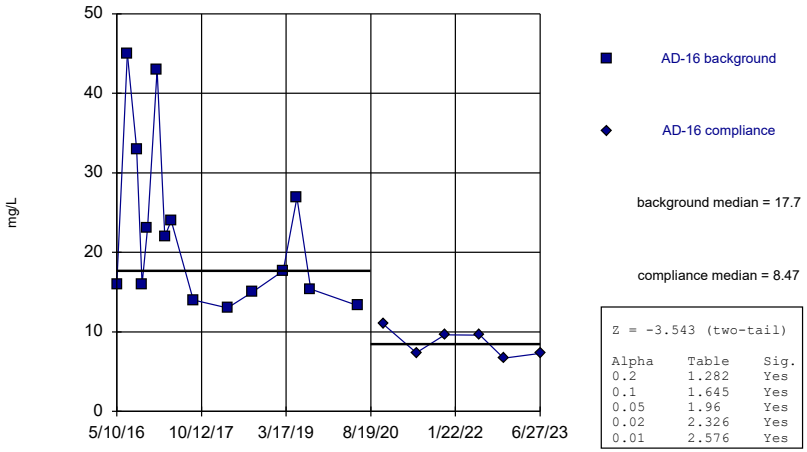
Z = -2.07 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Z = -3.543 (two-tail)

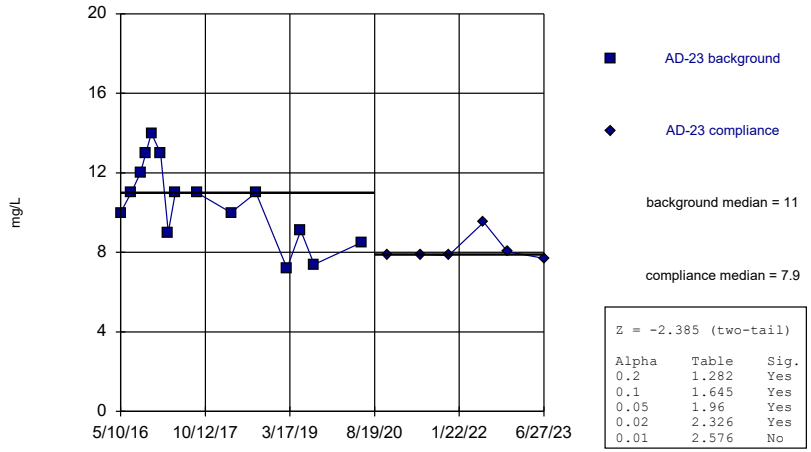
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Z = -2.385 (two-tail)

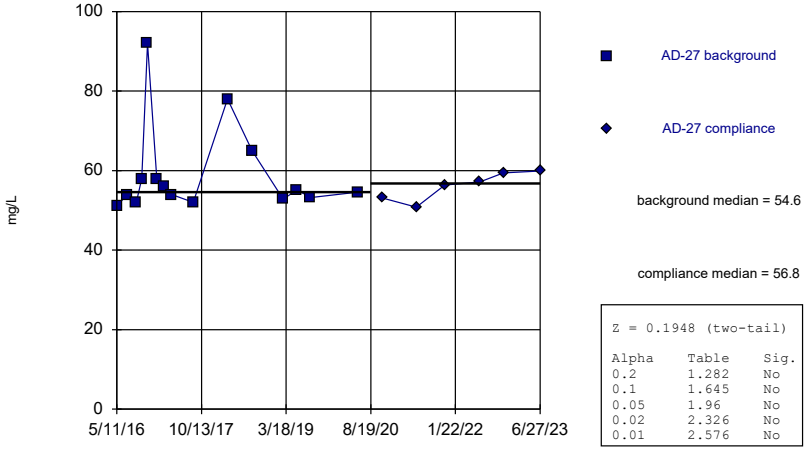
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



Z = 0.1948 (two-tail)

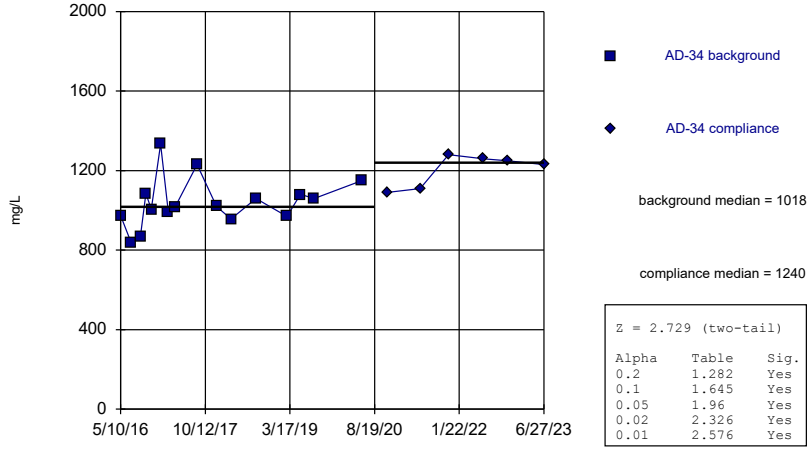
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = 2.729 (two-tail)

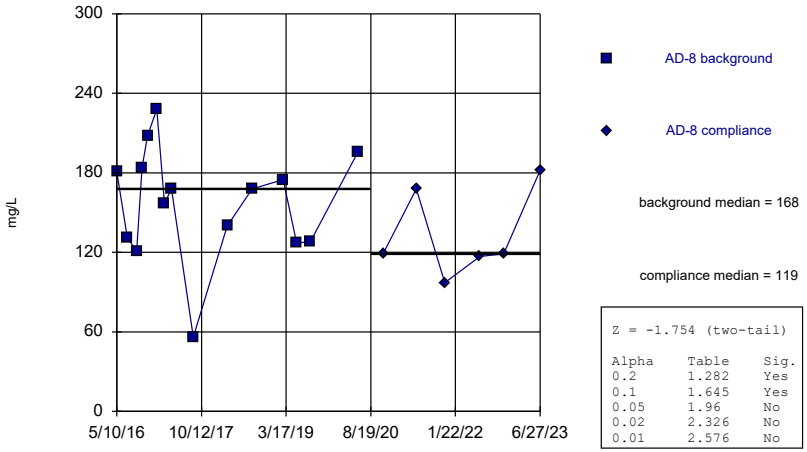
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = -1.754 (two-tail)

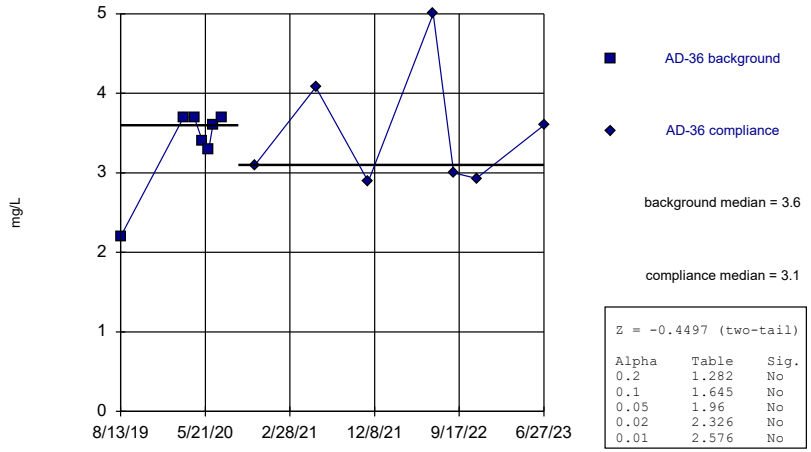
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-36



Z = -0.4497 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

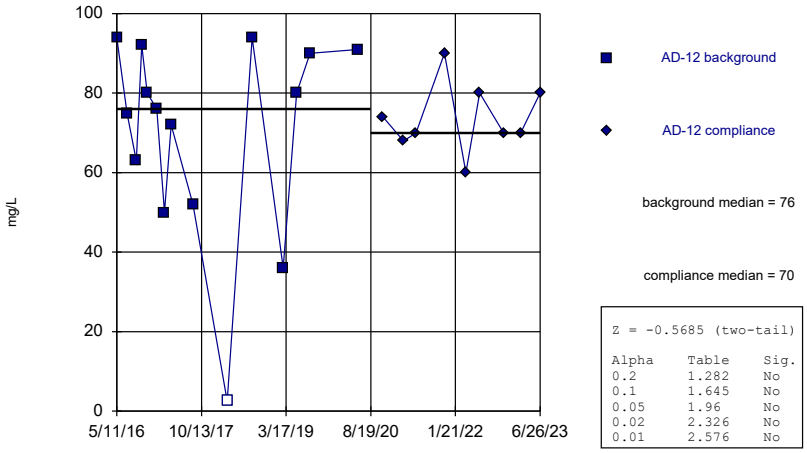
Constituent: Sulfate, total Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -0.5685 (two-tail)

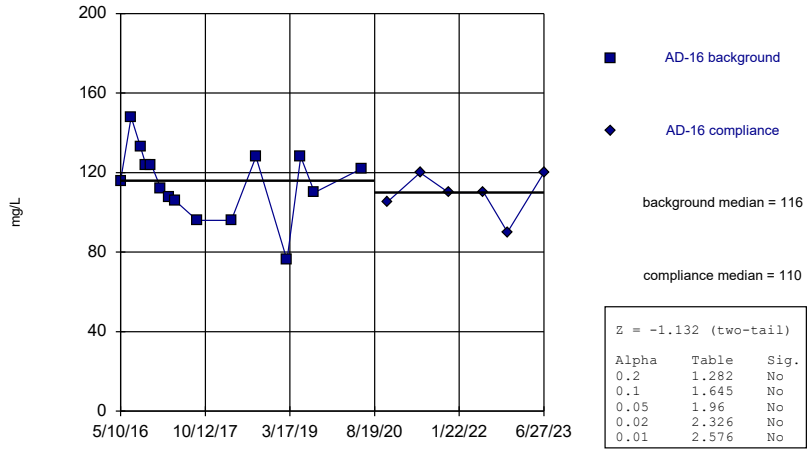
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-16 (bg)



Z = -1.132 (two-tail)

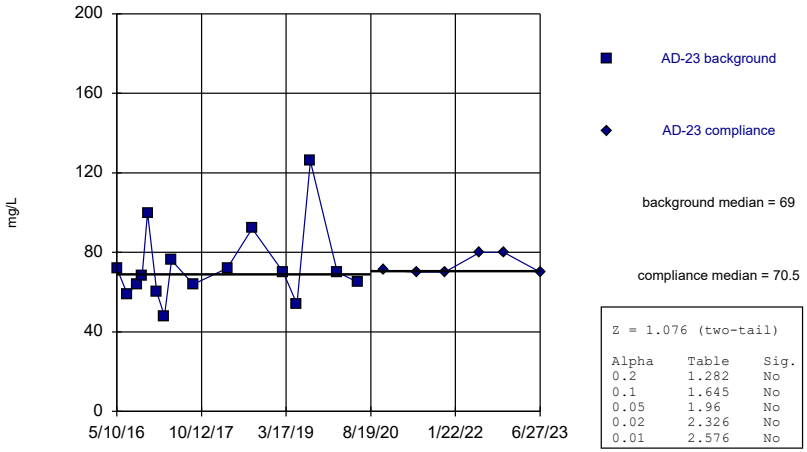
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-23



Z = 1.076 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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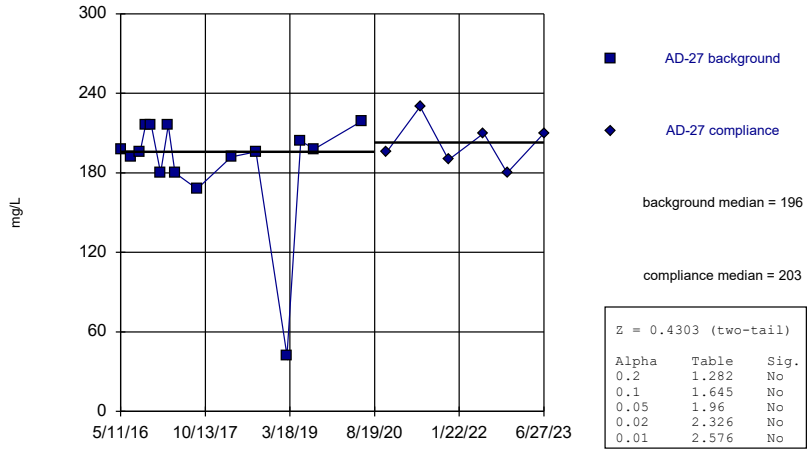
Mann-Whitney (Wilcoxon Rank Sum)

AD-27 (bg)



Z = 0.4303 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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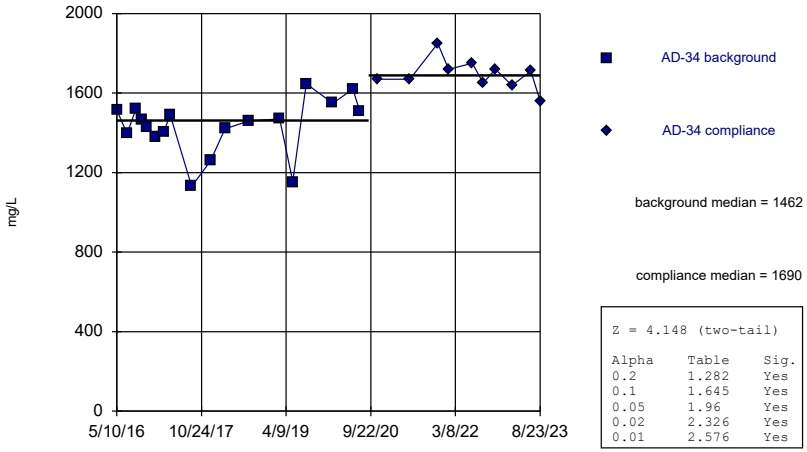
Mann-Whitney (Wilcoxon Rank Sum)

AD-34



Z = 4.148 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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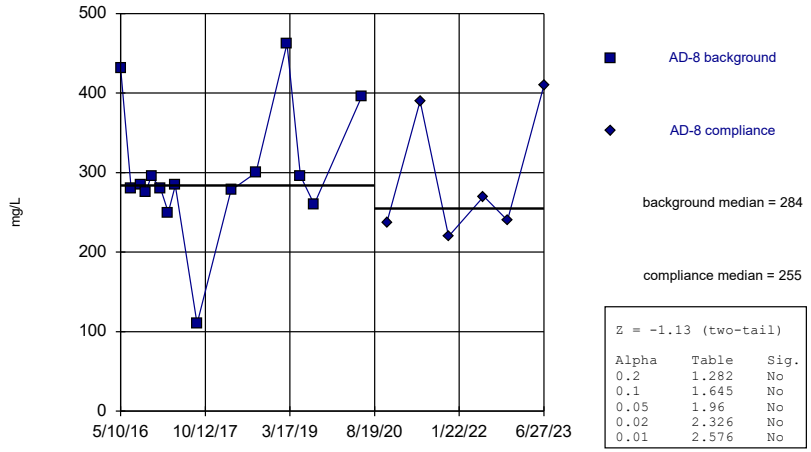
Mann-Whitney (Wilcoxon Rank Sum)

AD-8 (bg)



Z = -1.13 (two-tail)

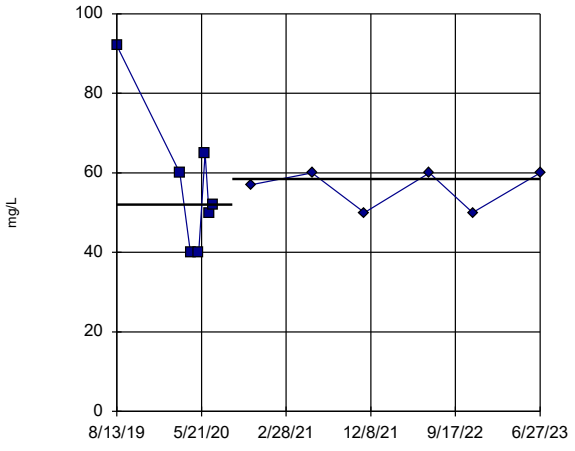
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Mann-Whitney (Wilcoxon Rank Sum)

AD-36



AD-36 background

AD-36 compliance

background median = 52

compliance median = 58.5

Z = 0.1459 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 3:51 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Intrawell Prediction Limits - All Results

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill Printed 12/15/2023, 4:04 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	AD-12	0.04901	n/a	n/a	1 future	n/a	24	0.02794	0.01142	8.333	None	No	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-16	0.05019	n/a	n/a	1 future	n/a	20	0.1649	0.03123	15	None	sqrt(x)	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-23	0.06117	n/a	n/a	1 future	n/a	26	0.03241	0.01574	11.54	None	No	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-27	0.03999	n/a	n/a	1 future	n/a	20	0.02924	0.00568	0	None	No	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-34	0.1079	n/a	n/a	1 future	n/a	20	0.07675	0.01644	0	None	No	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-8	1.325	n/a	n/a	1 future	n/a	21	0.8918	0.2304	0	None	No	0.002505	Param Intra 1 of 2
Boron, total (mg/L)	AD-36	0.07466	n/a	n/a	1 future	n/a	13	0.06062	0.006764	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-12	0.4135	n/a	n/a	1 future	n/a	24	0.294	0.06475	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-16	1.561	n/a	n/a	1 future	n/a	14	-0.03379	0.2348	0	None	ln(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-23	0.5032	n/a	n/a	1 future	n/a	22	0.6678	0.06826	0	None	x^(1/3)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-27	4.957	n/a	n/a	1 future	n/a	21	2.011	0.1148	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-34	46.13	n/a	n/a	1 future	n/a	24	39.95	3.346	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-8	109	n/a	n/a	1 future	n/a	21	n/a	n/a	0	n/a	n/a	0.003999	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-36	1.22	n/a	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Chloride, total (mg/L)	AD-12	8.775	n/a	n/a	1 future	n/a	24	6.41	1.281	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-16	27.54	n/a	n/a	1 future	n/a	8	17.1	4.248	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-23	8.915	n/a	n/a	1 future	n/a	21	6.254	1.415	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-27	14.49	n/a	n/a	1 future	n/a	14	11.44	1.494	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-34	8.974	n/a	n/a	1 future	n/a	22	1.95	0.06837	0	None	x^(1/3)	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-8	20.55	n/a	n/a	1 future	n/a	21	11.76	4.671	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-36	11.8	n/a	n/a	1 future	n/a	17	n/a	n/a	0	n/a	n/a	0.005914	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	AD-12	0.1738	n/a	n/a	1 future	n/a	24	0.2926	0.06732	37.5	Kaplan-Meier	sqrt(x)	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-16	0.15	n/a	n/a	1 future	n/a	21	n/a	n/a	52.38	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	AD-23	0.1559	n/a	n/a	1 future	n/a	21	0.2281	0.08869	42.86	Kaplan-Meier	sqrt(x)	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-27	0.25	n/a	n/a	1 future	n/a	20	n/a	n/a	45	n/a	n/a	0.004291	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	AD-34	1.583	n/a	n/a	1 future	n/a	25	0.694	0.4846	28	Kaplan-Meier	No	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-8	4.392	n/a	n/a	1 future	n/a	21	1.952	1.297	4.762	None	No	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-36	0.098	n/a	n/a	1 future	n/a	15	0.254	0.02944	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
pH, field (SU)	AD-12	5.283	3	n/a	1 future	n/a	24	4.142	0.6185	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-16	4.976	3.32	n/a	1 future	n/a	21	4.148	0.4401	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-23	4.991	3.112	n/a	1 future	n/a	26	4.052	0.5142	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-27	4.664	2.65	n/a	1 future	n/a	21	3.657	0.5355	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-34	4.102	2.946	n/a	1 future	n/a	28	3.524	0.3187	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-8	6.745	3.102	n/a	1 future	n/a	21	2.179	0.2223	0	None	sqrt(x)	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-36	5.222	3.654	n/a	1 future	n/a	19	4.438	0.4102	0	None	No	0.001253	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-12	7.318	n/a	n/a	1 future	n/a	24	2.09	0.3335	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-16	17.62	n/a	n/a	1 future	n/a	8	10.03	3.085	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-23	13.64	n/a	n/a	1 future	n/a	21	9.814	2.035	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-27	92	n/a	n/a	1 future	n/a	21	n/a	n/a	0	n/a	n/a	0.003999	NP Intra (normality) 1 of 2
Sulfate, total (mg/L)	AD-34	1336	n/a	n/a	1 future	n/a	22	1085	134.5	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-8	227.7	n/a	n/a	1 future	n/a	21	151	40.79	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-36	4.774	n/a	n/a	1 future	n/a	14	3.443	0.6521	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-12	99.22	n/a	n/a	1 future	n/a	24	5487	2361	4.167	None	x^2	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-16	143.6	n/a	n/a	1 future	n/a	21	113.4	16.04	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-23	103.5	n/a	n/a	1 future	n/a	22	8.485	0.9048	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-27	231.9	n/a	n/a	1 future	n/a	21	7683576	2541812	0	None	x^3	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-34	1842	n/a	n/a	1 future	n/a	28	1527	173.6	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-8	449.6	n/a	n/a	1 future	n/a	21	297.7	80.75	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-36	84.86	n/a	n/a	1 future	n/a	13	7.482	0.8332	0	None	sqrt(x)	0.002505	Param Intra 1 of 2

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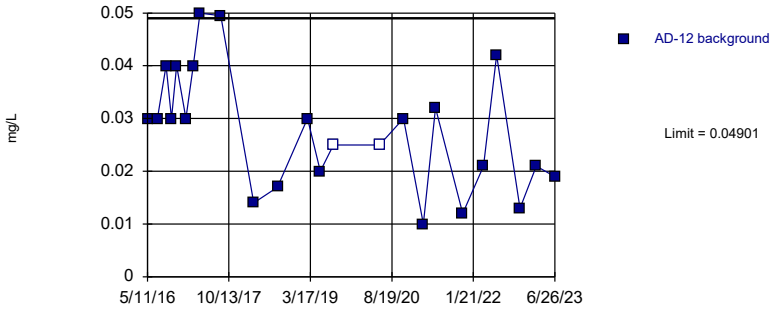
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-12 (bg)



Background Data Summary: Mean=0.02794, Std. Dev.=0.01142, n=24, 8.333% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9519, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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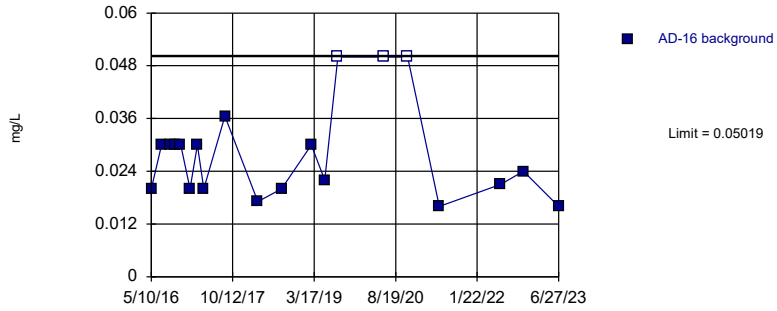
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-16 (bg)



Background Data Summary (based on square root transformation): Mean=0.1649, Std. Dev.=0.03123, n=20, 15% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8766, critical = 0.868. Kappa = 1.892 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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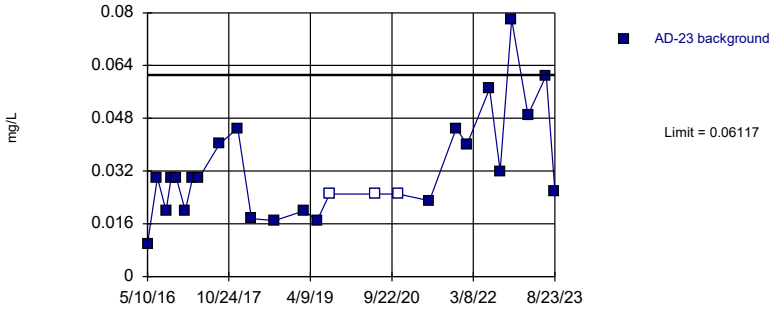
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary: Mean=0.03241, Std. Dev.=0.01574, n=26, 11.54% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8974, critical = 0.891. Kappa = 1.827 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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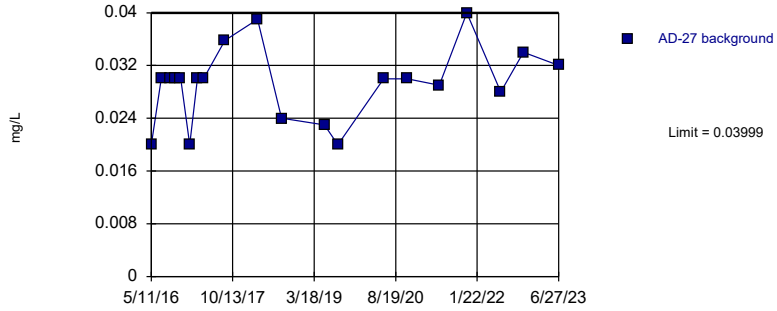
Prediction Limit

Intrawell Parametric, AD-27 (bg)

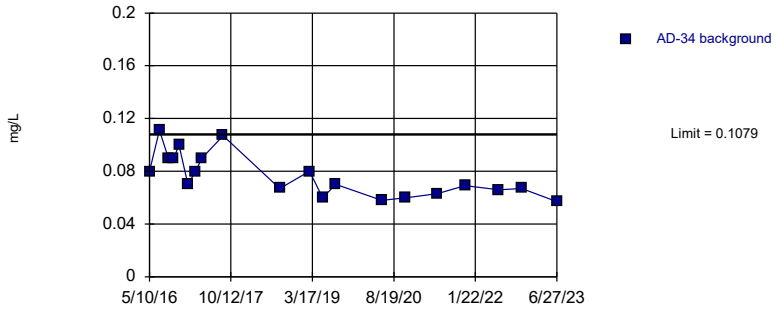


Background Data Summary: Mean=0.02924, Std. Dev.=0.00568, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9109, critical = 0.868. Kappa = 1.892 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-34



Background Data Summary: Mean=0.07675, Std. Dev.=0.01644, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9076, critical = 0.868. Kappa = 1.892 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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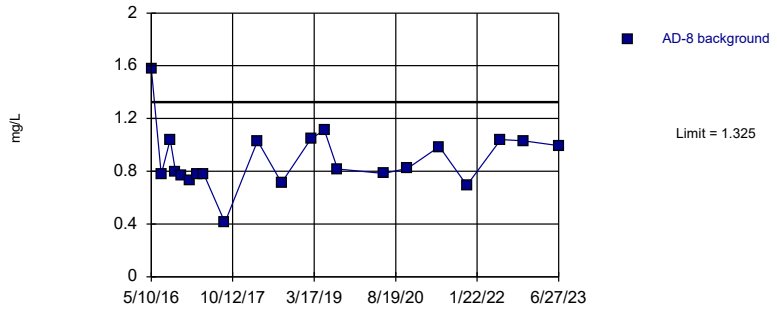
Prediction Limit

Intrawell Parametric, AD-8 (bg)



Background Data Summary: Mean=0.8918, Std. Dev.=0.2304, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8795, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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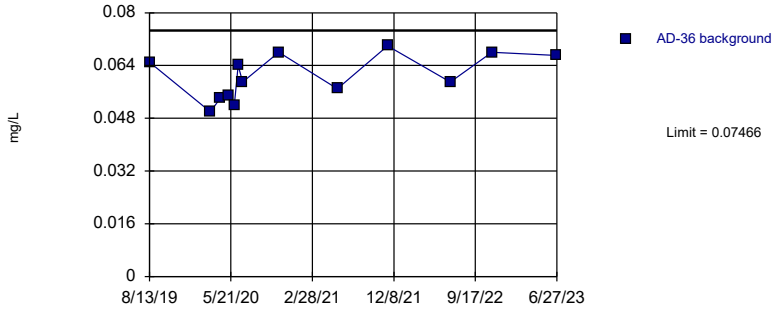
Prediction Limit

Intrawell Parametric, AD-36



Background Data Summary: Mean=0.06062, Std. Dev.=0.006764, n=13. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9312, critical = 0.866. Kappa = 2.077 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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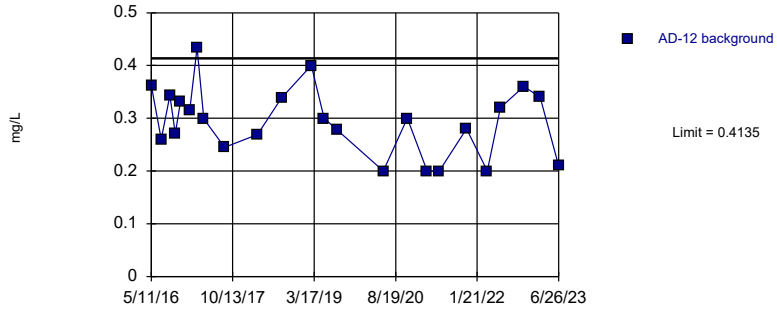
Prediction Limit

Intrawell Parametric, AD-12 (bg)



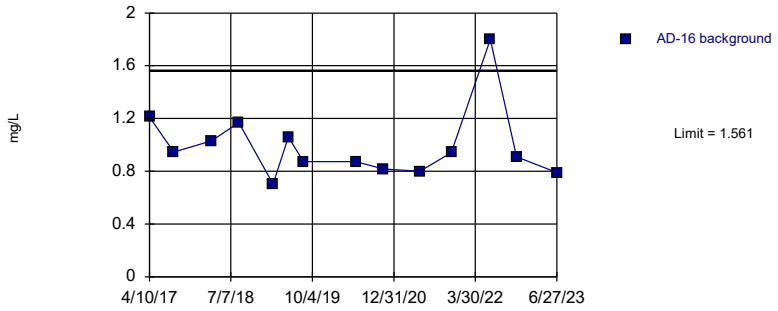
Background Data Summary: Mean=0.294, Std. Dev.=0.06475, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9552, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-16 (bg)



Background Data Summary (based on natural log transformation): Mean=-0.03379, Std. Dev.=0.2348, n=14. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.897, critical = 0.874. Kappa = 2.041 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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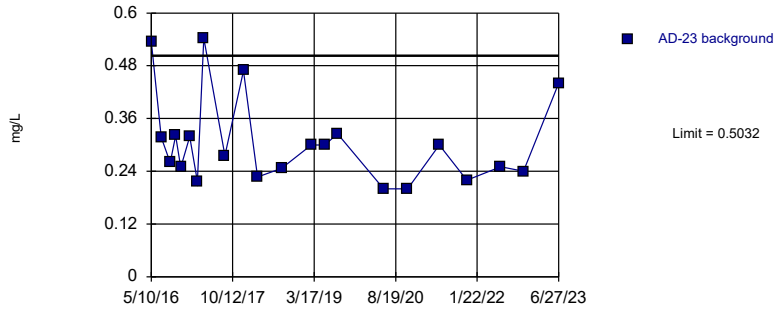
Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary (based on cube root transformation): Mean=0.6678, Std. Dev.=0.06826, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8836, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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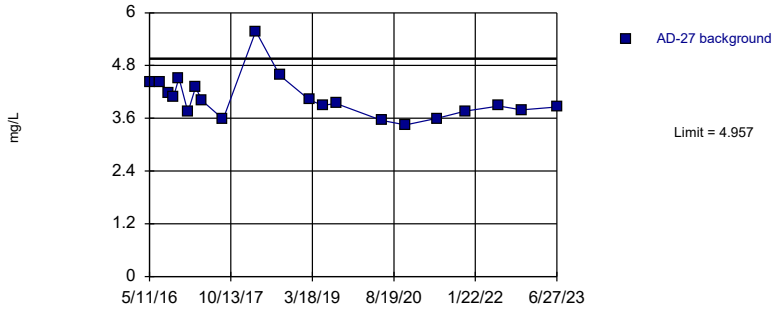
Prediction Limit

Intrawell Parametric, AD-27 (bg)



Background Data Summary (based on square root transformation): Mean=2.011, Std. Dev.=0.1148, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8962, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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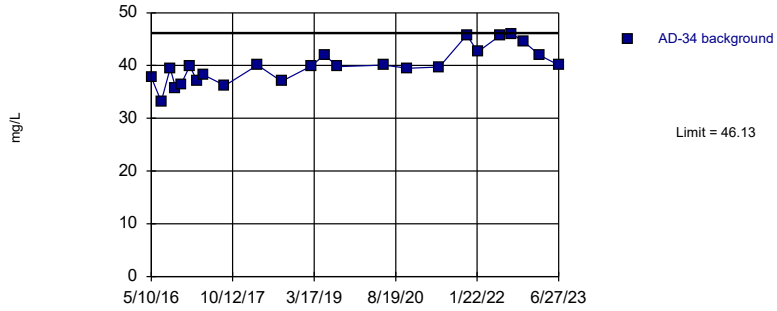
Prediction Limit

Intrawell Parametric, AD-34



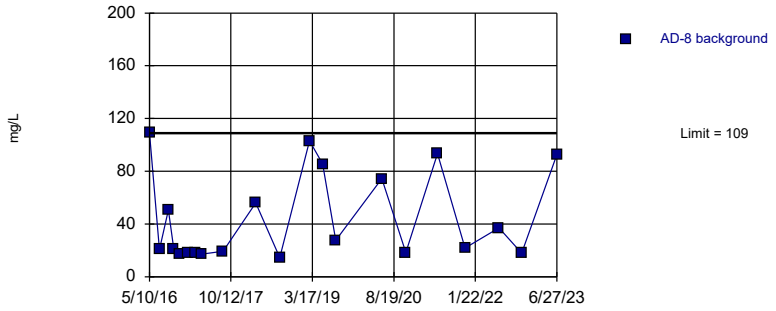
Background Data Summary: Mean=39.95, Std. Dev.=3.346, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9492, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Non-parametric, AD-8 (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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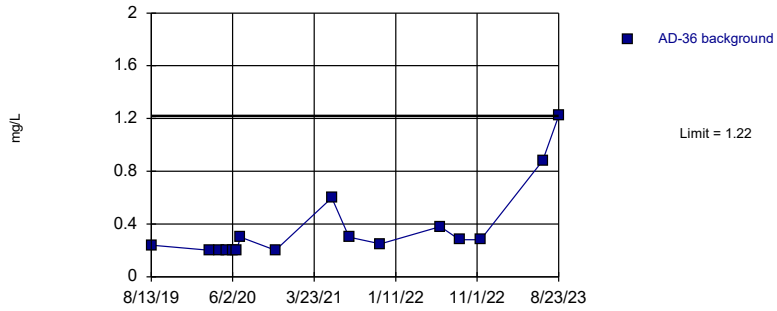
Prediction Limit

Intrawell Non-parametric, AD-36



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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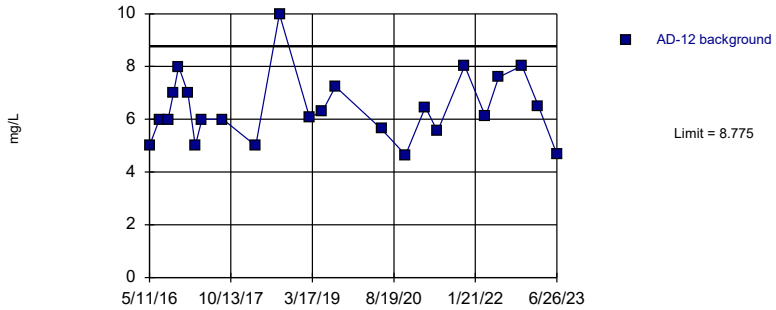
Prediction Limit

Intrawell Parametric, AD-12 (bg)



Background Data Summary: Mean=6.41, Std. Dev.=1.281, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9305, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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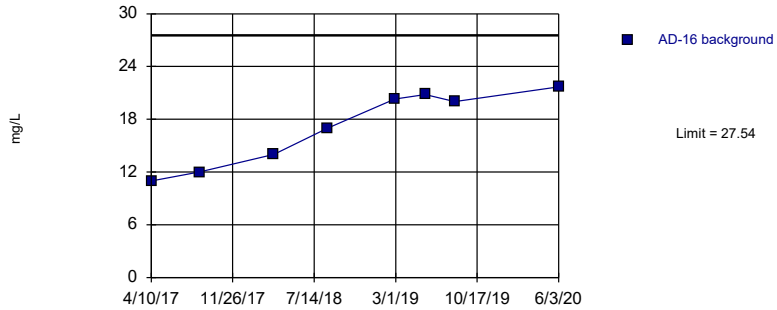
Prediction Limit

Intrawell Parametric, AD-16 (bg)



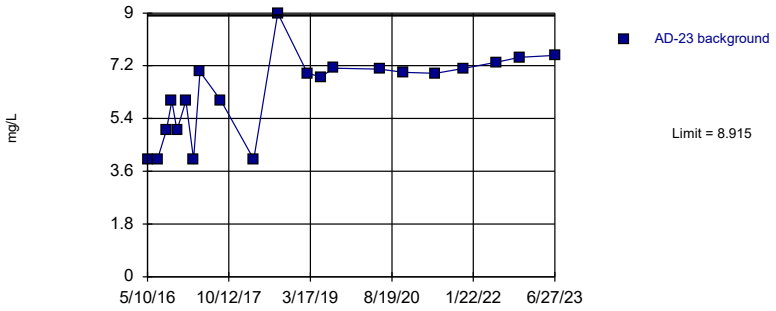
Background Data Summary: Mean=17.1, Std. Dev.=4.248, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.877, critical = 0.851. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary: Mean=6.254, Std. Dev.=1.415, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8906, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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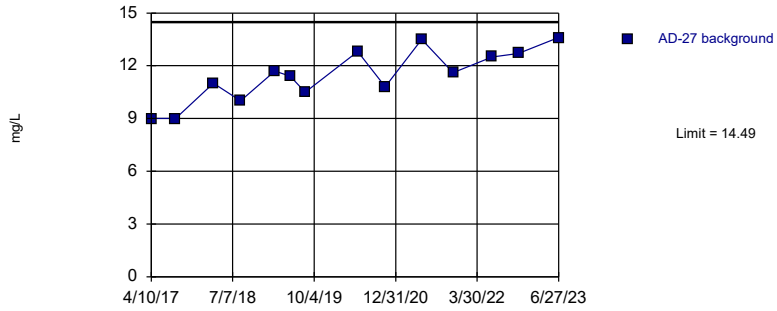
Prediction Limit

Intrawell Parametric, AD-27 (bg)



Background Data Summary: Mean=11.44, Std. Dev.=1.494, n=14. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9531, critical = 0.874. Kappa = 2.041 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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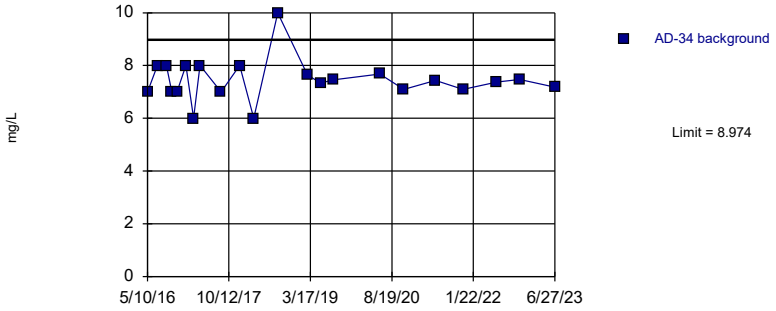
Prediction Limit

Intrawell Parametric, AD-34



Background Data Summary (based on cube root transformation): Mean=1.95, Std. Dev.=0.06837, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8781, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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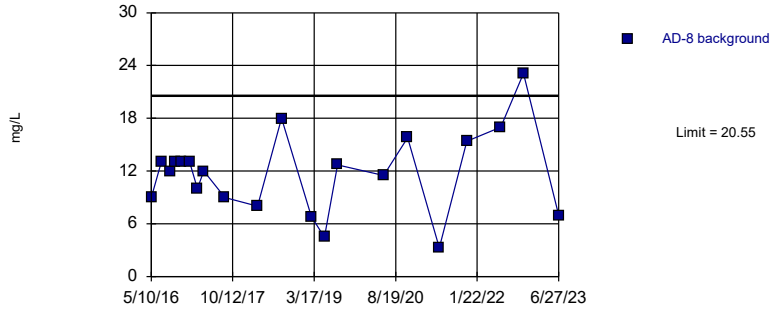
Prediction Limit

Intrawell Parametric, AD-8 (bg)



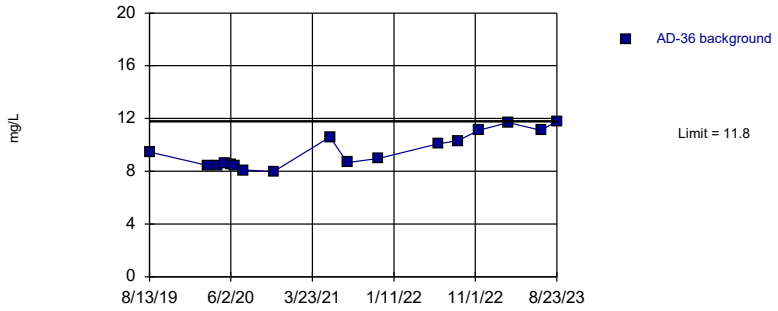
Background Data Summary: Mean=11.76, Std. Dev.=4.671, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9744, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Non-parametric, AD-36



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 17 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005914 (1 of 2). Assumes 1 future value.

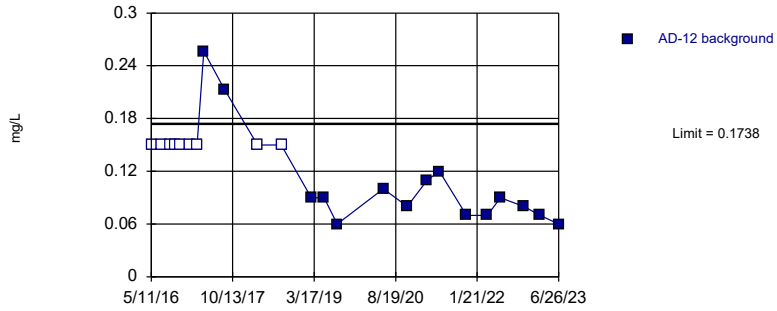
Constituent: Chloride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-12 (bg)



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.2926, Std. Dev.=0.06732, n=24, 37.5% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9088, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

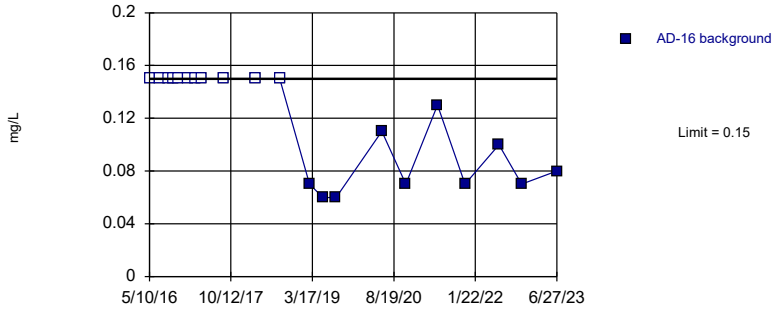
Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-16 (bg)



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 52.38% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

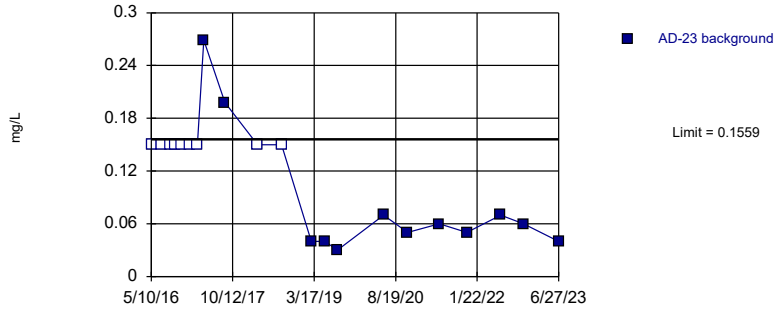
Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.2281, Std. Dev.=0.08869, n=21, 42.86% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8738, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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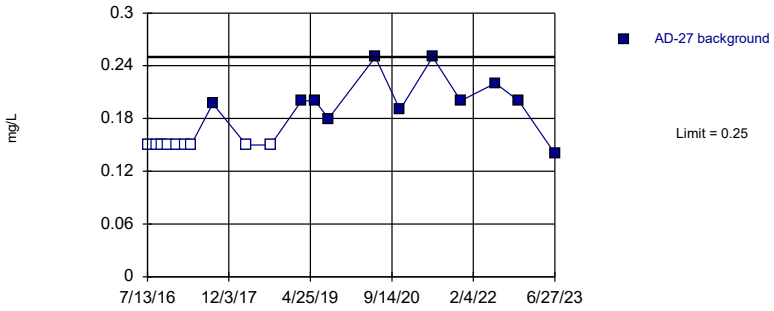
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-27 (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 20 background values. 45% NDs. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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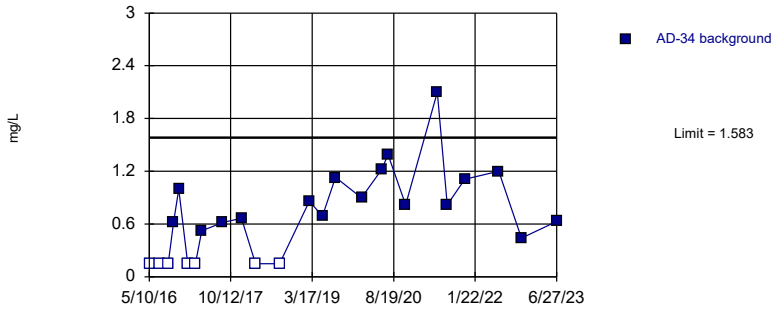
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-34



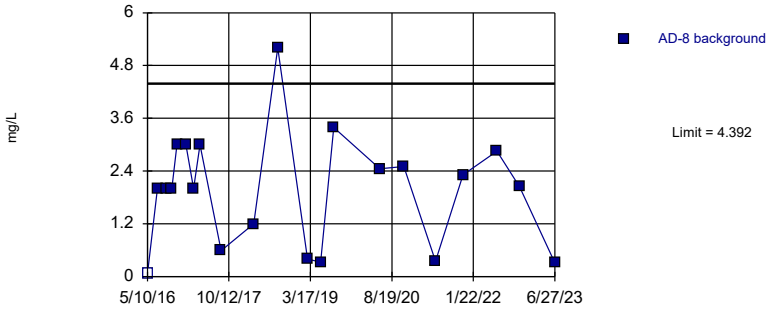
Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.694, Std. Dev.=0.4846, n=25, 28% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9067, critical = 0.888. Kappa = 1.834 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-8 (bg)



Background Data Summary: Mean=1.952, Std. Dev.=1.297, n=21, 4.762% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9229, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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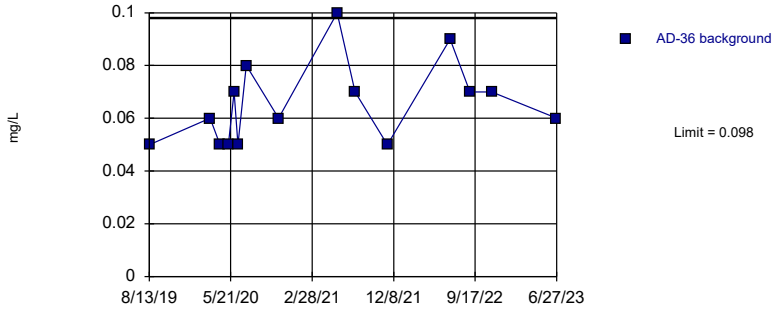
Prediction Limit

Intrawell Parametric, AD-36

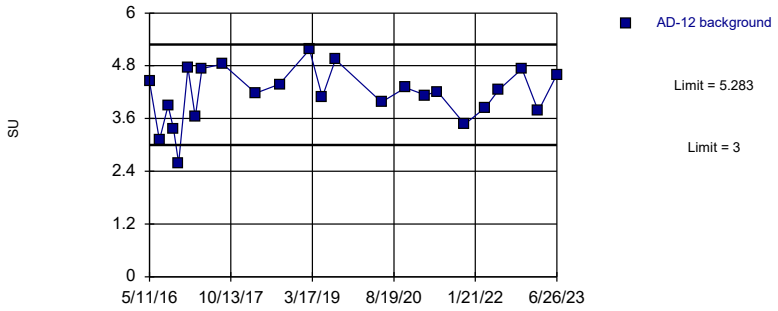


Background Data Summary (based on square root transformation): Mean=0.254, Std. Dev.=0.02944, n=15. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8838, critical = 0.881. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/15/2023 4:03 PM
Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-12 (bg)



Background Data Summary: Mean=4.142, Std. Dev.=0.6185, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9715, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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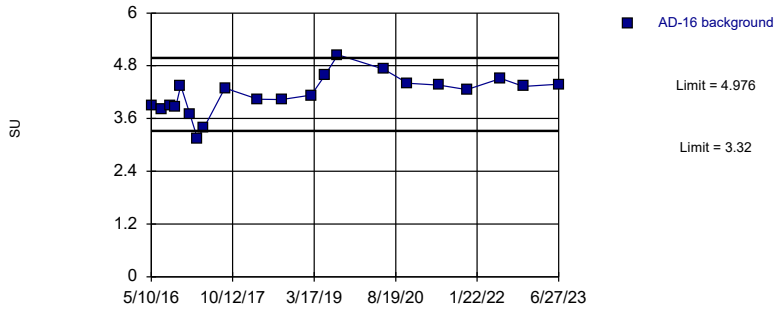
Prediction Limit

Intrawell Parametric, AD-16 (bg)



Background Data Summary: Mean=4.148, Std. Dev.=0.4401, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.976, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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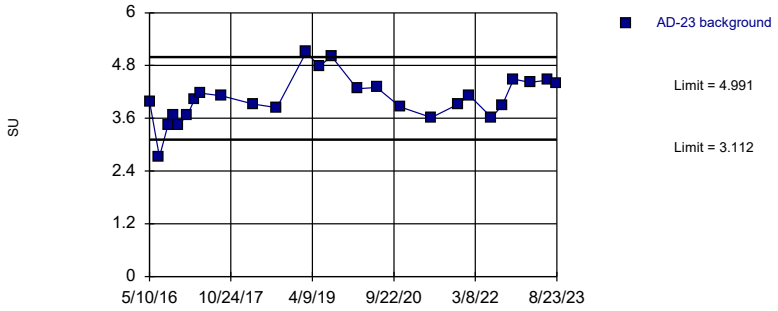
Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary: Mean=4.052, Std. Dev.=0.5142, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9735, critical = 0.891. Kappa = 1.827 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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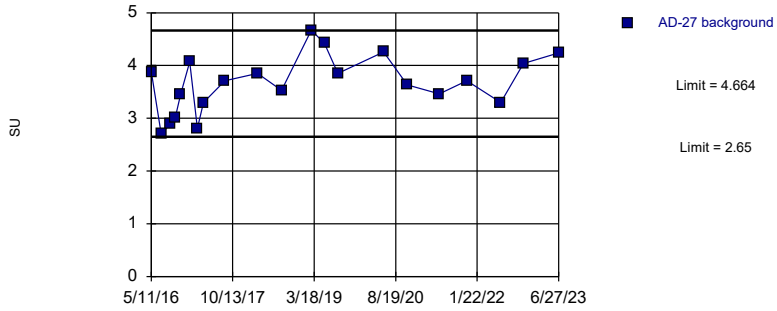
Prediction Limit

Intrawell Parametric, AD-27 (bg)



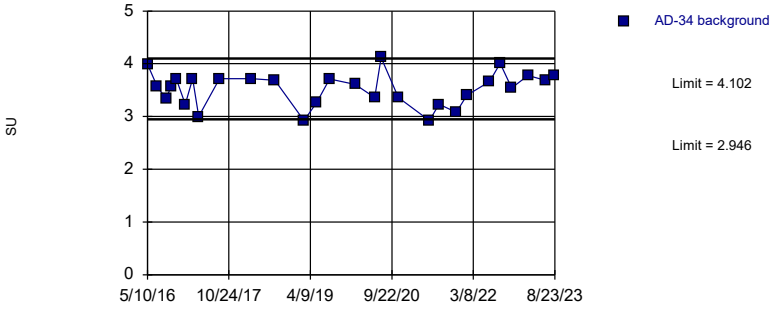
Background Data Summary: Mean=3.657, Std. Dev.=0.5355, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9815, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-34



Background Data Summary: Mean=3.524, Std. Dev.=0.3187, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9527, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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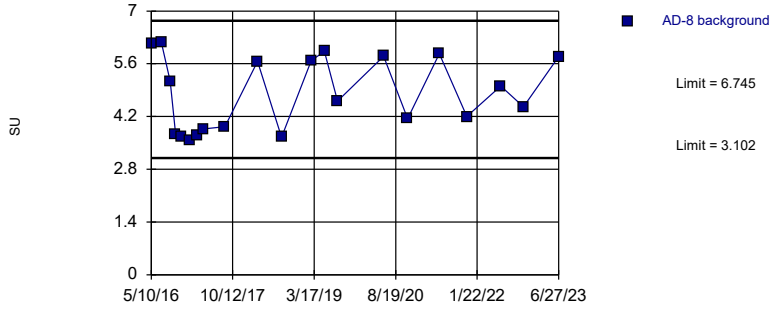
Prediction Limit

Intrawell Parametric, AD-8 (bg)



Background Data Summary (based on square root transformation): Mean=2.179, Std. Dev.=0.2223, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8741, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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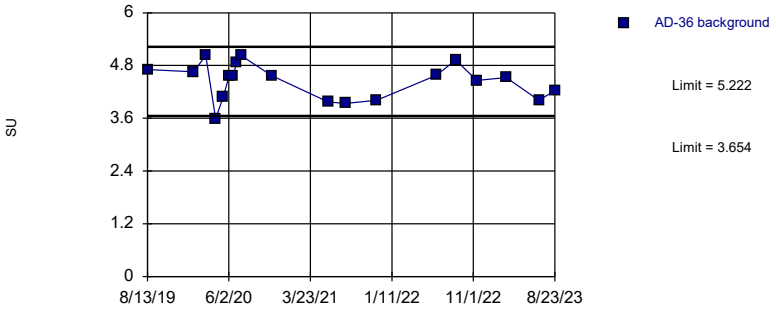
Prediction Limit

Intrawell Parametric, AD-36



Background Data Summary: Mean=4.438, Std. Dev.=0.4102, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9452, critical = 0.901. Kappa = 1.912 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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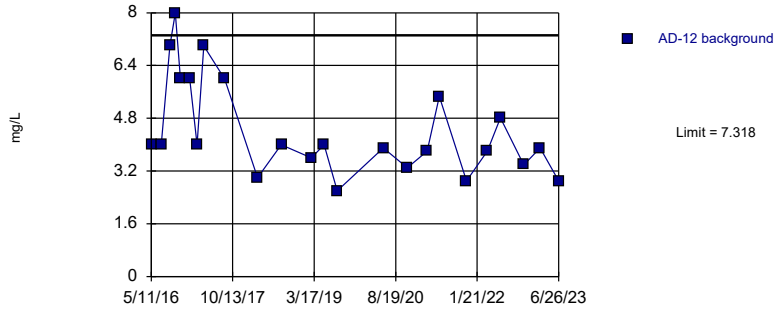
Prediction Limit

Intrawell Parametric, AD-12 (bg)



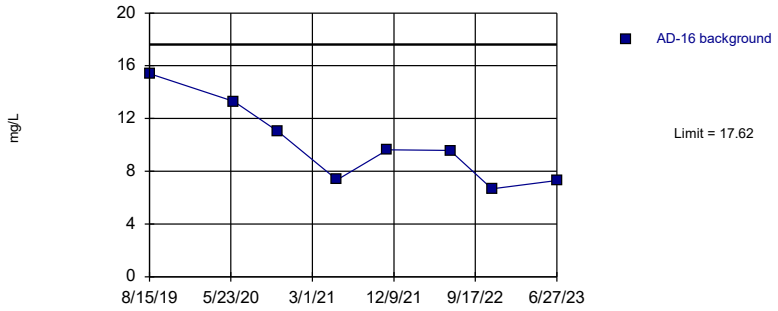
Background Data Summary (based on square root transformation): Mean=2.09, Std. Dev.=0.3335, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9084, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-16 (bg)



Background Data Summary: Mean=10.03, Std. Dev.=3.085, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9163, critical = 0.851. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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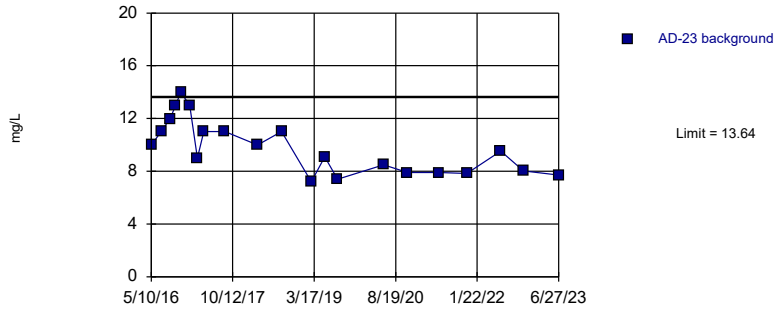
Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary: Mean=9.814, Std. Dev.=2.035, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9271, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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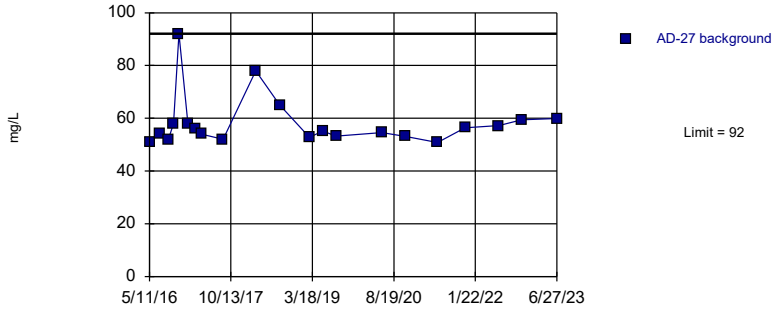
Prediction Limit

Intrawell Non-parametric, AD-27 (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

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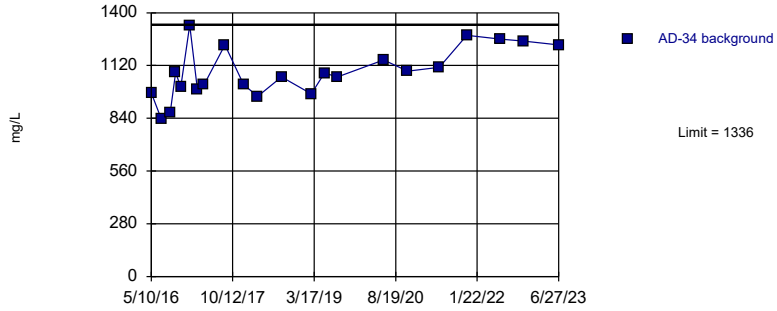
Prediction Limit

Intrawell Parametric, AD-34



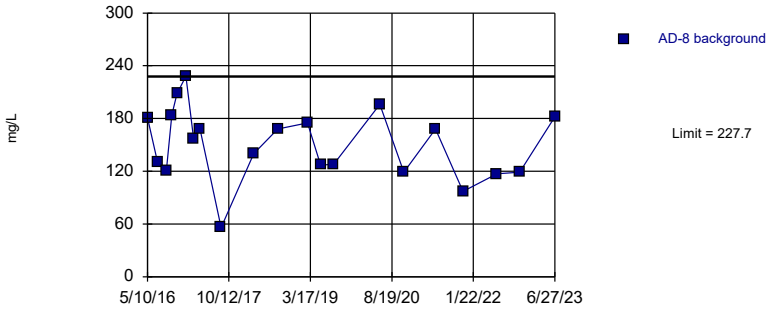
Background Data Summary: Mean=1085, Std. Dev.=134.5, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9639, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-8 (bg)



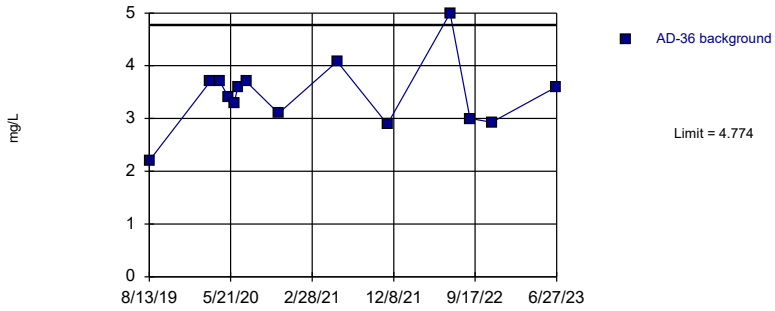
Background Data Summary: Mean=151, Std. Dev.=40.79, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9711, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-36



Background Data Summary: Mean=3.443, Std. Dev.=0.6521, n=14. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9418, critical = 0.874. Kappa = 2.041 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

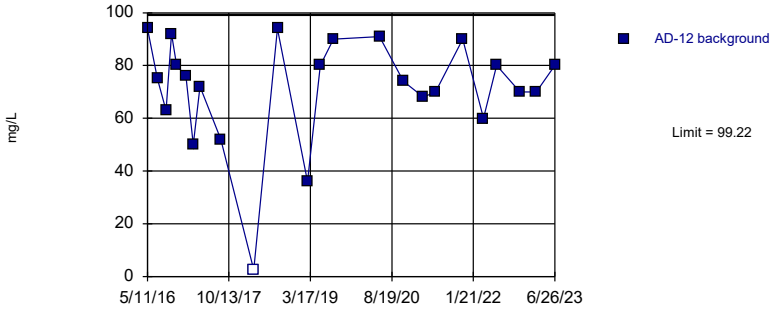
Constituent: Sulfate, total Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-12 (bg)



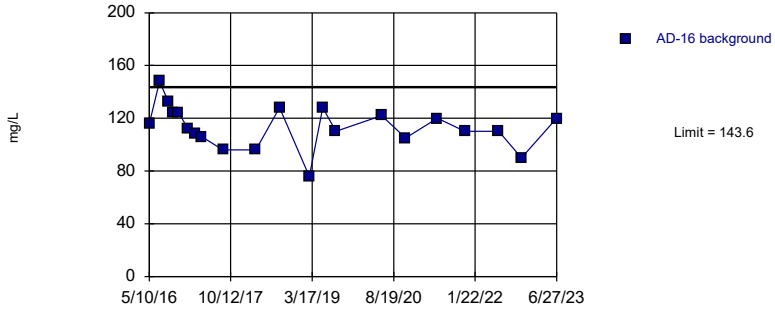
Background Data Summary (based on square transformation): Mean=5487, Std. Dev.=2361, n=24, 4.167% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9519, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-16 (bg)



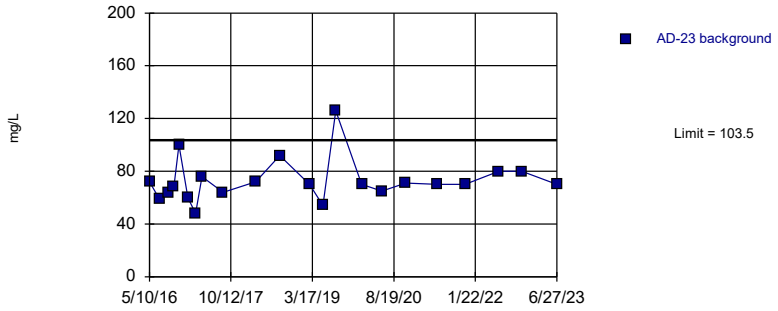
Background Data Summary: Mean=113.4, Std. Dev.=16.04, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9799, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-23



Background Data Summary (based on square root transformation): Mean=8.485, Std. Dev.=0.9048, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8843, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

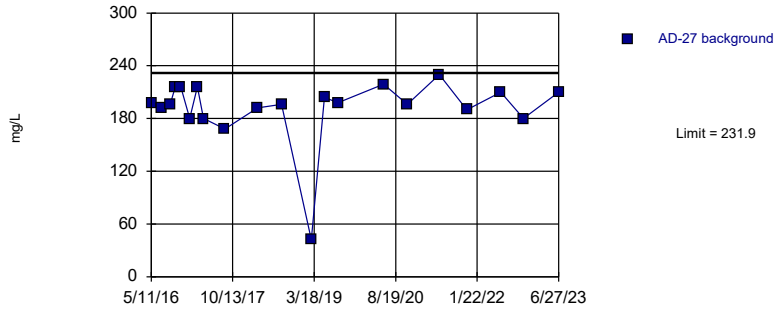
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Prediction Limit

Intrawell Parametric, AD-27 (bg)



Background Data Summary (based on cube transformation): Mean=7683576, Std. Dev.=2541812, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9174, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

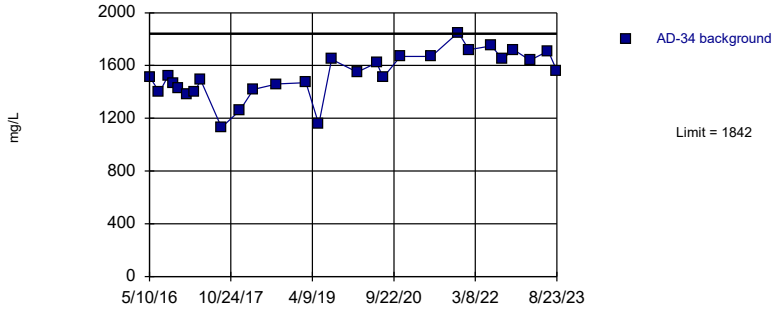
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Prediction Limit

Intrawell Parametric, AD-34



Background Data Summary: Mean=1527, Std. Dev.=173.6, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9629, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

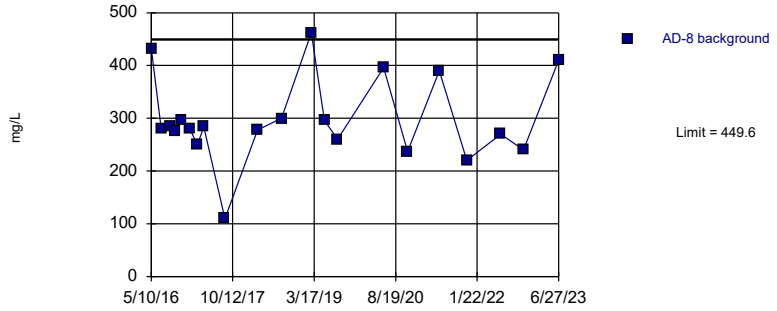
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Sanitas™ v.10.0.15 Software licensed to . UG

Prediction Limit

Intrawell Parametric, AD-8 (bg)



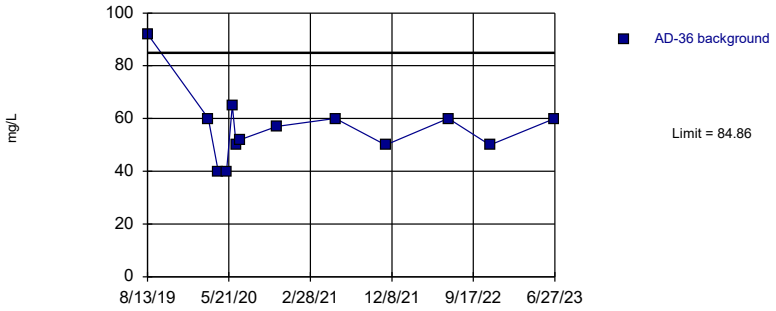
Background Data Summary: Mean=297.7, Std. Dev.=80.75, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9044, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

Prediction Limit

Intrawell Parametric, AD-36



Background Data Summary (based on square root transformation): Mean=7.482, Std. Dev.=0.8332, n=13. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8814, critical = 0.866. Kappa = 2.077 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/15/2023 4:03 PM

Pirkey Landfill Client: Geosyntec Data: Pirkey Landfill

APPENDIX 3- Alternate Source Demonstrations

Alternate source demonstrations are included in this appendix. Alternate sources are sources or reasons that explain that statistically significant increases over background or statistically significant levels above the groundwater protection standard are not attributable to the CCR unit.

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ALTERNATIVE SOURCE DEMONSTRATION REPORT TEXAS STATE CCR RULE

H.W. Pirkey Power Plant Landfill

Registration No. CCR 104

Hallsville, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 West Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project CHA8495B

September 2023

Geosyntec consultants

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ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	alternative source demonstration
CCR	coal combustion residuals
EPRI	Electric Power Research Institute
HDPE	high-density polyethylene
LPL	lower prediction limit
mg/L	milligrams per liter
SSI	statistically significant increase
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
UPL	upper prediction limit

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address statistically significant increases (SSIs) for boron and chloride in the groundwater monitoring network at the H.W. Pirkey Plant Landfill (Landfill) in Hallsville, Texas, following the second semiannual detection monitoring event of 2022. The H.W. Pirkey Plant has four coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR104, including the Landfill (**Figure 1**). The western side of the Landfill overlies a former lignite mining area, as shown on **Figure 2**.

Background groundwater concentrations for the Landfill were initially calculated in January 2018 with data from at least eight monitoring events (Geosyntec 2018). Upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH.

An ASD was certified on January 7, 2020. Because of the presence of lignite mine spoils within the screened interval at downgradient well AD-34, this ASD resulted in a switch from interwell tests to intrawell tests for evaluation of pH, sulfate, and total dissolved solids prediction limits (Geosyntec 2020). The interwell and intrawell prediction limits were updated once sufficient data could be incorporated into the background data set (Geosyntec 2021). Prediction limits were calculated based on a one-of-two retesting procedure to maintain an appropriate site-wide false positive rate. With this procedure, an SSI is concluded only if both samples in a series of two exceed the UPL or, in the case of pH, are below the LPL.

In November 2022, a semiannual detection monitoring event was conducted at the Landfill in accordance with Title 30, §352.941(a) of the Texas Administrative Code (TAC), and the results were compared to the calculated prediction limits. Where initial exceedances were identified, verification resampling was completed in February 2023. Following verification resampling, an SSI for boron was identified at well AD-23 by intrawell analysis and an SSI for chloride was identified at well AD-36 by intrawell analysis. A summary of the detection monitoring analytical results for the downgradient compliance wells and the calculated prediction limits to which they were compared is provided in **Table 1**.

1.1 CCR Rule Requirements

TCEQ regulations regarding detection monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSI is identified:

> In making a demonstration under this section, the owner or operator must . . . within 90 days of making a determination of an SSI over the background value for any Appendix III constituent adopted by reference in §352.1421 of this title, submit a report prepared and certified in accordance with §352.4 of this title (relating to Engineering and Geoscientific Information), to the executive director, and any local pollution agency with jurisdiction that has requested to be notified, demonstrating that a source other than a coal combustion residuals unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. (30 TAC §352.941(c)(2)).

Pursuant to 30 TAC §352.941(c)(2), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report on behalf of American Electric Power (AEP) to document that the SSIs identified for boron and chloride in the groundwater monitoring network for the Landfill are from a source other than the Landfill.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which the identified SSIs could be attributed. Alternative sources were categorized into the following five types, based on methods provided by the Electric Power Research Institute (EPRI 2017):

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to show that the SSIs identified for boron and chloride were based on a Type IV cause and Type V cause, respectively, and not by a release from the Pirkey Landfill.

2. SUMMARY OF SITE CONDITIONS

The Landfill design and construction, regional geology and site hydrogeology, and groundwater monitoring network and flow conditions are described below.

2.1 Landfill Design and Construction

The Pirkey Landfill was designed to receive CCR materials including fly ash, bottom ash, economizer ash, and stabilized flue gas desulfurization sludge (Arcadis 2022). The Landfill consists of cells which have been constructed periodically since 1984, when the first cell was developed at the northeastern corner of the Landfill. The most recent cell that has been developed was constructed at the southeast corner of the Landfill beginning in 2018. The Landfill is now approximately 134 acres in size.

The Landfill was constructed within an unnamed tributary creek, and the base of the Landfill is partially excavated into the creek bed (Arcadis 2022). Earthen embankments were installed around portions of the Landfill to control stormwater flow. Leachate is drained from the Landfill via bottom area drains and collection pipes installed at the base of the Landfill. From previous investigations of the Landfill summarized by Arcadis (2022), the Landfill was constructed with an engineered liner. The initial cells included a 3-foot thick compacted soil liner. In 1995, the design was modified to include a 60-mil thick high-density polyethylene (HDPE) geomembrane liner overlying a geosynthetic clay liner. The most recent cell was constructed with a single-composite liner system consisting of, from top to bottom: a 2-foot thick leachate drainage layer; a 60-mil thick HDPE geomembrane liner; and a 2-foot thick compacted clay liner (Akron Consulting, LLC 2022).

As of December 2022, the 2018 expansion is the only cell still actively receiving waste. The approximate area of active waste placement is shown in **Figure 2**. The remainder of the Landfill is either considered closed and covered by a final vegetative cover or closure turf material or considered inactive with temporary soil cover (AEP 2022).

2.2 Regional Geology / Site Hydrogeology

The Landfill is positioned on an outcrop of the Eocene-age Recklaw Formation, which consists predominantly of clay and fine-grained sand (Arcadis 2022). The Recklaw Formation is underlain by the Carrizo Sand, which crops out in the topographically lower southern portion of the plant. The Carrizo Sand consists of fine- to medium-grained sand interbedded with silt and clay.

The Landfill monitoring well network monitors groundwater within the uppermost aquifer, which was defined by Arcadis (2022) as very-fine- to fine-grained clayey and silty sand located below and adjacent to the Landfill, between an elevation of approximately 270 and 330 feet above mean sea level. Cross sections and a cross-section location map from the Arcadis Monitoring Well Network Report (2022) are provided as **Attachment A**. Geologic cross sections C-C' and D-D' show the subsurface structure of the uppermost aquifer (indicated as clayey silty sand, brown to gray) underlying the Landfill. These geologic cross sections also demonstrate lateral continuity of the uppermost aquifer, spanning both directions underneath the entire length of the Landfill.

2.3 Groundwater Monitoring Network and Flow Conditions

The Landfill monitoring well network consists of upgradient monitoring wells AD-8, AD-12, AD-16, and AD-27, and downgradient compliance wells AD-23, AD-34, and AD-36. AD-36 was installed in April 2019 (after the initial monitoring well network was already in place) as a replacement for well AD-35, which was decommissioned in November 2018 due to the Landfill expansion (Arcadis 2022). The groundwater flow direction near the Landfill is south-southwesterly (**Figure 1**). Seasonal variability in groundwater flow direction has not been observed since the monitoring well network was installed.

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation methods, proposed alternative sources for boron and chloride, and future groundwater sampling requirements are described below.

3.1 Proposed Alternative Source

An initial review of site geochemistry, site historical data, and laboratory quality assurance and quality control data did not identify alternative sources for boron and chloride due to Type I (sampling), Type II (laboratory), or Type III (statistical evaluation) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with 30 TAC §352.941(a) and the draft TCEQ guidance for groundwater monitoring (TCEQ 2020). Based on a review of groundwater data, the SSI for boron was attributed to natural variation, a Type IV issue. The SSI for chloride was attributed to anthropogenic impacts associated with construction activities near the Landfill, which is a Type V issue.

3.1.1 Boron

An SSI for boron was observed at downgradient well AD-23. Boron concentrations at AD-23 are within the range of those observed at other wells in the groundwater monitoring network (**Figure 3**). Upgradient background well AD-8 consistently has greater boron concentrations than downgradient well AD-23. Given that the uppermost aquifer unit is horizontally continuous in the area surrounding the Landfill (**Attachment A**), migration of boron from this upgradient location to downgradient wells is feasible. Therefore, the boron concentrations observed at AD-23 are within the expected range attributable to natural variation within the aquifer.

Furthermore, it is difficult to quantify any increase in boron concentrations at AD-23 based on the February 2023 verification resample laboratory results. Boron was detected at AD-23 at concentrations between the method detection limit and the reporting limit; therefore, the value was J-flagged and interpreted as estimated (**Attachment B**). The equipment blank associated with AD-23 also had detectable levels of boron. The detected boron concentration in the equipment blank (estimated [J-flagged] value of 0.009 milligrams per liter [mg/L]) was more than 10% of the reported value for boron in sample AD-23 (estimated [J-flagged] value of 0.049 mg/L), which could result in a high bias in the AD-23 boron results.

Sulfate concentration trends at AD-23 do not support a release from the Landfill. Sulfate is considered a geochemically conservative parameter and indicator for potential CCR releases. A review of the sulfate concentrations at downgradient well AD-23 over time do not display an increasing trend (**Figure 4**). A leachate sample collected in February 2023 from the Landfill had a reported sulfate concentration of 329 mg/L, which is over an order of magnitude higher than those observed at AD-23 (**Attachment C**). If Landfill leachate were impacting groundwater quality at downgradient wells, an increase in sulfate concentrations at AD-23 would also be expected. Therefore, the variability of boron in groundwater at AD-23 should not be attributed to a release from the Landfill.

3.1.2 Chloride

An SSI for chloride was observed at well AD-36, which is located immediately downgradient of the Landfill adjacent to a non-CCR pond. A number of construction activities were completed in the vicinity of AD-36 in late 2022 and early 2023, including earthworks and construction to support

the installation of an evaporation system associated with plant closure. An area of the non-CCR pond immediately adjacent to AD-36 was bermed and lined to support its use as brine storage, as shown in the photograph provided in **Figure 5**.

Well AD-36 is screened from 5-15 feet below ground surface, as shown in the boring log and well construction diagram provided as **Attachment D**. Given the proximity of AD-36's screen to the ground surface and the construction activities occurring immediately adjacent to AD-36 within the non-CCR pond, these construction activities likely resulted in a change to groundwater composition at AD-36. The location of AD-36 relative to the brine storage area that was recently constructed is shown in **Figure 6**.

The attribution of the chloride SSI to anthropogenic impacts associated with site construction instead of a release from the Landfill is further support by the lack of increasing sulfate concentrations at AD-36. As discussed in Section 3.1.1, sulfate is an indicator for potential CCR releases. A review of the sulfate concentrations at downgradient well AD-36 over time do not display an increasing trend (**Figure 4**). Therefore, the change in chloride in groundwater at AD-36 should not be attributed to a release from the Landfill.

3.2 Sampling Requirements

As the ASD presented above supports the position that the identified SSIs are not due to a release from the Pirkey Landfill, the unit will remain in the detection monitoring program. Groundwater at the unit will continue to be sampled for Appendix III parameters semiannually.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.941(c)(2) and supports the position that the SSIs for boron and chloride identified during detection monitoring in November 2022 were not due to a release from the Landfill. The identified SSIs should instead be attributed to natural variation (boron) and anthropogenic impacts due to site construction activities (chloride). Therefore, no further action is warranted, and the Pirkey Landfill will remain in the detection monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment E.**

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TABLES

Table 1. Detection Monitoring Data Evaluation
Alternative Source Demonstration Report
Pirkey Plant, Landfill

Analyte	Unit	Description	AD-23		AD-34		AD-36	
			11/14/2022	2/28/2023	11/14/2022	2/28/2023	11/14/2022	2/28/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0433		0.145		0.0702	
		Analytical Result	**0.078**	**0.049 J1**	0.067	--	0.068	--
Calcium	mg/L	Intrawell Background Value (UPL)	0.536		42.8		0.304	
		Analytical Result	0.24	--	**44.6**	41.9	0.28	--
Chloride	mg/L	Intrawell Background Value (UPL)	8.88		9.35		9.54	
		Analytical Result	7.49	--	7.47	--	**11.1**	**11.7**
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00		1.29		0.0800	
		Analytical Result	0.06	--	0.44	--	0.07	--
pH	SU	Intrawell Background Value (UPL)	5.2		4.2		5.7	
		Intrawell Background Value (LPL)	2.8		2.9		3.5	
		Analytical Result	4.5	--	3.5	--	4.5	--
Sulfate	mg/L	Intrawell Background Value (UPL)	14.5		1,280		4.20	
		Analytical Result	8.03	--	1,250	--	2.93	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	111		1,700		98.5	
		Analytical Result	80	--	**1,720**	1,640	50	--

Notes:
Bold values exceed the background value.
Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit
J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

FIGURES

Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Groundwater Elevation Contours (Inferred)
- Approximate Groundwater Flow Direction

Notes

- Monitoring well coordinates and water level data (collected on November 15, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation Update (Arcadis, 2022) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- AD-10, AD-19, AD-20, AD-21, AD-29, and W-3 were not gauged during the November 2022 event.
- AD-35 was abandoned on November 13, 2018.

1,000 500 0 1,000 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED PROFESSIONAL ENGINEER

Beth Ann Gross

Digitally signed by Beth Gross,
Date: 2023.01.23 09:40:36 -05'00'

Texas Eng Firm
Registration No. 1182

Potentiometric Contours - Uppermost Aquifer
November 2022

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2023/01/17

Figure 1

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2022\AEP-Pirkey_GW_2022-11November.mxd. ASoltero. 1/17/2023. Project/Phase/Task.

Legend

- Upgradient Well
- Downgradient Well
- Out of Network Well
- Abandoned Well
- Former Lignite Mine
- Waste Placement
- Landfill

Notes

- Monitoring well coordinates and water level data (collected on June 20-22, 2022) provided by AEP.
- AD-35 was abandoned on November 13, 2018.
- Active Waste Placement location is approximate.

1,000 500 0 1,000 Feet

Landfill Location Relative to Former Lignite Mine Area

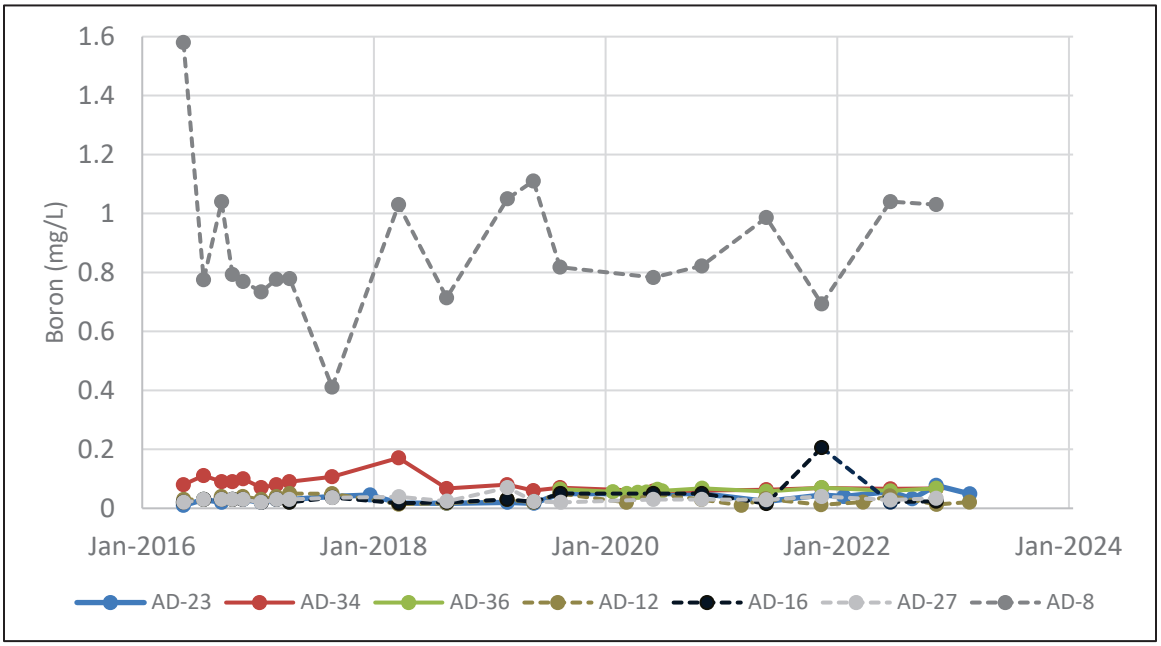
AEP Pirkey Power Plant
Hallsville, Texas

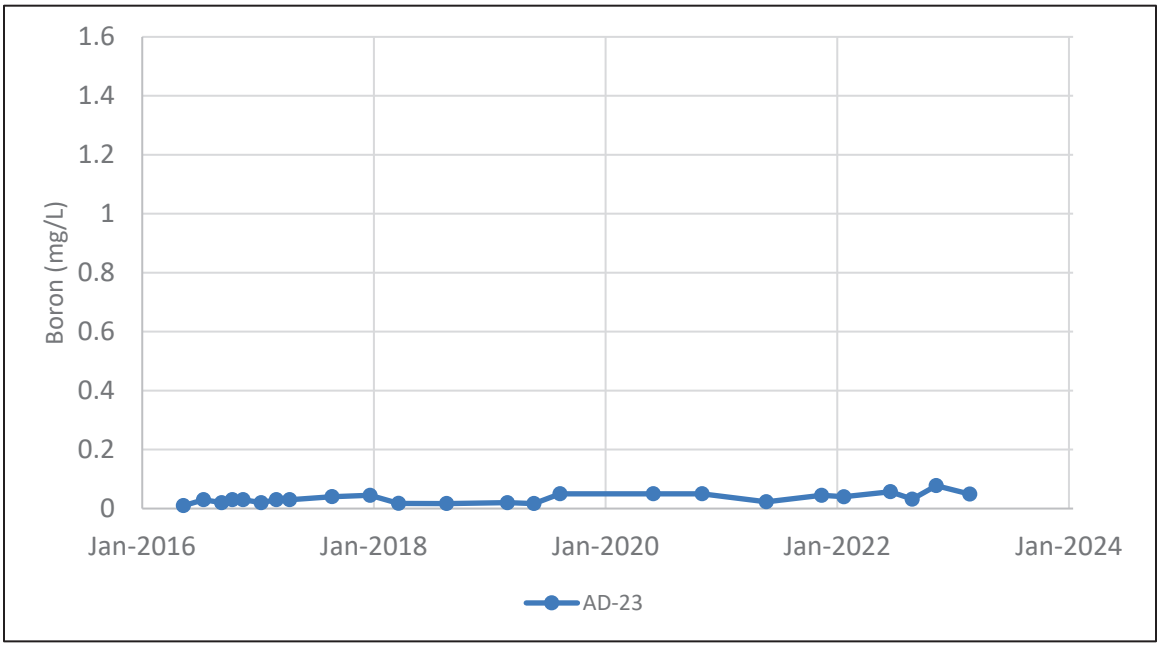
Geosyntec consultants

Columbus, Ohio | 2023/08/28

Figure 2

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\Pirkey LF ASD Site Layout waste placement.mxd. hduff. 8/28/2023. Project/Phase/Task.





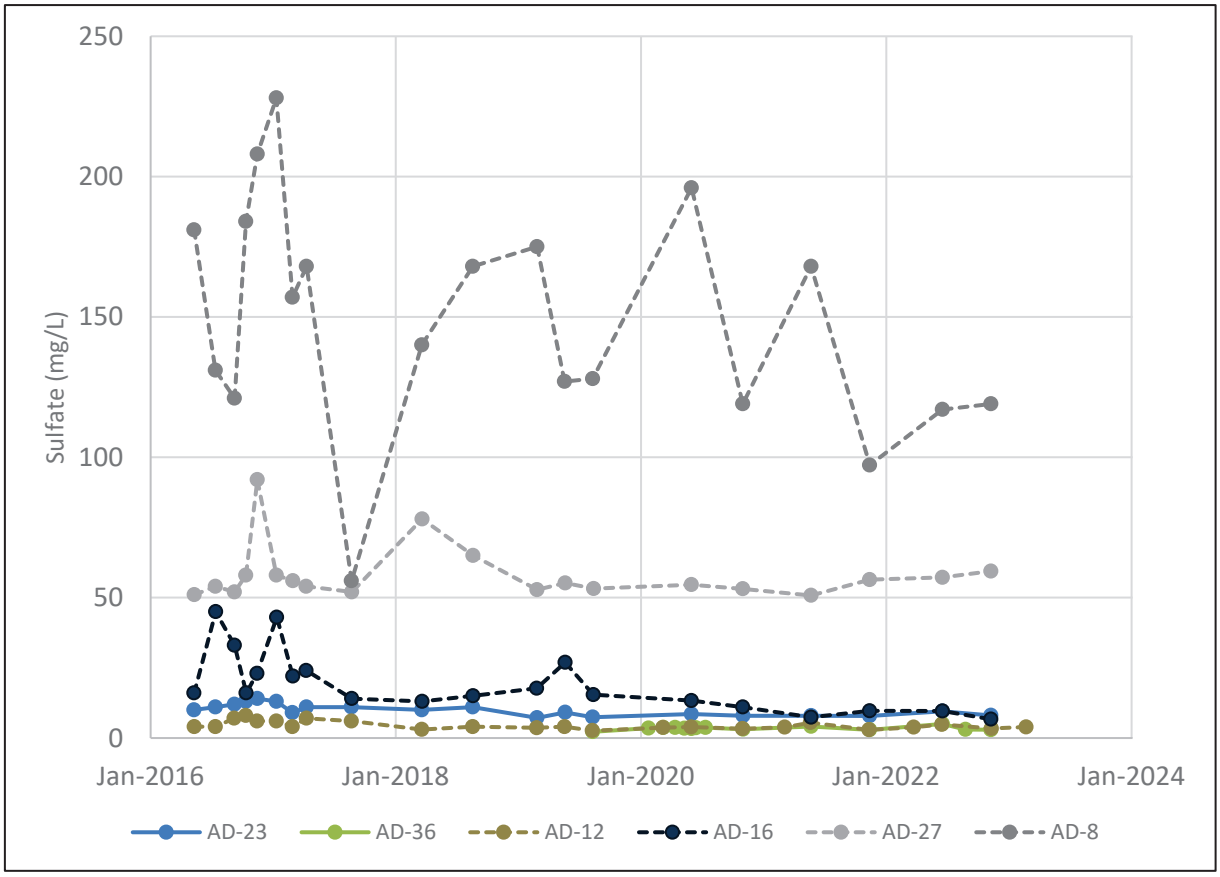
Notes: Boron concentrations are shown in milligrams per liter (mg/L). Solid lines represent downgradient wells and dashed lines represent upgradient wells.

Boron Time Series Graph
Pirkey Landfill

Geosyntec consultants | AMERICAN ELECTRIC POWER

Columbus, Ohio | Aug-2023

Figure 3



Notes: Sulfate concentrations are shown in milligrams per liter (mg/L). Solid lines represent downgradient wells and dashed lines represent upgradient wells. AD-34 is not shown due to effect of acid mine drainage on sulfate concentrations at that location.

Sulfate Time Series Graph
Pirkey Landfill

Geosyntec consultants

AMERICAN ELECTRIC POWER

Figure 4

Columbus, Ohio

Aug-2023

Notes: Photograph illustrating the construction of a lined brine tank immediately adjacent to monitoring well AD-36. The photograph was taken looking south on July 28, 2023.

Non-CCR Pond Construction Photograph
Pirkey Landfill

Geosyntec consultants | AMERICAN ELECTRIC POWER

Columbus, Ohio | Aug-2023

Figure **5**

Notes: Photograph depicting the location of AD-36 relative to the newly constructed brine tank portion of the non-CCR pond. The photograph was taken looking northwest on August 28, 2023.

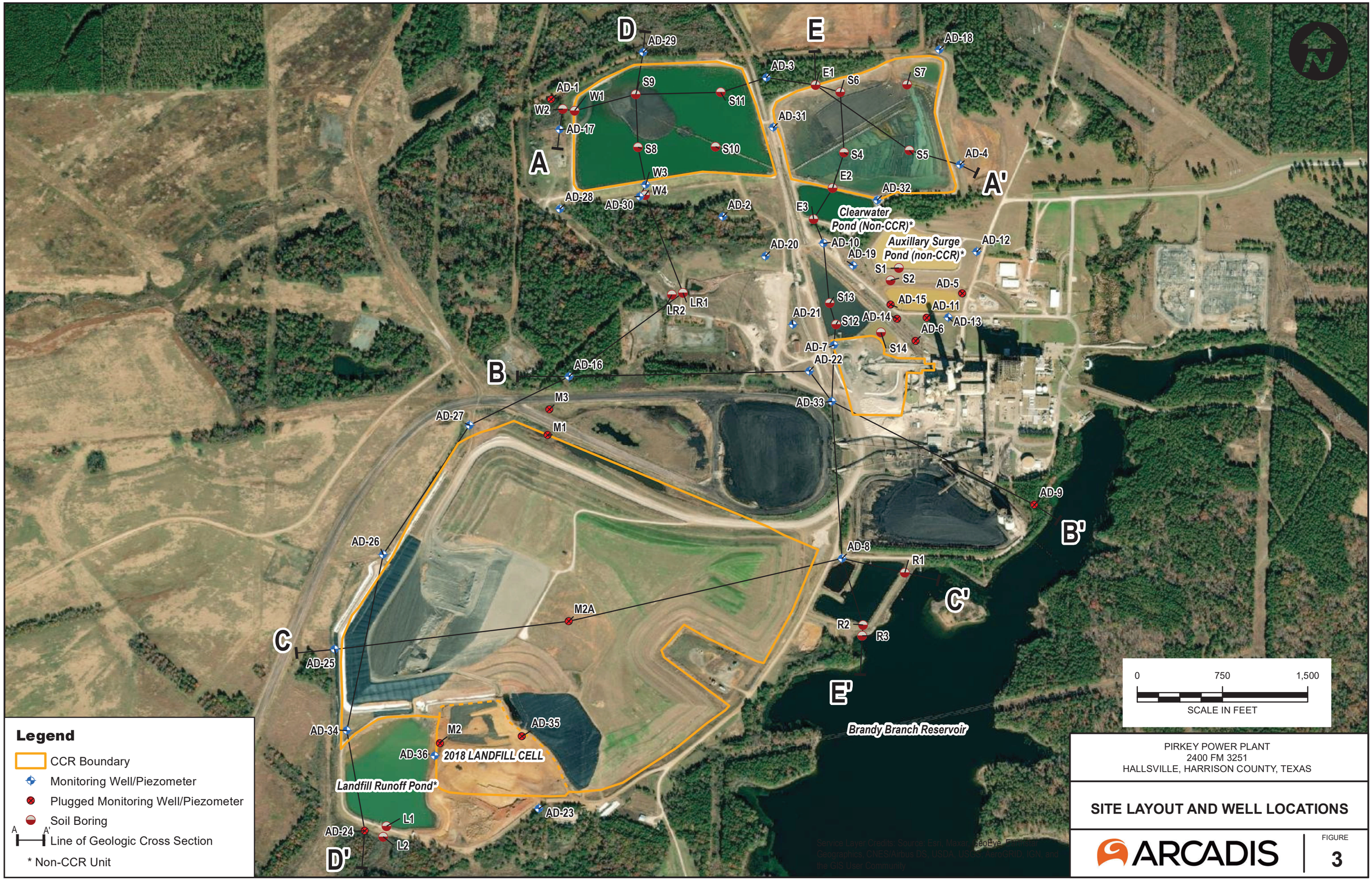
AD-36 Location Photograph
Pirkey Landfill

Geosyntec consultants | AMERICAN ELECTRIC POWER

Columbus, Ohio | Aug-2023

Figure 6

ATTACHMENT A
Arcadis Geologic Cross Sections


D
E
A
A'
B
B'
C
C'
D'
E'
AD-29
AD-18
AD-3
E1
S6
S7
AD-1
W1
W2
S9
S11
AD-17
AD-31
S8
S10
S4
S5
AD-4
W3
W4
E2
AD-32
AD-28
AD-30
AD-2
E3
Clearwater Pond (Non-CCR)*
AD-20
AD-10
Auxillary Surge Pond (non-CCR)*
AD-12
AD-19
S1
S2
AD-5
LR1
LR2
S13
AD-15
AD-11
AD-21
S12
AD-14
AD-13
AD-6
S14
AD-7
AD-22
AD-16
M3
AD-33
AD-27
M1
AD-9
AD-26
AD-8
R1
M2A
R2
R3
AD-25
AD-34
M2
AD-35
AD-36
2018 LANDFILL CELL
Landfill Runoff Pond*
AD-23
L1
AD-24
L2
Brandy Branch Reservoir
0
750
1,500
SCALE IN FEET
Legend
CCR Boundary
Monitoring Well/Piezometer
Plugged Monitoring Well/Piezometer
Soil Boring
Line of Geologic Cross Section
* Non-CCR Unit
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS
SITE LAYOUT AND WELL LOCATIONS
ARCADIS
FIGURE
3
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Document Path: T:_ENV\AEP\Pirkey Plant\MXD\Updated\Figure 3 - Site Layout and Well Locations.mxd

WEST

C

EAST

C'

LANDFILL

Approximate lateral extent of the former lignite mine

370'
360'
350'
340'
330'
320'
310'
300'
290'

ELEVATION (FEET MSL)

AD-25

CLAYEY SAND

SANDY CLAY

LANDFILL
LOW-PERMEABILITY LINER
(CLAY, PVC, OR HDPE)

CCR FILL
(HEIGHT VARIES)

AD-8

R1

SILTY SANDY CLAY.

CLAYEY SILTY SAND.

SILTY SANDY CLAY.

CLAYEY SILTY SAND, BROWN TO GRAY.

M2A
(PLUGGED)

Figure modified by Geosyntec, 2022. Original file from: Arcadis, 2022. Landfill - CCR Groundwater Monitoring Well Network Evaluation Update - H.W. Pirkey Power Plant

0 500'
HORIZONTAL SCALE

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED
PROFESSIONAL SCIENTIST

1-20-22

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (MAY 2021)

BASE OF CCR UNIT

PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

CROSS SECTION
C - C'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6

NORTH

D

SOUTH

D'

WEST BOTTOM ASH POND

PERIMETER BERM (EL. 357') (A)

W3 (PW-3)

AD-29

WATER AND CCR FILL (A)

S9

S8

COHESIVE FILL (B)

AD-30

SILTY SANDY CLAY, RED/BROWN/GRAY.

LR-1

AD-16

SILTY SANDY CLAY, TAN TO GRAY.

AD-27

LANDFILL

LANDFILL RUNOFF POND (NON-CCR UNIT) (C)

Approximate lateral extent of the former lignite mine

SILTY CLAYEY SAND

AD-26

CLAYEY SAND

SANDY CLAY, BROWN.

LANDFILL LOW-PERMEABILITY LINER (CLAY, PVC, OR HDPE)

CLAY, GRAY

AD-34

CLAY W/CLAYEY SAND STREAKS, ORANGE/BROWN.

AD-24

CLAY, GRAY

SANDY CLAY AND CLAYEY GRAVEL, GRAY.

CLAYEY SILTY SAND, BROWN TO GRAY, VERY FINE GRAINED.

BLACK LIGNITE

ELEVATION (FEET MSL)

360' 350' 340' 330' 320 310' 300' 290' 280' 270'

Figure modified by Geosyntec, 2022. Original file from: Arcadis, 2022. Landfill - CCR Groundwater Monitoring Well Network Evaluation Update - H.W. Pirkey Power Plant

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST
1-2022

0 600'
HORIZONTAL SCALE

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (MAY 2021)
- BASE OF CCR UNIT

NOTES:

A) TOP OF WEST BOTTOM ASH POND PERIMETER BERM ELEVATION IS 357', OPERATING LEVEL IS 354' (JOHNSON & PACE, MAY 2011); BASE ELEVATION OF WEST BOTTOM ASH POND IS 347' (SARGENT & LUNDY, JANUARY 1983).
B) COMPACTED COHESIVE SOIL FROM ELEVATION 344' TO 347' (SARGENT &LUNDY SEPTEMBER 1984; AMEC, AUGUST 2011).
C) LANDFILL RUNOFF POND PERIMETER BERM APPROXIMATE ELEVATION 302' MSL, BASE OF LANDFILL RUNOFF POND APPROXIMATE ELEVATION 286' MSL. NORMAL OPERATING LEVEL 288' MSL (JOHNSON & PACE MAY 2011).

PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

CROSS SECTION
D - D'

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

ATTACHMENT B
February 2023 Pirkey Landfill Resample Laboratory Analytical Report

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230702 **Customer: Pirkey Power Station** **Date Reported: 04/06/2023**

Customer Sample ID: AD-23
Customer Description:
Lab Number: 230702-001
Preparation:
Date Collected: 02/28/2023 12:05 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.049	mg/L	1	0.050	0.009	J1	GES	03/08/2023 19:48	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34
Customer Description:
Lab Number: 230702-002
Preparation:
Date Collected: 02/28/2023 12:13 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	41.9	mg/L	1	0.05	0.02		GES	03/08/2023 20:03	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: DUPLICATE AD-34
Customer Description:
Lab Number: 230702-003
Preparation:
Date Collected: 02/28/2023 12:13 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	40.8	mg/L	1	0.05	0.02		GES	03/08/2023 20:08	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: EQUIPMENT BLANK
Customer Description:
Lab Number: 230702-004
Preparation:
Date Collected: 02/28/2023 11:35 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.009	mg/L	1	0.050	0.009	J1	GES	03/08/2023 20:14	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	03/08/2023 20:14	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230702 **Customer: Pirkey Power Station** **Date Reported: 04/06/2023**

Customer Sample ID: FIELD BLANK
Lab Number: 230702-005
Date Collected: 02/28/2023 11:37 EST

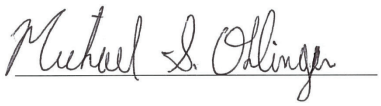
Customer Description:
Preparation:
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	03/08/2023 20:19	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	03/08/2023 20:19	EPA 200.8-1994, Rev. 5.4

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

ATTACHMENT C
February 2023 Pirkey Landfill Leachate Laboratory Analytical Report

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 230659 **Customer: Pirkey Power Station** **Date Reported: 04/06/2023**

Customer Sample ID: EBAP
Customer Description: TG-32
Lab Number: 230659-003
Preparation:
Date Collected: 03/01/2023 00:23 EST
Date Received: 03/02/2023 10:30 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.59	mg/L	5	0.25	0.05		CRJ	03/16/2023 13:42	EPA 300.1 -1997, Rev. 1.0
Chloride	84.5	mg/L	5	0.10	0.05		CRJ	03/16/2023 13:42	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.56	mg/L	5	0.15	0.05		CRJ	03/16/2023 13:42	EPA 300.1 -1997, Rev. 1.0
Sulfate	2780	mg/L	100	20	3		CRJ	03/16/2023 19:11	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	03/03/2023 11:26	SM 2320B-2011
TDS, Filterable Residue	3900	mg/L	20	1000	400		SDW	03/07/2023 10:50	SM 2540C-2015

Customer Sample ID: Leachate
Customer Description: TG-32
Lab Number: 230659-004
Preparation:
Date Collected: 02/28/2023 10:55 EST
Date Received: 03/02/2023 10:30 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.82	mg/L	5	0.25	0.05		CRJ	03/16/2023 14:15	EPA 300.1 -1997, Rev. 1.0
Chloride	41.7	mg/L	5	0.10	0.05		CRJ	03/16/2023 14:15	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.47	mg/L	5	0.15	0.05		CRJ	03/16/2023 14:15	EPA 300.1 -1997, Rev. 1.0
Sulfate	329	mg/L	50	10	2		CRJ	03/16/2023 21:23	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	94	mg/L	1	20	5		MGK	03/03/2023 11:26	SM 2320B-2011
TDS, Filterable Residue	600	mg/L	20	1000	400	J1	SDW	03/03/2023 12:09	SM 2540C-2015

ATTACHMENT D
AD-36 Boring Log and Well Construction Diagram

SOIL/WELL BORING LOG

Auckland Consulting LLC

TBPE Firm No. F16721

Project:	AEP - Pirkey Power Station Harrison County
Drilling Co.:	C&S Lease
Driller:	Buford E. Collier
Drilling Method:	Hollow Stem Auger

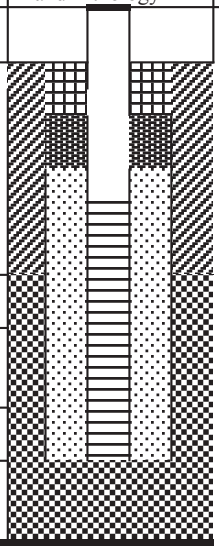
STATE OF TEXAS
JOHN J. TAYNTOR
99202
LICENSED PROFESSIONAL ENGINEER

04/30/2019

Well/Boring #:	AD-36	Date Drilled:	4/24/19
Depth of Boring/well:	15 feet	Diameter of Boring:	8.25 inches
Length of Screen:	10 feet	Diameter of Screen:	2 inches
Length of Casing:	5 feet	Diameter of Casing:	2 inches
Filter Pack:	20/40	Slot Size:	0.010 inches
Logged By:	John J. Tayntor	Screen Material:	Sch 40 PVC

- Concrete/cement
- Clay
- Silty Sand
- Bentonite
- Silty Clay
- Sandy Clay
- Well Screen
- Sand
- Lignite
- Gravel
- ▽ - Initial Water Level

Depth Feet	GEOLOGIC DESCRIPTION	Lithology Classification	PID ppm	Depth Feet	Remarks
0.0					
	Fill - Reddish Brown, Sandy Lean Clay (CL) with gravel	CL/Fill		0-9	
5.0					
10.0	Reddish Brown and Tan, Clayey Sand (SC), with gravel	SC		9-11	
	Reddish brown, Sandy Lean Clay (CL), few gravel	CL		11-14	
15.0	Reddish brown, Clayey Sand (SC), with gravel	SC		14-15	
	Well TD = 15 feet.				



*Soil descriptions based on visual observations and intervals are approximate.

MW Location Coordinates: N6871017.4, E3202874.4

ATTACHMENT E
Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Pirkey Landfill CCR management area and that the requirements of 30 TAC §352.941(c)(2) have been met.

Beth Ann Gross
Printed Name of Licensed Professional Engineer

Beth Ann Gross
Signature

Geosyntec Consultants
2039 Centre Pointe Blvd, Suite 103
Tallahassee, Florida 32308

Texas Registered Engineering Firm
No. F-1182

79864	Texas	September 5, 2023
License Number	Licensing State	Date

APPENDIX 4- Field Reports

CCR Groundwater Monitoring Well Inspection Form

Facility: Pilkey Sampling Period: 2-2023

Sampling Contractor: Eagle Signature: Matt Hamilton

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
B-2				✓	✓		✓	no lock no label
AD-12	✓	✓	✓	✓	–		✓	labeled as MW-12
AD-32	✓	✓	✓	✓	–	✓	–	
AD-31	✓	–	–	✓	–	✓	✓	
AD-26	✓	✓	✓	✓	–	–	✓	
AD-25	✓	✓	–	–	✓	–	✓	
AD-36	✓	✓	✓	✓	–	✓	✓	
AD-23	✓	✓	✓	✓	✓	–	✓	

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP PIKE PP

Sampling Period: FEBRUARY 27-28, 2023

Sampling Contractor: EAGLE

Signature: [signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓	✓	✓	✓	
AD-2	✓	✓	✓	✓	✓	✓	✓	
B-3				✓	✓		✓	NO LOCK NO WATEL
AD-18	✓	✓	✓	✓	✓	✓	✓	
AD-4					✓	✓	✓	NO LOCK, NEEDS BETTER ACCESS
AD-7	✓	✓	✓	✓		✓	✓	HOUSING SEVERLY RUSTED HARD TO OPEN
AD-34	✓	✓	✓	✓		✓	✓	HINGE RUSTED + BROKEN

ACCESS IS ALONG STEEP SLOPE ON ACROSS DITCH SOMETIMES WATER

WELL HOUSING CAN BE OPENED WITH OUT UNLOCKING

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

Facility Name	AEP PIRKEY PP
Sample by	Kerry McDonald

Sample Location ID	AD-2

Depth to water, feet (TOC)	15.92
Measured Total Depth, feet (TOC)	40.36

Depth to water date	02/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1038	15.98	200	3.86	772	1.2	2.13	399	20.76		
1043	16.21	200	3.81	751	0.0	1.97	398	20.69		
1048	16.28	200	3.78	752	0.0	1.91	398	20.68		
1053	16.30	200	3.78	752	0.0	1.84	397	20.72		

Total volume purged	
Sample appearance	CLEAR
Sample time	1055
Sample date	02/27/23

Facility Name	ACP PIANO PP
Sample by	Kerry McDonald

Sample Location ID	AO-4

Depth to water, feet (TOC)	10.75
Measured Total Depth, feet (TOC)	47.29

Depth to water date	02/28/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0856	10.79	180	4.84	84	18.3	4.21	414	18.80		
0901	10.82	180	4.87	84	16.8	2.89	408	19.63		
0906	10.86	180	4.87	84	16.5	2.85	402	19.87		
0910	10.90	180	4.89	84	17.2	2.81	396	19.91		

Total volume purged	
Sample appearance	Clear
Sample time	0913
Sample date	02/28/23

DUP-2 WQ Metals 1300

Facility Name	Pinson PP
Sample by	Kelly McDonald

Sample Location ID	AD-7

Depth to water, feet (TOC)	14.11
Measured Total Depth, feet (TOC)	41.98

Depth to water date	02/28/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1001	14.51	170	3.48	337	1.3	2.87	446	23.21		
1006	14.53	170	3.58	360	2.4	1.34	439	23.39		
1011	14.58	170	3.62	368	2.8	1.29	431	23.42		
1016	14.63	170	3.63	374	2.2	1.25	427	23.47		

Total volume purged	
Sample appearance	Clear
Sample time	1018
Sample date	02/28/23

Facility Name	Pinkey
Sample by	Matt Hamilton

Sample Location ID	AD-12
Depth to water date	2-27-23

Depth to water, feet (TOC)	13.25
Measured Total Depth, feet (TOC)	52.00

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
939	13.64	300	3.68	57	0	6.42	208	19.86		
944	14.03	300	3.96	50	0	5.38	241	20.64		
949	14.00	300	3.80	50	3.8	5.33	264	20.84		
954	14.14	300	3.77	50	2.1	5.27	273	20.63		

Total volume purged	
Sample appearance	clear
Sample time	956
Sample date	2-27-23

Dup-1
922

Facility Name	AEP Pinnon PP
Sample by	Kenny McDonald

Sample Location ID	AD-13

Depth to water, feet (TOC)	11.40
Measured Total Depth, feet (TOC)	40.70

Depth to water date	02/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0755	12.02	200	5.30	426	202	6.24	301	20.31		
0800	12.15	200	4.91	423	178	2.49	284	20.25		
0805	12.23	200	4.83	421	101	2.42	242	20.19		
0810	12.33	200	4.80	419	97.4	2.39	238	20.12		
0815	12.41	200	4.78	419	89.1	2.34	231	20.26		

Total volume purged	
Sample appearance	
Sample time	0817
Sample date	02/27/23

Facility Name	PIPKIN PP
Sample by	Kenny McDonald

Sample Location ID	MD-18

Depth to water, feet (TOC)	3.85
Measured Total Depth, feet (TOC)	28.42

Depth to water date	02/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1207	5.01	110	4.08	58	7.3	3.41	431	16.02		
1212	5.97	110	4.35	52	4.2	2.73	418	17.53		
				won't hold water level						

Total volume purged	
Sample appearance	CLEAR
Sample time	0825
Sample date	02/28/23

Facility Name	AFP Pitman PP
Sample by	Kenny McDonald

Sample Location ID	AO-22

Depth to water, feet (TOC)	9.04
Measured Total Depth, feet (TOC)	32.70

Depth to water date	02/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0850	9.10	180	4.05	949	8.2	3.16	335	20.20		
0855	9.11	180	4.05	967	4.1	1.47	334	20.34		
0900	9.15	180	4.05	974	1.3	1.42	328	20.38		
0905	9.17	180	4.06	977	1.6	1.38	325	20.41		

Total volume purged	
Sample appearance	Clear
Sample time	0907
Sample date	02/27/23

Facility Name	P.View
Sample by	19-17 / Hamilton

Depth to water, feet (TOC)	30.54
Measured Total Depth, feet (TOC)	38.50

Sample Location ID	AD-23
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1038	30.72	220	4.07	72	0	2.86	239	21.88		
1043	30.72	220	4.17	71	0	3.15	230	21.76		
1048	30.73	220	4.21	71	2.7	3.25	227	21.64		
1053	30.74	220	4.33	70	3.9	3.32	228	21.65		
1058	30.74	220	4.39	69	4.5	3.33	227	21.63		
1103	30.74	220	4.42	70	4.4	3.34	226	21.64		

Total volume purged	
Sample appearance	Clear
Sample time	1105
Sample date	2-28-23

Facility Name	Pillow
Sample by	Matt Hemi Hur

Depth to water, feet (TOC)	8.83
Measured Total Depth, feet (TOC)	27.38

Sample Location ID	MD-23
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
916	9.03	120	4.71	1,190	20.7	1.76	184	20.35		
921	9.15	120	3.65	1,176	35.3	0.72	221	20.64		
926	9.23	120	3.51	1,166	23.7	0.58	234	20.34		
931	9.30	120	3.50	1,176	21.6	0.47	235	20.51		
936	9.37	120	3.44	1,176	21.5	0.43	236	20.92		

Total volume purged	
Sample appearance	Clear
Sample time	938
Sample date	2-28-23

Facility Name	Pinney
Sample by	Matt Hamill

Depth-to water, feet (TOC)	15.95
Measured Total Depth, feet (TOC)	42.79

Sample Location ID	AD-26
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
823	16.24	300	5.76	2,130	24.1	2.17	145	17.56		
828	16.54	300	4.27	2,080	69.8	0.96	221	14.24		
833	16.65	300	3.50	2,100	84.6	0.91	276	14.64		
838	16.71	300	3.10	2,080	68.5	1.14	306	14.73		
843	16.78	300	2.97	2,080	46.4	1.20	312	14.79		
848	16.84	300	2.97	2,070	31.5	1.11	307	14.76		
853	16.90	300	2.99	2,080	27.7	1.02	303	2.08		
858	16.95	300	3.00	2,080	27.5	1.00	302	20.06		

Total volume purged	
Sample appearance	clear
Sample time	900
Sample date	2-28-23

Landfill duplicate

1104

Facility Name	Pixley
Sample by	Matt Hamilton

Depth to water, feet (TOC)	16.41
Measured Total Depth, feet (TOC)	37.32

Sample Location ID	AD-31
Depth to water date	2-27-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1125	16.76	220	3.88	247	69.7	1.71	291	23.18		
1130	16.80	220	3.58	290	41.0	0.55	316	23.28		
1135	16.83	220	3.50	296	24.4	0.37	325	23.34		
1140	16.84	220	3.48	299	18.7	0.35	329	23.46		
1145	16.85	220	3.48	301	18.5	0.34	330	23.52		

Total volume purged	
Sample appearance	clear
Sample time	1147
Sample date	2-27-23

Facility Name	Pilkey
Sample by	Matt Hamilton

Depth to water, feet (TOC)	9.70
Measured Total Depth, feet (TOC)	34.61

Sample Location ID	AD-32
Depth to water date	2.27.23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1041	10.22	220	3.24	421	65.6	1.53	318	21.31		
1046	10.27	220	3.23	425	43.5	0.78	334	21.82		
1051	10.31	220	3.22	435	27.6	0.55	345	22.19		
1056	10.33	220	3.28	434	9.5	0.49	347	22.34		
1101	10.34	220	3.32	433	9.4	0.46	348	22.42		

Total volume purged	
Sample appearance	clear
Sample time	1103
Sample date	2.27.23

Facility Name	PIMM PP
Sample by	Kinny McDonald

Sample Location ID	AD-33

Depth to water, feet (TOC)	12.19
Measured Total Depth, feet (TOC)	32.50

Depth to water date	02/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0941	12.24	200	3.95	264	1.3	2.13	365	20.97		
0946	12.21	200	4.07	252	4.6	1.50	356	21.33		
0951	12.21	200	4.07	250	2.8	1.49	354	21.40		
0956	12.22	200	4.07	248	2.2	1.46	353	21.48		

Total volume purged	
Sample appearance	Clear
Sample time	0958
Sample date	02/27/23

Facility Name	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AO-34

Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	26.05

Depth to water date	02/28/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1056	0.74	120	3.87	1610	2.6	2.87	373	24.40		
1101	0.81	120	3.82	1610	3.4	1.36	364	24.42		
1106	0.90	120	3.81	1610	5.7	1.28	358	24.46		
1111	0.95	120	3.78	1630	7.2	1.24	353	24.46		

Total volume purged	
Sample appearance	CLEAR
Sample time	1113
Sample date	02/28/23

Facility Name	Pixley
Sample by	Matt Hamilton

Depth to water, feet (TOC)	7.69
Measured Total Depth, feet (TOC)	17.10

Sample Location ID	AD-36
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1011	8.01	220	4.60	97	17.3	2.01	93	21.76		
1016	8.06	220	4.56	70	4.9	0.51	158	21.18		
1021	8.08	220	4.53	64	4.2	0.45	173	21.34		

Total volume purged	
Sample appearance	clear
Sample time	1023
Sample date	2-28-36

Facility Name	Pilkey
Sample by	Matt Hamilton

Depth to water, feet (TOC)	16.55
Measured Total Depth, feet (TOC)	51.44

Sample Location ID	B-2
Depth to water date	2-27-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
839	16.91	300	4.46	230	0	1.70	123	14.52		
844	17.03	300	5.08	145	0	0.65	57	14.66		
849	17.16	300	5.01	134	0	0.59	53	14.59		

Total volume purged	
Sample appearance	clear
Sample time	852
Sample date	2-27-23

Dup - B

1159

Facility Name	ACP Pinhook PP
Sample by	Kenny McDonald

Sample Location ID	B-3

Depth to water, feet (TOC)	12.50
Measured Total Depth, feet (TOC)	37.49

Depth to water date	02/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1141	13.63	102	4.55	228	6.7	2.83	366	20.47		
1146	15.02	102	4.80	197	2.8	1.91	370	20.56		
			WON'T HOLD WATER LEVEL							

Total volume purged	
Sample appearance	Clear
Sample time	0755
Sample date	02/28/23

Facility Name	Pitney
Sample by	Matt Hamlin

Depth to water, feet (TOC)	—
Measured Total Depth, feet (TOC)	—

Sample Location ID	EBAP
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1123	—	—	4.47	4,576	6.7	5.30	335	24.61		

Total volume purged	
Sample appearance	clear
Sample time	1123
Sample date	2-28-23

Facility Name	
Sample by	P. Tilley Hunt / Hamilton

Depth to water, feet (TOC)	—
Measured Total Depth, feet (TOC)	—

Sample Location ID	Touchette
Depth to water date	2-28-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
955	—	—	4.4	695	5.4	0.30	176	22.7c		

Total volume purged	
Sample appearance	clear
Sample time	955
Sample date	2-28-23

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey

Sampling Period: June 2023

Sampling Contractor: Eagle

Signature: Matt Tannitos

Well No.	Well Locked	Fastener and Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Protective Cover, Barriers and Pad in Good Shape	Well Properly Labeled	Well Cap Present and Vented*	Comments
B-2				✓	✓		✓	no label, top won't close
AD-31	✓	✓	✓	✓	✓		✓	no label
AD-30	✓	✓	✓	✓	✓	✓	✓	
AD-17	✓	✓	✓		✓	✓	✓	overgrown
AD-27	✓	✓	✓		✓	✓	✓	overgrown
AD-28	✓	✓	✓	✓	✓	✓	✓	
AD-23	✓	✓	✓	✓	✓	✓	✓	
AD-3	✓	✓	✓		✓	✓	✓	overgrown

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP Pirkey PP Sampling Period: June 2023

Sampling Contractor: EAGLE Signature: [signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓	✓	✓	✓	
AD-7R	✓	✓	✓	✓	✓		✓	NO LABEL
B-3	✓	✓	✓	✓	✓		✓	NO LABEL
AD-18	✓	✓	✓		✓	✓	✓	TRAIL TO WELL + AREA AROUND WELL NEEDS CLEARING
AD-16	✓		✓		✓	✓	✓	TRAIL TO WELL NEEDS CLEARING NEEDS NEW LOCK
AD-07	✓	✓	✓	✓	✓	✓	✓	
AD-04					✓	✓	✓	NEEDS LOCK NEEDS WEED EATING LIMITED ACCESS TO WELL

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey

Sampling Period: June 2023

Sampling Contractor: Eagle

Signature:

Well No.	Well Locked	Fastener and Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Protective Cover, Barriers and Pad in Good Shape	Well Properly Labeled	Well Cap Present and Vented*	Comments
AD-12	S	S	S	S	S	S	S	
AD-32	S	S	S	S	S	S	S	
AD-2	S	S	S	S	S	S	S	
AD-28	S	S	S	S	S	S	S	
AD-26	S	S	S	S	S	S	S	
AD-34	S	S	S	S	4	S	S	Hinge Broken
AD-8	S	S	S	S	S	S	S	
AD-36	S	S	S	S	S	S	S	

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

Facility Name	AEP Pirtey
Sample by	BEB

Depth to water, feet (TOC)	16.49
Measured Total Depth, feet (TOC)	40.36

Sample Location ID	AD-2
Depth to water date	6/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1024	17.03	200	3.69	706	2.8	9.10	382	26.36		
1029	17.06	200	3.84	714	1.6	1.29	384	24.93		
1034	17.10	200	3.85	716	1.4	1.25	380	24.92		
1039	17.13	200	3.85	718	1.3	1.24	379	24.86		

Total volume purged	
Sample appearance	clear
Sample time	1042
Sample date	6/26/23

Facility Name	Pikey
Sample by	M.N / Hamilton

Depth to water, feet (TOC)	33.48
Measured Total Depth, feet (TOC)	57.49

Sample Location ID	AD-3
Depth to water date	6-27-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1044	33.72	220	6.01	206	348	1.53	197	28.55		
1046	33.86	220	5.99	185	12.1	1.11	186	25.98		
1054	33.95	220	5.92	173	6.9	1.01	173	25.61		
1059	34.07	220	5.84	171	6.8	1.08	170	25.55		

Total volume purged	
Sample appearance	clear
Sample time	1101
Sample date	6-27-23

Facility Name	AEP PIRKEY PP
Sample by	KENNY MIDDLETON

Sample Location ID	AD-04

Depth to water, feet (TOC)	14.13
Measured Total Depth, feet (TOC)	47.29

Depth to water date	06/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1053	14.19	164	4.47	98	42.3	4.28	377	24.68		
1058	14.23	164	4.51	98	37.6	3.74	362	24.59		
1103	14.25	164	4.53	95	36.5	3.69	360	24.55		
1108	14.41	164	4.53	92	34.9	3.63	366	24.51		

Total volume purged	
Sample appearance	TURBID
Sample time	1110
Sample date	06/27/23

Facility Name	AFP Pinkney PP
Sample by	Kerry McDonald

Sample Location ID	AD-07

Depth to water, feet (TOC)	14.96
Measured Total Depth, feet (TOC)	41.98

Depth to water date	06/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0934	15.13	174	3.84	316	1.1	2.13	321	24.91		
0939	15.20	174	3.80	321	0	1.84	321	24.83		
0944	15.24	174	3.77	334	0.8	1.80	321	24.77		
0949	15.26	174	3.76	338	0.4	1.77	322	24.75		

Total volume purged	
Sample appearance	CLEAR
Sample time	0951
Sample date	06/27/23

Facility Name	AEP Dirkey
Sample by	BEB

Depth to water, feet (TOC)	12.96
Measured Total Depth, feet (TOC)	31.33

Sample Location ID	AD-8
Depth to water date	6/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1005	13.28	168	5.68	565	14.0	2.42	120	26.20		
1010	13.33	168	5.73	578	7.6	2.11	166	26.11		
1015	13.35	168	5.78	582	7.2	2.08	162	26.10		
1020	13.38	168	5.79	583	7.1	2.04	158	26.04		

Total volume purged	
Sample appearance	clear
Sample time	1024
Sample date	6/27/23

Duplicate
900

Facility Name	AEP PIRKEY PP
Sample by	KENNY McDONALD

Sample Location ID	AD-7R

Depth to water, feet (TOC)	8.48
Measured Total Depth, feet (TOC)	33.03

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1025	8.48	120	4.67	241	6.4	2.04	273	28.92		
1030	8.50	120	4.76	240	2.1	1.98	265	28.08		
1035	8.50	120	4.81	246	1.7	1.94	257	27.13		
1040	8.51	120	4.83	247	1.5	1.91	253	27.04		
1045	8.50	120	4.88	250	1.3	1.87	249	26.92		

Total volume purged	
Sample appearance	CLEAR
Sample time	1047
Sample date	06/26/23

Facility Name	AEP Pinkey
Sample by	BES

Depth to water, feet (TOC)	12.82
Measured Total Depth, feet (TOC)	52.00

Sample Location ID	AD-12
Depth to water date	6/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0738	13.21	300	4.36	55	12.0	2.36	288	26.63		
0743	13.55	300	4.44	40	8.6	1.94	320	24.93		
0748	13.58	300	4.56	40	8.4	1.90	324	24.84		
0753	13.54	300	4.60	42	8.0	1.88	328	24.86		

Total volume purged	
Sample appearance	clear
Sample time	0755
Sample date	6/26/23

Facility Name	APP Plant PD
Sample by	Kenny McDonald

Sample Location ID	AP-13

Depth to water, feet (TOC)	12.29
Measured Total Depth, feet (TOC)	40.70

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0711	12.36	174	5.52	702	128	5.27	194	25.49		
0716	12.40	174	5.50	580	40.3	4.14	182	25.57		
0721	12.45	174	5.48	571	36.8	4.10	173	25.61		
0726	12.48	174	5.47	564	31.2	4.07	170	25.65		

Total volume purged	
Sample appearance	SLIGHTLY TURBID
Sample time	0728
Sample date	06/26/23

DUPLICATE-1 1200

Facility Name	AEP Pinney PP
Sample by	Kerry McDonald

Sample Location ID	AO-16

Depth to water, feet (TOC)	17.61
Measured Total Depth, feet (TOC)	38.24

Depth to water date	06/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0837	17.65	192	4.30	159	41.2	1.47	308	25.21		
0842	17.67	192	4.33	159	33.6	1.15	316	25.07		
0847	17.72	192	4.37	160	35.7	1.12	319	24.93		
0852	17.76	192	4.38	159	37.9	1.09	322	24.91		
0857	17.77	192	4.38	159	38.2	1.06	325	24.88		

Total volume purged	
Sample appearance	CLEAR
Sample time	0859
Sample date	06/27/23

Facility Name	
Sample by	P. Ickey, Matt Hamilton

Depth to water, feet (TOC)	20.96
Measured Total Depth, feet (TOC)	33.05

Sample Location ID	AD-17
Depth to water date	6-26-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1130	21.11	200	4.06	181	119	3.78	376	24.18		
1135	21.12	200	4.35	92	39.3	3.56	399	25.9		
1140	21.12	200	4.46	80	4.9	3.32	414	25.22		
1145	21.12	200	4.48	76	4.3	3.27	422	24.96		

Total volume purged	
Sample appearance	Clear
Sample time	1147
Sample date	6-26-23

Facility Name	AEP PIRKEY PP
Sample by	Kenny McDonald

Sample Location ID	AD-18

Depth to water, feet (TOC)	5.46
Measured Total Depth, feet (TOC)	28.42

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1138	6.24	108	4.52	50	21.9	2.27	264	25.13		
1143	7.09	108	4.40	51	18.6	1.93	284	25.16		
				WON'T HOLD	WATER LEVEL					

Total volume purged	
Sample appearance	Clear
Sample time	0742
Sample date	06/27/23

Facility Name	AEP Pirkon PP
Sample by	Kenny McDonald

Sample Location ID	AD-22

Depth to water, feet (TOC)	10.22
Measured Total Depth, feet (TOC)	32.70

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0826	10.42	164	4.28	810	8.4	4.12	226	25.23		
0831	10.44	164	4.13	852	0	2.37	224	25.18		
0836	10.47	164	4.09	857	1.1	2.31	218	25.07		
0841	10.50	164	4.07	861	0	2.26	216	24.91		

Total volume purged	
Sample appearance	Clear
Sample time	0843
Sample date	06/26/23

Facility Name	Pixley
Sample by	Clint Hamilton

Depth to water, feet (TOC)	25.97
Measured Total Depth, feet (TOC)	35.20

Sample Location ID	AD-23
Depth to water date	6-27-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
944	30.25	220	4.63	314	8.3	7.15	262	25.01		
949	30.27	220	4.54	131	14.4	3.05	267	26.69		
954	30.28	220	4.53	106	7.2	2.51	274	26.16		
959	30.28	220	4.48	97	6.5	2.24	275	25.86		
1004	30.28	220	4.47	92	6.3	2.18	277	25.72		

Total volume purged	
Sample appearance	clear
Sample time	1006
Sample date	6-27-23

Facility Name	Pixley
Sample by	Matt Hamilton

Sample Location ID	AD-25
Depth to water date	6-27-23

Depth to water, feet (TOC)	8.46
Measured Total Depth, feet (TOC)	27.38

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
855	8.77	120	4.42	875	37.2	2.24	275	29.35		
900	8.85	120	4.59	979	37.1	1.63	226	27.49		
905	8.93	120	4.73	1,000	37.5	1.45	193	27.05		
910	9.00	120	4.78	1,024	37.3	1.38	184	26.82		

Total volume purged	
Sample appearance	clear
Sample time	912
Sample date	6-27-23

Facility Name	AEP Pirkey
Sample by	BOS

Depth to water, feet (TOC)	15.42
Measured Total Depth, feet (TOC)	42.73

Sample Location ID	AD-26
Depth to water date	6/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0730	15.88	300	4.76	2030	75.4	15.6	156	24.67		
0735	16.18	300	3.56	2080	48.0	2.4	243	24.14		
0740	16.25	300	3.36	2070	27.7	1.8	249	24.59		
0745	16.27	300	3.32	2060	26.8	1.7	250	24.62		

Total volume purged	
Sample appearance	clear
Sample time	0743
Sample date	6/27/23

Facility Name	
Sample by	Pilcey, Martin / Hamilton

Depth to water, feet (TOC)	19.95
Measured Total Depth, feet (TOC)	40.07

Sample Location ID	AD-27
Depth to water date	6-27-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
8:08	20.28	300	4.25	266	113	2.41	262	27.60		
813	20.32	300	4.27	236	27.9	2.48	275	29.62		
818	20.34	300	4.26	235	12.2	2.22	280	25.31		
823	20.35	300	4.25	234	7.6	2.14	283	25.04		
828	20.36	300	4.24	233	7.4	2.11	283	24.91		

Total volume purged	
Sample appearance	clear
Sample time	830
Sample date	6-27-23

Facility Name	AEP Dirkey
Sample by	BCS

Depth to water, feet (TOC)	17.95
Measured Total Depth, feet (TOC)	38.54

Sample Location ID	AD-28
Depth to water date	6/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1108	19.28	220	4.43	119	7.3	10.69	337	26.51		
1113	19.44	220	4.32	112	5.1	2.53	345	24.61		
1118	19.56	220	4.25	111	3.7	3.15	350	24.55		
1123	19.58	220	4.23	111	3.6	3.20	355	24.53		

Total volume purged	
Sample appearance	clear
Sample time	1126
Sample date	6/26/23

Facility Name	Pixley
Sample by	N. Hamilton

Depth to water, feet (TOC)	19.95
Measured Total Depth, feet (TOC)	27.15

Sample Location ID	AD-30
Depth to water date	6-26-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1041	20.16	220	4.43	473	46.3	0.55	334	25.16		
1046	20.15	220	4.84	428	34.5	0.86	301	27.85		
1051	20.16	220	4.95	425	13.3	0.82	300	27.02		
1056	20.16	220	4.97	424	8.5	0.81	298	26.85		
1101	20.16	220	4.98	423	8.3	0.75	298	26.79		

Total volume purged	
Sample appearance	Clear
Sample time	1103
Sample date	6-26-23

Facility Name	Pixley
Sample by	M. Hamilton

Depth to water, feet (TOC)	20.29
Measured Total Depth, feet (TOC)	37.32

Sample Location ID	AD-31
Depth to water date	6-26-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
939	20.60	220	3.64	285	50.7	5.43	274	26.57		
944	20.66	220	4.01	208	34.3	3.42	296	25.62		
945	20.71	220	4.12	291	15.5	4.90	307	25.30		
954	20.73	220	4.19	296	16.2	4.75	313	25.15		
959	20.74	220	4.20	299	16.2	4.71	316	25.13		

Total volume purged	
Sample appearance	clear
Sample time	1001
Sample date	6-26-23

Facility Name	AEP Pirkey
Sample by	Brad Bates

Sample Location ID	AD-32
Depth to water date	6/26/23

Depth to water, feet (TOC)	15.82
Measured Total Depth, feet (TOC)	34.65

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0906	16.38	220	3.82	295	112	6.17	307	26.65		
0911	16.49	220	3.71	302	69.5	1.87	281	25.53		
0916	16.53	220	3.74	305	31.0	1.14	256	25.40		
0921	16.55	220	3.81	306	9.9	0.85	243	25.34		
0926	16.56	220	3.79	304	9.8	0.83	240	25.32		

Total volume purged	
Sample appearance	clear
Sample time	0930
Sample date	6/26/23

Facility Name	HEP PINON PP
Sample by	Kerry McDonald

Sample Location ID	MW-33

Depth to water, feet (TOC)	12.56
Measured Total Depth, feet (TOC)	32.50

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0917	12.60	180	4.15	245	2.6	3.26	276	24.21		
0922	12.61	180	4.11	206	2.4	2.95	264	24.16		
0927	12.61	180	4.80	204	2.4	2.91	260	24.08		
0932	12.63	180	4.08	201	2.4	2.87	258	24.02		

Total volume purged	
Sample appearance	Clear
Sample time	0934
Sample date	06/26/23

Facility Name	AEP Pinkey
Sample by	BOB

Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	26.05

Sample Location ID	AP-34
Depth to water date	6/27/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0820	0.54	124	3.78	1800	6.8	2.96	96	24.33		
0825	0.62	124	3.72	1790	6.4	2.88	102	24.16		
0830	0.76	124	3.69	1788	6.0	2.72	104	24.08		
0835	0.84	124	3.67	1784	5.8	2.60	110	24.24		

Total volume purged	
Sample appearance	clear
Sample time	0839
Sample date	6/27/23

Facility Name	AEP Pirkey
Sample by	BCM

Sample Location ID	AD-36
Depth to water date	6/27/23

Depth to water, feet (TOC)	9.21
Measured Total Depth, feet (TOC)	17.10

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0918	9.72	150	3.94	84	30.4	9.56	207	28.07		
0923	9.80	150	3.98	74	8.9	1.53	217	26.91		
0928	9.84	150	4.00	73	2.8	0.78	223	26.94		
0933	9.86	150	4.01	74	2.7	0.70	225	26.90		

Total volume purged	
Sample appearance	clear
Sample time	0936
Sample date	6/27/23

Facility Name	Pirkey
Sample by	Hunt / Hamilton

Depth to water, feet (TOC)	18.05
Measured Total Depth, feet (TOC)	51.44

Sample Location ID	B-2
Depth to water date	6-26-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
821	18.51	300	5.26	94	9.8	6.16	330	24.58		
826	18.62	300	5.58	93	0	5.30	327	22.53		
831	18.66	300	5.63	93	0	5.24	315	23.57		

Total volume purged	
Sample appearance	Clear
Sample time	833
Sample date	6-26-23

Duplicate
1245

Facility Name	ATP PIPER PP
Sample by	KENNY McDonald

Sample Location ID	B-3

Depth to water, feet (TOC)	14.60
Measured Total Depth, feet (TOC)	37.49

Depth to water date	06/26/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1114	15.51	104	5.38	256	18.2	2.61	229	25.21		
1119	16.30	104	5.45	252	16.1	2.28	204	25.21		
				WOPIT HOLD WATER LOOP						

Total volume purged	
Sample appearance	Clear
Sample time	0700
Sample date	06/27/23

Facility Name	AEP Pirkey PP
Sample by	Brad Bates

Sample Location ID	AD-02

Depth to water, feet (TOC)	17.45
Measured Total Depth, feet (TOC)	40.36

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
946	17.72	200	3.78	734	0.8	1.78	368	24.02		
951	17.73	200	3.80	741	0	1.69	368	24.06		
956	17.75	200	3.79	744	0	1.66	364	24.13		
1001	17.75	200	3.77	745	0.3	1.64	368	24.18		

Total volume purged	
Sample appearance	Clear
Sample time	1003
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AD-04

Depth to water, feet (TOC)	19.54
Measured Total Depth, feet (TOC)	47.29

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
711	19.57	160	4.63	88	51.3	3.24	382	22.97		
716	19.58	160	4.62	89	50.6	2.89	380	23.01		
721	19.58	160	4.62	90	48.2	2.85	377	23.04		
726	19.58	160	4.61	91	52.3	2.81	384	23.10		

Total volume purged	
Sample appearance	Turbid
Sample time	728
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AD-12

Depth to water, feet (TOC)	19.52
Measured Total Depth, feet (TOC)	52.00

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
829	19.63	290	3.89	71	2.4	4.23	304	22.98		
834	19.66	290	3.88	68	0.0	4.19	311	22.87		
839	19.68	290	3.88	63	0.0	4.16	313	22.84		
844	19.71	290	3.84	63	0.0	4.11	317	22.82		

Total volume purged	
Sample appearance	Clear
Sample time	846
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AD-18

Depth to water, feet (TOC)	9.25
Measured Total Depth, feet (TOC)	28.42

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
808	10.13	104	4.41	48	11.4	2.68	311	24.21		
813	11.24	104	4.37	48	6.3	2.31	304	24.36		
			Won't hold water level							

Total volume purged	
Sample appearance	Clear
Sample time	950
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Brad Bates

Sample Location ID	AD-23

Depth to water, feet (TOC)	29.71
Measured Total Depth, feet (TOC)	38.50

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
811	30.02	200	4.51	97	11.2	6.85	254	24.08		
816	30.02	200	4.47	94	6.4	4.01	241	23.84		
821	30.04	200	4.46	90	3.4	3.22	237	23.67		
826	30.05	200	4.41	88	3.9	2.97	233	23.65		
831	30.05	200	4.40	88	3.6	2.95	231	23.61		
836	30.08	200	4.40	86	3.3	2.96	229	23.58		

Total volume purged	
Sample appearance	Clear
Sample time	838
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AD-31

Depth to water, feet (TOC)	23.01
Measured Total Depth, feet (TOC)	37.32

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
906	23.58	240	4.03	294	16.4	2.81	301	24.13		
911	23.61	240	4.03	302	15.8	2.54	306	24.17		
916	23.64	240	4.00	308	15.6	2.53	314	24.12		
921	23.65	240	4.01	311	15.6	2.51	320	24.08		

Total volume purged	
Sample appearance	Clear
Sample time	923
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Brad Bates

Sample Location ID	AD-32

Depth to water, feet (TOC)	17.72
Measured Total Depth, feet (TOC)	34.61

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
904	18.24	200	3.65	341	21.6	2.41	274	23.84		
909	18.26	200	3.62	338	10.2	1.05	269	23.81		
914	18.27	200	3.61	335	9.8	1.03	262	23.74		
919	18.29	200	3.61	330	9.6	1.03	258	23.76		

Total volume purged	
Sample appearance	Clear
Sample time	921
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Brad Bates

Sample Location ID	AD-34

Depth to water, feet (TOC)	Top of Casing
Measured Total Depth, feet (TOC)	26.05

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
728	0.36	120	3.80	1,760	3.6	2.34	147	24.28		
733	0.41	120	3.77	1,740	2.1	2.06	154	24.19		
738	0.48	120	3.77	1740	2.4	2.01	159	24.17		
743	0.52	120	3.77	1720	2.2	1.99	163	24.13		

Total volume purged	
Sample appearance	Clear
Sample time	745
Sample date	8/23/2023

Facility Name	AEP Pirkey PP
Sample by	Brad Bates

Sample Location ID	AD-36

Depth to water, feet (TOC)	6.29
Measured Total Depth, feet (TOC)	17.10

Depth to water date	8/23/2023

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
649	6.35	150	4.28	92	22.7	2.13	197	24.13		
654	6.41	150	4.26	89	6.4	0.97	206	24.16		
659	6.46	150	4.26	86	5.8	0.86	211	24.19		
704	6.49	150	4.23	84	5.2	0.77	213	24.22		

Total volume purged	
Sample appearance	Clear
Sample time	706
Sample date	8/23/2023

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey

Sampling Period: Oct 2023

Sampling Contractor: Esk

Signature: [signature]

Well No.	Well Locked	Fastener and Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Protective Cover, Barriers and Pad in Good Shape	Well Properly Labeled	Well Cap Present and Vented*	Comments
B-2	✓	✓	✓	✓	✓	✓	✓	
AD-12	✓	✓	✓	✓	✓	✓	✓	
AD-3c	✓	✓	✓	✓	✓	✓	✓	
AD-28	✓	✓	✓	✓	✓	✓	✓	
AD-17	✓	✓	✓	✓	✓	✓	✓	
AD-23	✓	✓	✓	✓	✓	✓	✓	
AD-20	✓	✓	✓	✓	✓	✓	✓	
AD-26	✓	✓	✓	✓	✓	✓	✓	
AD-27	✓	✓	✓	✓	✓	✓	✓	
AD-3	✓	✓	✓	✓	✓	✓	✓	

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP Pirkm PP

Sampling Period: October 2023

Sampling Contractor: EAGLE

Signature: [signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AD-7R	✓	✓	✓	✓	✓		✓	NO LABEL
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓		✓	NO LABEL
AD-34	✓	✓	✓	✓	✓	✓	✓	
AD-36	✓	✓	✓	✓	✓	✓	✓	
AD-8	✓	✓	✓	✓	✓	✓	✓	
AD-16	✓	✓	✓	✓	✓	✓	✓	

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

Facility Name	Pixley
Sample by	M+t Hamilton

Depth to water, feet (TOC)	37.23
Measured Total Depth, feet (TOC)	57.49

Sample Location ID	AD-3
Depth to water date	10-18-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1123	37.51	220	4.42	156	118	7.76	285	23.28		
1130	37.64	220	4.77	131	88.3	1.29	229	21.92		
1135	37.75	220	4.75	126	35.7	0.78	24	21.54		
1140	37.86	220	4.76	124	29.8	0.70	191	21.42		
1145	37.94	220	4.77	121	24.5	0.67	185	21.37		

Total volume purged	
Sample appearance	clear
Sample time	1147
Sample date	10-18-23

Facility Name	AEP PINEM PP
Sample by	Kenny McDonald

Sample Location ID	AD-7R

Depth to water, feet (TOC)	12.00
Measured Total Depth, feet (TOC)	33.03

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0851	12.55	240	5.59	128	3.7	2.27	148	16.84		
0856	12.58	240	5.60	107	1.2	1.53	158			
0901	12.60	240	5.61	104	0.7	1.48	164	17.16		
0906	12.61	240	5.61	105	0.9	1.46	174	17.21		

Total volume purged	
Sample appearance	Clear
Sample time	0908
Sample date	10/17/23

DUPLICATE A 1406

Facility Name	AFP Pinney PP
Sample by	Kenny McDermand

Sample Location ID	AO-8

Depth to water, feet (TOC)	14.77
Measured Total Depth, feet (TOC)	31.33

Depth to water date	10/18/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1037	14.91	200	4.34	312	16.3	4.16	290	23.13		
1042	14.92	200	4.26	319	5.4	2.23	286	23.50		
1047	14.92	200	4.24	323	6.2	2.18	280	23.49		
1052	14.94	200	4.21	326	5.7	2.09	277	23.49		

Total volume purged	
Sample appearance	Clear
Sample time	1054
Sample date	10/18/23

Facility Name	Pillen
Sample by	Matt Hamilton

Depth to water, feet (TOC)	21.70
Measured Total Depth, feet (TOC)	52.00

Sample Location ID	AD-12
Depth to water date	10-17-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
924	22.01	300	3.64	53	48.5	7.06	294	18.41		
929	22.06	300	3.77	54	11.2	2.18	305	20.44		
934	22.17	300	3.82	54	5.3	2.10	310	21.17		
939	22.28	300	3.84	55	5.3	2.07	313	21.26		

Total volume purged	
Sample appearance	Clear
Sample time	941
Sample date	10-17-23

Facility Name	AEP Pirkey PP
Sample by	Kenny McPherson

Sample Location ID	AD-13

Depth to water, feet (TOC)	15.91
Measured Total Depth, feet (TOC)	40.70

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0749	16.03	170	5.22	434	57.2	3.68	78	15.21		
0754	16.10	170	5.42	436	32.6	2.17	72	18.36		
0759	16.14	170	5.45	430	31.5	2.11	71	19.45		
0804	16.19	170	5.47	439	24.8	2.08	69	19.71		
0809	16.21	170	5.47	439	27.3	2.05	68	19.79		

Total volume purged	
Sample appearance	Clear
Sample time	0811
Sample date	10/17/23

Facility Name	AFP Pinnacle
Sample by	Kenny McDonald

Sample Location ID	AO-16

Depth to water, feet (TOC)	20.60
Measured Total Depth, feet (TOC)	38.24

Depth to water date	10/18/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity - (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1125	20.97	192	4.20	125	5.3	3.24	282	21.49		
1130	21.03	192	4.24	121	5.9	2.71	276	21.62		
1135	21.15	192	4.21	121	5.1	2.68	274	21.62		
1140	21.35	192	4.20	121	5.5	2.63	273	21.60		

Total volume purged	
Sample appearance	Clear
Sample time	1142
Sample date	10/18/23

Facility Name	Pixley
Sample by	Matt Hamilton

Depth to water, feet (TOC)	23.16
Measured Total Depth, feet (TOC)	33.05

Sample Location ID	AD-17
Depth to water date	10-17-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1154	23.28	200	3.16	114	17.7	5.52	412	23.14		
1159	23.34	200	3.24	135	9.8	1.33	415	24.00		
1204	23.37	200	3.16	145	5.9	1.39	417	23.96		
1209	23.40	200	3.14	149	6.0	1.42	418	23.99		

Total volume purged	
Sample appearance	clear
Sample time	1211
Sample date	10-17-23

Facility Name	AEP Pinnacle PP
Sample by	Kerry McDonald

Sample Location ID	AO-18

Depth to water, feet (TOC)	10.62
Measured Total Depth, feet (TOC)	28.42

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1148	12.06	110	3.83	55	3.8	1.83	356	21.29		
1153	13.13	110	3.86	64	2.4	1.64	368	21.34		
			WOMIT HOLD WATER KML							

Total volume purged	
Sample appearance	Clear
Sample time	0747
Sample date	10/18/23

Facility Name	AEP PIRKM PP
Sample by	KENNY McDONALD

Sample Location ID	AD-22

Depth to water, feet (TOC)	13.81
Measured Total Depth, feet (TOC)	32.70

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0958	11.57	150	3.96	737	2.4	4.02	272	21.36		
1003	11.57	150	4.00	740	0.0	3.56	272	21.32		
1008	11.58	150	4.01	743	0.0	3.54	274	21.30		
1013	11.60	150	4.00	750	0.0	3.53	267	21.29		

Total volume purged	
Sample appearance	CLEAR
Sample time	1015
Sample date	10/17/23

Facility Name	Pixley
Sample by	Matt Hamilton

Sample Location ID	AD-23

Depth to water, feet (TOC)	29.75
Measured Total Depth, feet (TOC)	38.20

Depth to water date	10-18-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
828	30.01	220	4.34	82	18.2	9.34	436	14.18		
833	30.01	220	3.84	74	77.7	4.02	461	17.33		
838	30.01	220	3.90	73	28.2	2.72	457	16.60		
843	30.01	220	3.95	74	29.1	2.69	455	16.72		

Total volume purged	
Sample appearance	clear
Sample time	845
Sample date	10-18-23

Facility Name	Pitney
Sample by	M.H. Hewitt

Depth to water, feet (TOC)	11.16
Measured Total Depth, feet (TOC)	27.38

Sample Location ID	MD-25
Depth to water date	10-18-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
918	11.52	125	3.86	909	54.3	5.87	256	19.11		
921	11.61	125	3.93	923	46.9	1.02	211	22.02		
926	11.68	125	4.25	944	35.2	1.05	202	22.48		
931	11.75	125	4.29	957	35.9	1.13	195	22.73		
936	11.82	125	4.31	968	34.9	1.16	190	22.86		

Total volume purged	
Sample appearance	clear
Sample time	938
Sample date	10-18-23

Facility Name	Pitsco
Sample by	M.H / Hamill

Depth to water, feet (TOC)	16.30
Measured Total Depth, feet (TOC)	42.73

Sample Location ID	AD-26
Depth to water date	10-18-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1002	16.61	300	3.30	2,060	77.3	2.42	278	21.35		
1007	16.97	300	3.31	2,180	42.9	0.79	263	21.84		
1012	17.11	300	3.33	2,100	33.6	0.55	254	22.11		
1017	17.15	300	3.34	2,110	33.6	0.51	251	22.15		

Total volume purged	
Sample appearance	clear
Sample time	1019
Sample date	10-18-23

Facility Name	Pillsbury
Sample by	Matt Hamilton

Depth to water, feet (TOC)	24.19
Measured Total Depth, feet (TOC)	40.07

Sample Location ID	AD-27
Depth to water date	10-18-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1034	24.47	300	3.48	271	18.5	5.86	268	22.51		
1044	24.55	300	3.45	236	10.2	0.13	287	22.36		
1054	24.61	300	3.44	236	7.4	0.85	303	22.37		
1059	24.69	300	3.43	234	7.2	0.81	310	22.39		

Total volume purged	
Sample appearance	Clear
Sample time	1101
Sample date	10-18-23

Facility Name	
Sample by	Pickey Matt / Hamilton

Depth to water, feet (TOC)	19.63
Measured Total Depth, feet (TOC)	38.54

Sample Location ID	AP-28
Depth to water date	10-17-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1102	19.96	220	3.81	101	43.4	6.37	350	22.40		
1107	20.11	220	3.56	96	9.1	2.15	358	21.52		
1112	20.18	220	3.52	97	5.2	2.14	361	21.37		

Total volume purged	
Sample appearance	Clear
Sample time	1114
Sample date	10-17-23

Facility Name	Pillsbury
Sample by	M. H. Smith

Depth to water, feet (TOC)	20.74
Measured Total Depth, feet (TOC)	27.15

Sample Location ID	AD-3a
Depth to water date	10.17.23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1017	21.22	220	5.21	530	24.5	6.51	220	21.63		
1022	21.32	220	4.39	428	10	1.20	178	23.20		
1027	21.42	220	4.23	443	9.2	0.66	216	23.63		
1032	21.46	220	4.18	446	9.4	0.95	226	23.81		

Total volume purged	
Sample appearance	clear
Sample time	1034
Sample date	10-17-23

Facility Name	AEP Pinnacle PP
Sample by	Kenny McDonald

Sample Location ID	AO-33

Depth to water, feet (TOC)	15.44
Measured Total Depth, feet (TOC)	32.50

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1048	15.56	220	4.27	217	1.8	3.28	282	22.10		
1053	15.56	220	4.20	171	0.9	2.24	302	22.18		
1058	15.57	220	4.04	170	1.1	2.15	309	22.22		
1103	15.57	220	3.97	172	1.0	2.15	312	22.24		
1108	15.58	220	3.95	177	0.6	2.13	315	22.29		

Total volume purged	
Sample appearance	Clear
Sample time	1110
Sample date	10/17/23

Facility Name	AFP Pitman PP
Sample by	Kim McDonald

Sample Location ID	AD-34

Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	

Depth to water date	10/18/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0904	0.64	120	3.30	1596	7.8	2.41	333	19.63		
0909	0.70	120	3.27	1640	8.7	2.30	331	20.03		
0914	0.73	120	3.27	1660	9.1	2.28	321	20.35		
0919	0.74	120	3.27	1660	8.2	2.28	315	20.38		

Total volume purged	
Sample appearance	Clear
Sample time	0921
Sample date	10/18/23

DUPLICATE-C 1400

Facility Name	AEP Pinnom PP
Sample by	Kenny McDonald

Sample Location ID	AD-36

Depth to water, feet (TOC)	8.72
Measured Total Depth, feet (TOC)	17.10

Depth to water date	10/18/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0951	8.91	120	4.16	119	7.2	6.21	288	20.87		
0956	8.89	110	4.19	87	3.6	4.86	279	20.68		
1001	8.88	110	4.19	81	2.9	4.83	273	20.20		
1006	8.89	110	4.19	80	3.1	4.80	270	20.71		

Total volume purged	
Sample appearance	clear
Sample time	1008
Sample date	10/18/23

Facility Name	Pickney
Sample by	M-H Hamilton

Depth to water, feet (TOC)	28.45
Measured Total Depth, feet (TOC)	51.44

Sample Location ID	B-2

Depth to water date	10-17-23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
819	28.88	300	4.37	175	85.8	9.38	187	15.01		
824	29.00	300	4.44	126	23.6	1.84	136	17.81		
829	29.05	300	4.56	124	14.8	1.16	108	18.46		
834	29.09	300	4.61	123	13.2	0.88	97	18.56		
839	29.11	300	4.66	122	8.8	0.81	90	18.65		
844	29.12	300	4.68	122	6.9	0.77	84	18.70		

Total volume purged	
Sample appearance	clear
Sample time	844
Sample date	10-17-23

Duplicate B

1315

Facility Name	AFP PIRNIM PP
Sample by	KENNY McDonald

Sample Location ID	B-3

Depth to water, feet (TOC)	17.67
Measured Total Depth, feet (TOC)	37.49

Depth to water date	10/17/23

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1211	18.72	102	4.80	226	8.4	2.41	368	22.41		
1216	19.63	102	4.91	209	6.3	2.30	288	21.93		
				WON'T HOLD WATER LEVEL						

Total volume purged	
Sample appearance	CLEAR
Sample time	0814
Sample date	10/18/23

APPENDIX 5- Analytical Laboratory Reports

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230702 **Customer: Pirkey Power Station** **Date Reported: 04/06/2023**

Customer Sample ID: AD-23
Customer Description:
Lab Number: 230702-001
Preparation:
Date Collected: 02/28/2023 12:05 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.049	mg/L	1	0.050	0.009	J1	GES	03/08/2023 19:48	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34
Customer Description:
Lab Number: 230702-002
Preparation:
Date Collected: 02/28/2023 12:13 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	41.9	mg/L	1	0.05	0.02		GES	03/08/2023 20:03	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: DUPLICATE AD-34
Customer Description:
Lab Number: 230702-003
Preparation:
Date Collected: 02/28/2023 12:13 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	40.8	mg/L	1	0.05	0.02		GES	03/08/2023 20:08	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: EQUIPMENT BLANK
Customer Description:
Lab Number: 230702-004
Preparation:
Date Collected: 02/28/2023 11:35 EST
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.009	mg/L	1	0.050	0.009	J1	GES	03/08/2023 20:14	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	03/08/2023 20:14	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230702 **Customer: Pirkey Power Station** **Date Reported: 04/06/2023**

Customer Sample ID: FIELD BLANK
Lab Number: 230702-005
Date Collected: 02/28/2023 11:37 EST

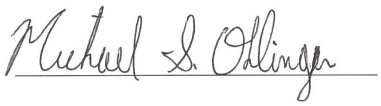
Customer Description:
Preparation:
Date Received: 03/06/2023 14:20 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	03/08/2023 20:19	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	03/08/2023 20:19	EPA 200.8-1994, Rev. 5.4

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - LF Resample
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 230702

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B	251 mL bottle, pH<2, HNO_3 Ca	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, and Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg		Sample Specific Notes:
AD-23	2/28/2023	1105	G	GW	1		X							
AD-34	2/28/2023	1113	G	GW	1			X						
DUPLICATE AD-34	2/28/2023	1113	G	GW	1			X						
EQUIPMENT BLANK	2/28/2023	1035	G	GW	1		X	X						
FIELD BLANK	2/28/2023	1037	G	GW	1		X	X						
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	4	1	4	2	2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: Matt Hamilton	Company: Eagle	Date/Time: 3-1-23 1500	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 3/6/23 2:20PM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 5

Opened By MSD / WLG / TTP **Number of Glass Containers:** -

Date/Time 3/6/23 2:20pm **Number of Mercury Containers:** -

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / (no ice)

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MGK / TTP / WLG

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ ~~(See Prep Book)~~

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 230702

Comments: _____

Logged by MSD _____

_____

Reviewed by _____

_____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230657 **Customer: Pirkey Power Station** **Date Reported: 03/29/2023**

Customer Sample ID: AD-34 Customer Description: TG-32
Lab Number: 230657-001 Preparation:
Date Collected: 03/01/2023 00:13 EST Date Received: 03/02/2023 10:30 EST

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1640	mg/L	1	50	20		SDW	03/03/2023 11:05	SM 2540C-2015

Customer Sample ID: AD-36 Customer Description: TG-32
Lab Number: 230657-002 Preparation:
Date Collected: 02/28/2023 11:23 EST Date Received: 03/02/2023 10:30 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	11.7	mg/L	2	0.04	0.02		CRJ	03/16/2023 12:37	EPA 300.1 -1997, Rev. 1.0

Customer Sample ID: DUPLICATE AD-34 Customer Description: TG-32
Lab Number: 230657-003 Preparation:
Date Collected: 03/01/2023 00:13 EST Date Received: 03/02/2023 10:30 EST

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1660	mg/L	1	50	20		SDW	03/03/2023 11:13	SM 2540C-2015

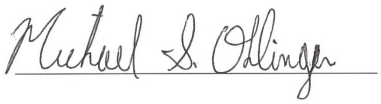
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230657 **Customer: Pirkey Power Station** **Date Reported: 03/29/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - AD-34

Contact Name: Leslie Fuerschbach

Contact Phone: 318-423-3805

Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 230657

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg,	1 L bottle, Cool, 0-6°C Chloride	1 L bottle, Cool, 0-6°C TDS	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg		Sample Specific Notes:
AD-34	2/28/2023	1113	G	GW	1				X					
AD-36	2/28/2023	1023	G	GW	1			X						
DUPLICATE AD-34	2/28/2023	1113	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	1	1	4	2	2		

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Matt Hamilton	Eagle	3-1-23 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 3/2/23 10:30 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pirkee Power Station **Number of Plastic Containers:** 3

Opened By Michael **Number of Glass Containers:** _____

Date/Time 03/02/23 10:30Am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MGC (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 28 days If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MGC 03/02/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 230657 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

_____

Reviewed by MGC _____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Timothy Arnold		Chemist Principal	3/17/2023
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Timothy Arnold

LRC Date: 3/17/2023

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303127

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Timothy Arnold

LRC Date: 3/17/2023

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303127

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Timothy Arnold

LRC Date: 3/17/2023

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303127

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger	Michael Ohlinger	Chemist	3/29/13
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey AD-34

Reviewer Name: Michael Ohlinger

LRC Date: 3/29/23

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303072

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey AD-34

Reviewer Name: Michael Ohlinger

LRC Date: 3/29/23

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303072

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey AD-34

Reviewer Name: Michael Ohlinger

LRC Date: 3/29/23

Laboratory Job Number: 230657

Prep Batch Number(s): QC2303072

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231989 **Customer: Pirkey Power Station** **Date Reported: 08/04/2023**

Customer Sample ID: AD-8
Customer Description: TG-32
Lab Number: 231989-001
Preparation:
Date Collected: 06/27/2023 11:24 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.994	mg/L	1	0.050	0.007		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4
Calcium	92.7	mg/L	1	0.05	0.01		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4
Magnesium	6.68	mg/L	1	0.100	0.006		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4
Potassium	0.862	mg/L	1	0.100	0.008		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4
Sodium	7.24	mg/L	1	0.20	0.01		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4
Strontium	0.547	mg/L	1	0.00200	0.00005		GES	07/06/2023 11:45	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-16
Customer Description: TG-32
Lab Number: 231989-002
Preparation:
Date Collected: 06/27/2023 09:59 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.016	mg/L	1	0.050	0.007	J1	GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4
Calcium	0.79	mg/L	1	0.05	0.01		GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4
Magnesium	1.74	mg/L	1	0.100	0.006		GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4
Potassium	0.932	mg/L	1	0.100	0.008		GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4
Sodium	15.0	mg/L	1	0.20	0.01		GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4
Strontium	0.0114	mg/L	1	0.00200	0.00005		GES	07/06/2023 12:54	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-23
Customer Description: TG-32
Lab Number: 231989-003
Preparation:
Date Collected: 06/27/2023 11:06 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.061	mg/L	1	0.050	0.007		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4
Calcium	0.44	mg/L	1	0.05	0.01		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4
Magnesium	0.296	mg/L	1	0.100	0.006		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4
Potassium	3.46	mg/L	1	0.100	0.008		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4
Sodium	2.73	mg/L	1	0.20	0.01		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4
Strontium	0.00375	mg/L	1	0.00200	0.00005		GES	07/06/2023 14:27	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231989 **Customer: Pirkey Power Station** **Date Reported: 08/04/2023**

Customer Sample ID: AD-27 Customer Description: TG-32
Lab Number: 231989-004 Preparation:
Date Collected: 06/27/2023 09:30 EDT Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.032	mg/L	1	0.050	0.007	J1	GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4
Calcium	3.86	mg/L	1	0.05	0.01		GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4
Magnesium	4.89	mg/L	1	0.100	0.006		GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4
Potassium	1.99	mg/L	1	0.100	0.008		GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4
Sodium	8.15	mg/L	1	0.20	0.01		GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4
Strontium	0.0587	mg/L	1	0.00200	0.00005		GES	07/06/2023 14:32	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34 Customer Description: TG-32
Lab Number: 231989-005 Preparation:
Date Collected: 06/27/2023 09:39 EDT Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.057	mg/L	1	0.050	0.007		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4
Calcium	40.1	mg/L	1	0.05	0.01		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4
Magnesium	36.0	mg/L	1	0.100	0.006		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4
Potassium	7.10	mg/L	1	0.100	0.008		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4
Sodium	14.0	mg/L	1	0.20	0.01		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4
Strontium	0.446	mg/L	1	0.00200	0.00005		GES	07/06/2023 14:38	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-36 Customer Description: TG-32
Lab Number: 231989-006 Preparation:
Date Collected: 06/27/2023 10:36 EDT Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.067	mg/L	1	0.050	0.007		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4
Calcium	0.88	mg/L	1	0.05	0.01		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4
Magnesium	1.78	mg/L	1	0.100	0.006		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4
Potassium	1.61	mg/L	1	0.100	0.008		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4
Sodium	5.13	mg/L	1	0.20	0.01		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4
Strontium	0.00953	mg/L	1	0.00200	0.00005		GES	07/06/2023 14:43	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231989 **Customer: Pirkey Power Station** **Date Reported: 08/04/2023**

Customer Sample ID: Landfill Duplicate
Customer Description: TG-32
Lab Number: 231989-007
Preparation:
Date Collected: 06/27/2023 10:00 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.960	mg/L	1	0.050	0.007		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4
Calcium	93.4	mg/L	1	0.05	0.01		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4
Magnesium	6.75	mg/L	1	0.100	0.006		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4
Potassium	0.847	mg/L	1	0.100	0.008		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4
Sodium	7.19	mg/L	1	0.20	0.01		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4
Strontium	0.557	mg/L	1	0.00200	0.00005		GES	07/06/2023 14:48	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: Equipment Blank - Landfill
Customer Description: TG-32
Lab Number: 231989-008
Preparation:
Date Collected: 06/27/2023 10:37 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	07/06/2023 14:53	EPA 200.8-1994, Rev. 5.4

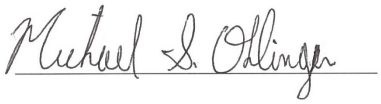
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231989 **Customer: Pirkey Power Station** **Date Reported: 08/04/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR-Landfill
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231989

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3	Field-filter 250 mL bottle, then pH<2, HNO_3	Three (six every 10th*) 1 L bottles, pH<2, HNO3	125 mL PTFE lined bottle, HCL**, pH<2	Field Filtered 125 mL PTFE lined bottle, HCL**, pH<2			Sample Specific Notes:
							B, Ca, K, Mg, Na, Sr	Dissolved B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	Ra-226, Ra-228	Mercury	Dissolved Mercury			
AD-8	6/27/2023	1024	G	GW	1		X							
AD-16	6/27/2023	859	G	GW	1		X							
AD-23	6/27/2023	1006	G	GW	1		X							
AD-27	6/27/2023	830	G	GW	1		X							
AD-34	6/27/2023	839	G	GW	1		X							
AD-36	6/27/2023	936	G	GW	1		X							
Landfill Duplicate	6/27/2023	900	G	GW	1		X							
Equipment Blank - Landfill	6/27/2023	937	G	GW	1		X							
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	2			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company: Eqk	Date/Time: 6-28-23 1600	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 6/30/23 11:30 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 8

Opened By MGK / WCG **Number of Glass Containers:** —

Date/Time 6/30/23 11:30Am **Number of Mercury Containers:** —

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) N Comments _____

Were samples labeled properly? (Y) N Comments _____

Were correct containers used? (Y) N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** WCG 6/30/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT# _____ (OR) Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 231989

Comments: _____

Logged by MSD

Reviewed by WCG

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [●] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	08/03/2023
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231989

Prep Batch Number(s): PB23070303 QC2307047

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231989

Prep Batch Number(s): PB23070303 QC2307047

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231989

Prep Batch Number(s): PB23070303 QC2307047

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is CCB<2.2*MDL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231962 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-8
Customer Description: TG-32
Lab Number: 231962-001
Preparation:
Date Collected: 06/27/2023 11:24 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.24	mg/L	2	0.10	0.02		CRJ	07/15/2023 01:04	EPA 300.1 -1997, Rev. 1.0
Chloride	6.97	mg/L	2	0.04	0.01		CRJ	07/15/2023 01:04	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.31	mg/L	2	0.06	0.02		CRJ	07/15/2023 01:04	EPA 300.1 -1997, Rev. 1.0
Sulfate	182	mg/L	10	3.0	0.6		CRJ	07/15/2023 00:31	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	87	mg/L	1	20	5		MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	410	mg/L	1	50	20		JAB	06/30/2023 15:25	SM 2540C-2015

Customer Sample ID: AD-16
Customer Description: TG-32
Lab Number: 231962-002
Preparation:
Date Collected: 06/27/2023 09:59 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.15	mg/L	2	0.10	0.02		CRJ	07/15/2023 02:10	EPA 300.1 -1997, Rev. 1.0
Chloride	28.9	mg/L	2	0.04	0.01		CRJ	07/15/2023 02:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	07/15/2023 02:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.3	mg/L	2	0.6	0.1		CRJ	07/15/2023 02:10	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	120	mg/L	1	50	20		JAB	06/30/2023 15:26	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231962 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-23
Customer Description: TG-32
Lab Number: 231962-003
Preparation:
Date Collected: 06/27/2023 11:06 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.16	mg/L	2	0.10	0.02		CRJ	07/15/2023 02:43	EPA 300.1 -1997, Rev. 1.0
Chloride	7.55	mg/L	2	0.04	0.01		CRJ	07/15/2023 02:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.04	mg/L	2	0.06	0.02	J1	CRJ	07/15/2023 02:43	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.7	mg/L	2	0.6	0.1		CRJ	07/15/2023 02:43	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	70	mg/L	1	50	20		JAB	06/30/2023 15:27	SM 2540C-2015

Customer Sample ID: AD-27
Customer Description: TG-32
Lab Number: 231962-004
Preparation:
Date Collected: 06/27/2023 09:30 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.30	mg/L	2	0.10	0.02		CRJ	07/15/2023 03:16	EPA 300.1 -1997, Rev. 1.0
Chloride	13.6	mg/L	2	0.04	0.01		CRJ	07/15/2023 03:16	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.14	mg/L	2	0.06	0.02		CRJ	07/15/2023 03:16	EPA 300.1 -1997, Rev. 1.0
Sulfate	59.9	mg/L	2	0.6	0.1		CRJ	07/15/2023 03:16	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	210	mg/L	1	50	20		JAB	06/30/2023 15:36	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231962 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-34 Customer Description: TG-32
Lab Number: 231962-005 Preparation:
Date Collected: 06/27/2023 09:39 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.14	mg/L	5	0.25	0.05	J1	CRJ	07/15/2023 04:54	EPA 300.1 -1997, Rev. 1.0
Chloride	7.18	mg/L	5	0.10	0.03		CRJ	07/15/2023 04:54	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.63	mg/L	5	0.15	0.05		CRJ	07/15/2023 04:54	EPA 300.1 -1997, Rev. 1.0
Sulfate	1230	mg/L	50	15	3		CRJ	07/15/2023 04:21	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	1710	mg/L	1	50	20		JAB	06/30/2023 15:37	SM 2540C-2015

Customer Sample ID: AD-36 Customer Description: TG-32
Lab Number: 231962-006 Preparation:
Date Collected: 06/27/2023 10:36 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.35	mg/L	2	0.10	0.02		CRJ	07/15/2023 06:00	EPA 300.1 -1997, Rev. 1.0
Chloride	11.1	mg/L	2	0.04	0.01		CRJ	07/15/2023 06:00	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	07/15/2023 06:00	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.6	mg/L	2	0.6	0.1		CRJ	07/15/2023 06:00	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20	P1	JAB	06/30/2023 15:38	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231962 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: Landfill Duplicate
Customer Description: TG-32
Lab Number: 231962-007
Preparation:
Date Collected: 06/27/2023 10:00 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

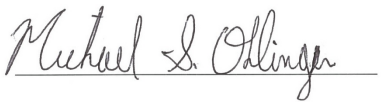
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.24	mg/L	2	0.10	0.02		CRJ	07/14/2023 14:49	EPA 300.1 -1997, Rev. 1.0
Chloride	6.96	mg/L	2	0.04	0.01		CRJ	07/14/2023 14:49	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.32	mg/L	2	0.06	0.02		CRJ	07/14/2023 14:49	EPA 300.1 -1997, Rev. 1.0
Sulfate	183	mg/L	10	3.0	0.6		CRJ	07/14/2023 23:58	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	85	mg/L	1	20	5		MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	420	mg/L	2	100	40		JAB	06/30/2023 15:47	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231962 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Data Qualifer Legend

U1 - Not detected at or above method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

P1 - The precision between duplicate results was above acceptance limits.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR - Landfill
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231962

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury (250 mL bottle, pH<2, HNO3)	Dissolved Mercury (Field-filter 250 mL bottle, then pH<2, HNO3)	F, Cl, SO4, Br, TDS, Alkalinity (1 L bottle, Cool, 0-6C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO3)				Sample Specific Notes
AD-8	6/27/2023	1024	G	GW	1				X					
AD-16	6/27/2023	859	G	GW	1				X					
AD-23	6/27/2023	1006	G	GW	1				X					
AD-27	6/27/2023	830	G	GW	1				X					
AD-34	6/27/2023	839	G	GW	1				X					
AD-36	6/27/2023	936	G	GW	1				X					
Landfill Duplicate	6/27/2023	900	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eqx	6-28-23 16oc		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 6/29/23 10:45 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pitkey PP **Number of Plastic Containers:** 7

Opened By Misha/Michael **Number of Glass Containers:** _____

Date/Time 06/29/23 10:45Am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MGK (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) N or N/A **Initial & Date:** MGK 06/29/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# XP00RWD021 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 231962 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

Reviewed by JAB _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger	Michael Ohlinger	Chemist	8/1/2023
Name (printed)	Signature	Official Title	Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306250

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306250

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306250

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

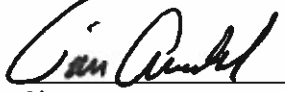
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold		Principle Chemist	7/17/23
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR Landfill

Reviewer Name: Tim Arnold

LRC Date: 7/17/23

Laboratory Job Number: 231962

Prep Batch Number(s): QC2307103

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR Landfill

Reviewer Name: Tim Arnold

LRC Date: 7/17/23

Laboratory Job Number: 231962

Prep Batch Number(s): QC2307103

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR Landfill

Reviewer Name: Tim Arnold

LRC Date: 7/17/23

Laboratory Job Number: 231962

Prep Batch Number(s): QC2307103

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

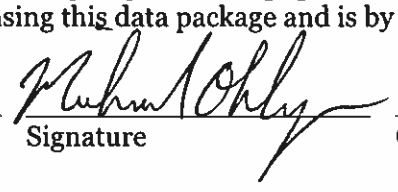
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger		Chemist	8/1/2023
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306244

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306244

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP CCR - Landfill

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231962

Prep Batch Number(s): QC2306244

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-2
Customer Description: TG-32
Lab Number: 231960-001
Preparation:
Date Collected: 06/26/2023 11:42 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.35	mg/L	2	0.10	0.02		CRJ	07/12/2023 11:48	EPA 300.1 -1997, Rev. 1.0
Chloride	30.8	mg/L	2	0.04	0.01		CRJ	07/12/2023 11:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.19	mg/L	2	0.06	0.02		CRJ	07/12/2023 11:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	271	mg/L	10	3.0	0.6		CRJ	07/12/2023 11:16	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	530	mg/L	1	50	20		JAB	06/30/2023 10:53	SM 2540C-2015

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 231960-002
Preparation:
Date Collected: 06/27/2023 12:01 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.06	mg/L	2	0.10	0.02	J1	CRJ	07/12/2023 14:33	EPA 300.1 -1997, Rev. 1.0
Chloride	5.67	mg/L	2	0.04	0.01		CRJ	07/12/2023 14:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.03	mg/L	2	0.06	0.02	J1	CRJ	07/12/2023 14:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	22.4	mg/L	2	0.6	0.1		CRJ	07/12/2023 14:33	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	150	mg/L	1	50	20		JAB	06/30/2023 10:56	SM 2540C-2015

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-4 Customer Description: TG-32
Lab Number: 231960-003 Preparation:
Date Collected: 06/27/2023 12:10 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.30	mg/L	2	0.10	0.02		CRJ	07/12/2023 15:06	EPA 300.1 -1997, Rev. 1.0
Chloride	3.97	mg/L	2	0.04	0.01		CRJ	07/12/2023 15:06	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.02	mg/L	2	0.06	0.02	J1	CRJ	07/12/2023 15:06	EPA 300.1 -1997, Rev. 1.0
Sulfate	18.9	mg/L	2	0.6	0.1		CRJ	07/12/2023 15:06	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	150	mg/L	1	50	20		JAB	06/30/2023 11:02	SM 2540C-2015

Customer Sample ID: AD-7 Customer Description: TG-32
Lab Number: 231960-004 Preparation:
Date Collected: 06/27/2023 10:51 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	2.85	mg/L	2	0.10	0.02		CRJ	07/12/2023 19:29	EPA 300.1 -1997, Rev. 1.0
Chloride	31.2	mg/L	2	0.04	0.01		CRJ	07/12/2023 19:29	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.40	mg/L	2	0.06	0.02		CRJ	07/12/2023 19:29	EPA 300.1 -1997, Rev. 1.0
Sulfate	74.6	mg/L	2	0.6	0.1		CRJ	07/12/2023 19:29	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	290	mg/L	1	50	20		JAB	06/30/2023 11:01	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-12
Customer Description: TG-32
Lab Number: 231960-005
Preparation:
Date Collected: 06/26/2023 08:55 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.05	mg/L	2	0.10	0.02	J1	CRJ	07/12/2023 18:23	EPA 300.1 -1997, Rev. 1.0
Chloride	4.68	mg/L	2	0.04	0.01		CRJ	07/12/2023 18:23	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	07/12/2023 18:23	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.9	mg/L	2	0.6	0.1		CRJ	07/12/2023 18:23	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	80	mg/L	1	50	20		JAB	06/30/2023 11:07	SM 2540C-2015

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 231960-006
Preparation:
Date Collected: 06/26/2023 08:28 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.25	mg/L	2	0.10	0.02		CRJ	07/12/2023 21:41	EPA 300.1 -1997, Rev. 1.0
Chloride	48.7	mg/L	10	0.20	0.05		CRJ	07/12/2023 21:08	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.23	mg/L	2	0.06	0.02		CRJ	07/12/2023 21:41	EPA 300.1 -1997, Rev. 1.0
Sulfate	112	mg/L	10	3.0	0.6		CRJ	07/12/2023 21:08	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	280	mg/L	1	50	20		JAB	06/30/2023 11:09	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 231960-007
Preparation:
Date Collected: 06/26/2023 12:47 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.16	mg/L	2	0.10	0.02		CRJ	07/12/2023 20:35	EPA 300.1 -1997, Rev. 1.0
Chloride	15.4	mg/L	2	0.04	0.01		CRJ	07/12/2023 20:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.19	mg/L	2	0.06	0.02		CRJ	07/12/2023 20:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.4	mg/L	2	0.6	0.1		CRJ	07/12/2023 20:35	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		JAB	06/30/2023 11:14	SM 2540C-2015

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 231960-008
Preparation:
Date Collected: 06/27/2023 08:42 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.04	mg/L	2	0.10	0.02	J1	CRJ	07/12/2023 22:47	EPA 300.1 -1997, Rev. 1.0
Chloride	5.28	mg/L	2	0.04	0.01		CRJ	07/12/2023 22:47	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	07/12/2023 22:47	EPA 300.1 -1997, Rev. 1.0
Sulfate	8.2	mg/L	2	0.6	0.1		CRJ	07/12/2023 22:47	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	110	mg/L	1	50	20		JAB	06/30/2023 11:16	SM 2540C-2015

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Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-22 Customer Description: TG-32
Lab Number: 231960-009 Preparation:
Date Collected: 06/26/2023 09:43 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.48	mg/L	2	0.10	0.02		CRJ	07/13/2023 03:10	EPA 300.1 -1997, Rev. 1.0
Chloride	93.9	mg/L	25	0.5	0.1		CRJ	07/13/2023 02:37	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.63	mg/L	2	0.06	0.02		CRJ	07/13/2023 03:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	350	mg/L	25	8	2		CRJ	07/13/2023 02:37	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	680	mg/L	1	50	20		JAB	06/30/2023 11:23	SM 2540C-2015

Customer Sample ID: AD-28 Customer Description: TG-32
Lab Number: 231960-010 Preparation:
Date Collected: 06/26/2023 12:26 EDT Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.06	mg/L	2	0.10	0.02	J1	CRJ	07/12/2023 23:20	EPA 300.1 -1997, Rev. 1.0
Chloride	4.14	mg/L	2	0.04	0.01		CRJ	07/12/2023 23:20	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.54	mg/L	2	0.06	0.02		CRJ	07/12/2023 23:20	EPA 300.1 -1997, Rev. 1.0
Sulfate	25.9	mg/L	2	0.6	0.1		CRJ	07/12/2023 23:20	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	120	mg/L	1	50	20		JAB	06/30/2023 11:24	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 231960-011
Preparation:
Date Collected: 06/26/2023 12:03 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.20	mg/L	2	0.10	0.02		CRJ	07/13/2023 05:22	EPA 300.1 -1997, Rev. 1.0
Chloride	18.2	mg/L	2	0.04	0.01		CRJ	07/13/2023 05:22	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.04	mg/L	2	0.06	0.02	J1	CRJ	07/13/2023 05:22	EPA 300.1 -1997, Rev. 1.0
Sulfate	147	mg/L	10	3.0	0.6		CRJ	07/13/2023 04:49	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	300	mg/L	1	50	20		JAB	06/30/2023 11:31	SM 2540C-2015

Customer Sample ID: AD-31
Customer Description: TG-32
Lab Number: 231960-012
Preparation:
Date Collected: 06/26/2023 11:01 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.26	mg/L	2	0.10	0.02		CRJ	07/13/2023 04:16	EPA 300.1 -1997, Rev. 1.0
Chloride	21.2	mg/L	2	0.04	0.01		CRJ	07/13/2023 04:16	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.1	mg/L	2	0.06	0.02		CRJ	07/13/2023 04:16	EPA 300.1 -1997, Rev. 1.0
Sulfate	82.1	mg/L	2	0.6	0.1		CRJ	07/13/2023 04:16	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	280	mg/L	1	50	20		JAB	06/30/2023 11:32	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: AD-32
Customer Description: TG-32
Lab Number: 231960-013
Preparation:
Date Collected: 06/26/2023 09:30 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.17	mg/L	2	0.10	0.02		CRJ	07/13/2023 07:01	EPA 300.1 -1997, Rev. 1.0
Chloride	14.5	mg/L	2	0.04	0.01		CRJ	07/13/2023 07:01	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.13	mg/L	2	0.06	0.02		CRJ	07/13/2023 07:01	EPA 300.1 -1997, Rev. 1.0
Sulfate	119	mg/L	25	8	2		CRJ	07/13/2023 06:28	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	260	mg/L	1	50	20		JAB	06/30/2023 11:37	SM 2540C-2015

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 231960-014
Preparation:
Date Collected: 06/26/2023 11:34 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.28	mg/L	2	0.10	0.02		CRJ	07/13/2023 08:07	EPA 300.1 -1997, Rev. 1.0
Chloride	9.50	mg/L	2	0.04	0.01		CRJ	07/13/2023 08:07	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.21	mg/L	2	0.06	0.02		CRJ	07/13/2023 08:07	EPA 300.1 -1997, Rev. 1.0
Sulfate	58.4	mg/L	2	0.6	0.1		CRJ	07/13/2023 08:07	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	200	mg/L	1	50	20		JAB	06/30/2023 11:38	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Customer Sample ID: Duplicate - 1
Customer Description: TG-32
Lab Number: 231960-015
Preparation:
Date Collected: 06/26/2023 13:00 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.25	mg/L	2	0.10	0.02		CRJ	07/12/2023 12:54	EPA 300.1 -1997, Rev. 1.0
Chloride	48.3	mg/L	10	0.20	0.05		CRJ	07/12/2023 10:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	2	0.06	0.02		CRJ	07/12/2023 12:54	EPA 300.1 -1997, Rev. 1.0
Sulfate	112	mg/L	10	3.0	0.6		CRJ	07/12/2023 10:43	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	300	mg/L	1	50	20		JAB	06/30/2023 11:51	SM 2540C-2015

Customer Sample ID: Field Blank
Customer Description: TG-32
Lab Number: 231960-016
Preparation:
Date Collected: 06/26/2023 12:25 EDT
Date Received: 06/29/2023 10:45 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	07/12/2023 10:10	EPA 300.1 -1997, Rev. 1.0
Chloride	0.27	mg/L	2	0.04	0.01		CRJ	07/12/2023 10:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	07/12/2023 10:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	<0.1	mg/L	2	0.6	0.1	U1	CRJ	07/12/2023 10:10	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	06/29/2023 14:54	SM 2320B-2011
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	JAB	06/30/2023 11:52	SM 2540C-2015

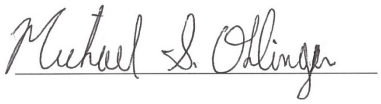
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231960 **Customer: Pirkey Power Station** **Date Reported: 08/01/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

U1 - Not detected at or above method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP Semi-Annual CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: | Date:

For Lab Use Only:
COC/Order #: 231960

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury (250 mL bottle, pH<2, HNO3)	Dissolved Mercury (Field-filter 250 mL bottle, then pH<2, HNO3)	F, Cl, SO4, Br, TDS, Alkalinity (1 L bottle, Cool, 0-6C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO3)				Sample Specific Notes
AD-2	6/26/2023	1042	G	GW	1				X					
AD-3	6/27/2023	1101	G	GW	1				X					
AD-4	6/27/2023	1110	G	GW	1				X					
AD-7	6/27/2023	951	G	GW	1				X					
AD-12	6/26/2023	755	G	GW	1				X					
AD-13	6/26/2023	728	G	GW	1				X					
AD-17	6/26/2023	1147	G	GW	1				X					
AD-18	6/27/2023	742	G	GW	1				X					
AD-22	6/26/2023	843	G	GW	1				X					
AD-28	6/26/2023	1126	G	GW	1				X					
AD-30	6/26/2023	1103	G	GW	1				X					
AD-31	6/26/2023	1001	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: [signature]	Company: Eagle	Date/Time: 1600 6-28-23	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 6/29/23 10:45AM

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury (250 mL bottle, pH<2, HNO3)	Dissolved Mercury (Field-filter 250 mL bottle, then pH<2, HNO3)	F, Cl, SO4, Br, TDS, Alkalinity (1 L bottle, Cool, 0-6C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO3)				Sample Specific Notes:
AD-32	6/26/2023	830	G	GW	1				X					
AD-33	6/23/2023	934	G	GW	1				X					
Duplicate - 1	6/26/2023	1200	G	GW	1				X					
Field Blank	6/26/2023	1125	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company: Eqk	Date/Time: 6-28-23 16a	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 6/29/23 10:45AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pitkey PP **Number of Plastic Containers:** 16

Opened By Misha/Michael **Number of Glass Containers:** _____

Date/Time 06/29/23 10:45AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MGC (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MGC 06/29/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X008RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 231960 Initial & Date & Time : _____

Logged by MSO

Reviewed by JMB

Comments: AD-33 listed as taken on 6/23 @ 9:34 on COC while on bottles as 6/26 @ 9:34. Work with bottle due to all other samples being taken 6/26 & 6/27. MSO 6/29/23

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger		Chemist	8/1/2023
Name (printed)	Signature	Official Title	Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306250

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306250

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306250

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold		Principle Chemist	07/13/23
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Tim Arnold

LRC Date: 7/13/23

Laboratory Job Number: 231960

Prep Batch Number(s): QC2307086

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Tim Arnold

LRC Date: 7/13/23

Laboratory Job Number: 231960

Prep Batch Number(s): QC2307086

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual CCR

Reviewer Name: Tim Arnold

LRC Date: 7/13/23

Laboratory Job Number: 231960

Prep Batch Number(s): QC2307086

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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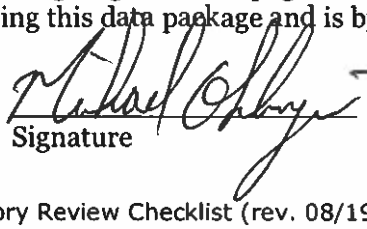
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger		Chemist	8/1/2023
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306244

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306244

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-Annual

Reviewer Name: Michael Ohlinger

LRC Date: 8/1/2023

Laboratory Job Number: 231960

Prep Batch Number(s): QC2306244

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-2
Customer Description: TG-32
Lab Number: 231985-001
Preparation:
Date Collected: 06/26/2023 11:42 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Arsenic	1.14	µg/L	1	0.10	0.03		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Barium	13.5	µg/L	1	0.20	0.05		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Beryllium	0.744	µg/L	1	0.050	0.007		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Boron	3.06	mg/L	1	0.050	0.007		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Cadmium	0.119	µg/L	1	0.020	0.004		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Calcium	3.53	mg/L	1	0.05	0.01		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Chromium	0.49	µg/L	1	0.30	0.07		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Cobalt	27.3	µg/L	1	0.020	0.005		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Lead	0.60	µg/L	1	0.20	0.05		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Lithium	0.0595	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Magnesium	7.46	mg/L	1	0.100	0.006		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Mercury	157	ng/L	2	10	4		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Potassium	1.38	mg/L	1	0.100	0.008		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Selenium	4.32	µg/L	1	0.50	0.04		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Sodium	108	mg/L	1	0.20	0.01		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Strontium	0.0540	mg/L	1	0.00200	0.00005		GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4
Thallium	0.11	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:33	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.49	pCi/L	0.11	0.14		TTP	07/11/2023 11:33	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.5	%						
Radium-228	0.87	pCi/L	0.16	0.50		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	80.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-2
Customer Description: TG-32
Lab Number: 231985-001-01
Preparation: Dissolved
Date Collected: 06/26/2023 11:42 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Arsenic	1.10	µg/L	1	0.10	0.03		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Barium	13.3	µg/L	1	0.20	0.05		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Beryllium	0.746	µg/L	1	0.050	0.007		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Cadmium	0.110	µg/L	1	0.020	0.004		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Chromium	0.59	µg/L	1	0.30	0.07		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Cobalt	27.4	µg/L	1	0.020	0.005		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Iron	0.229	mg/L	1	0.020	0.003		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Lead	0.61	µg/L	1	0.20	0.05		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Lithium	0.0599	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Manganese	0.102	mg/L	1	0.00100	0.00008		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Selenium	4.14	µg/L	1	0.50	0.04		GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4
Thallium	0.11	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:38	EPA 200.8-1994, Rev. 5.4

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 231985-002
Preparation:
Date Collected: 06/27/2023 12:01 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.011	µg/L	1	0.100	0.008	J1	GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.80	µg/L	1	0.10	0.03		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Barium	52.2	µg/L	1	0.20	0.05		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Beryllium	0.200	µg/L	1	0.050	0.007		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Boron	0.037	mg/L	1	0.050	0.007	J1	GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.020	µg/L	1	0.020	0.004		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Calcium	2.95	mg/L	1	0.05	0.01		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Cobalt	2.79	µg/L	1	0.020	0.005		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Lead	0.25	µg/L	1	0.20	0.05		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Lithium	0.0414	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Magnesium	1.42	mg/L	1	0.100	0.006		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Potassium	2.06	mg/L	1	0.100	0.008		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Selenium	0.04	µg/L	1	0.50	0.04	J1	GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Sodium	8.14	mg/L	1	0.20	0.01		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Strontium	0.0213	mg/L	1	0.00200	0.00005		GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:43	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.54	pCi/L	0.12	0.18		TTP	07/11/2023 11:33	SW-846 9315-1986, Rev. 0
Carrier Recovery	86.5	%						
Radium-228	0.37	pCi/L	0.12	0.38		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 231985-002-01
Preparation: Dissolved
Date Collected: 06/27/2023 12:01 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.018	µg/L	1	0.100	0.008	J1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Arsenic	0.06	µg/L	1	0.10	0.03	J1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Barium	52.1	µg/L	1	0.20	0.05		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Beryllium	0.180	µg/L	1	0.050	0.007		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Cadmium	0.016	µg/L	1	0.020	0.004	J1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Cobalt	2.78	µg/L	1	0.020	0.005		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Iron	0.074	mg/L	1	0.020	0.003		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Lithium	0.0424	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Manganese	0.0315	mg/L	1	0.00100	0.00008		GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:49	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-4 Customer Description: TG-32

Lab Number: 231985-003 Preparation:

Date Collected: 06/27/2023 12:10 EDT Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.018	µg/L	1	0.100	0.008	J1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Arsenic	1.23	µg/L	1	0.10	0.03		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Barium	132	µg/L	1	0.20	0.05		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Beryllium	0.376	µg/L	1	0.050	0.007		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Boron	0.018	mg/L	1	0.050	0.007	J1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Cadmium	0.021	µg/L	1	0.020	0.004		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Calcium	2.90	mg/L	1	0.05	0.01		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Chromium	0.56	µg/L	1	0.30	0.07		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Cobalt	3.89	µg/L	1	0.020	0.005		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Lead	0.15	µg/L	1	0.20	0.05	J1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Lithium	0.0240	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Magnesium	0.737	mg/L	1	0.100	0.006		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Potassium	2.32	mg/L	1	0.100	0.008		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Selenium	0.14	µg/L	1	0.50	0.04	J1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Sodium	6.68	mg/L	1	0.20	0.01		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Strontium	0.0248	mg/L	1	0.00200	0.00005		GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:54	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.38	pCi/L	0.22	0.20		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	97.0	%						
Radium-228	0.34	pCi/L	0.15	0.50		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	74.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-4
Customer Description: TG-32
Lab Number: 231985-003-01
Preparation: Dissolved
Date Collected: 06/27/2023 12:10 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Arsenic	0.03	µg/L	1	0.10	0.03	J1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Barium	122	µg/L	1	0.20	0.05		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Beryllium	0.361	µg/L	1	0.050	0.007		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Cadmium	0.019	µg/L	1	0.020	0.004	J1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Cobalt	3.82	µg/L	1	0.020	0.005		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Iron	0.142	mg/L	1	0.020	0.003		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Lithium	0.0245	mg/L	1	0.00030	0.00007		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Manganese	0.0358	mg/L	1	0.00100	0.00008		GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	07/11/2023 23:59	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

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Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-7 | Customer Description: TG-32
Lab Number: 231985-004 | Preparation:
Date Collected: 06/27/2023 10:51 EDT | Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Arsenic	1.14	µg/L	1	0.10	0.03		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Barium	40.3	µg/L	1	0.20	0.05		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Beryllium	5.11	µg/L	1	0.050	0.007		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Boron	2.02	mg/L	1	0.050	0.007		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Cadmium	0.691	µg/L	1	0.020	0.004		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Calcium	5.73	mg/L	1	0.05	0.01		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Chromium	0.47	µg/L	1	0.30	0.07		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Cobalt	39.3	µg/L	1	0.020	0.005		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Lead	0.88	µg/L	1	0.20	0.05		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Lithium	0.0780	mg/L	1	0.00030	0.00007		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Magnesium	9.21	mg/L	1	0.100	0.006		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Mercury	1220	ng/L	48	240	90		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Potassium	2.05	mg/L	1	0.100	0.008		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Selenium	4.53	µg/L	1	0.50	0.04		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Sodium	17.1	mg/L	1	0.20	0.01		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Strontium	0.0776	mg/L	1	0.00200	0.00005		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4
Thallium	0.20	µg/L	1	0.20	0.02		GES	07/12/2023 00:04	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.29	pCi/L	0.24	0.31		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.5	%						
Radium-228	3.40	pCi/L	0.19	0.50		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	80.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-7
Customer Description: TG-32
Lab Number: 231985-004-01
Preparation: Dissolved
Date Collected: 06/27/2023 10:51 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Arsenic	1.14	µg/L	1	0.10	0.03		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Barium	40.4	µg/L	1	0.20	0.05		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Beryllium	5.13	µg/L	1	0.050	0.007		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Cadmium	0.692	µg/L	1	0.020	0.004		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.55	µg/L	1	0.30	0.07		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Cobalt	39.9	µg/L	1	0.020	0.005		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Iron	0.049	mg/L	1	0.020	0.003		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Lead	0.87	µg/L	1	0.20	0.05		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.0785	mg/L	1	0.00030	0.00007		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Manganese	0.0812	mg/L	1	0.00100	0.00008		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Selenium	4.57	µg/L	1	0.50	0.04		GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4
Thallium	0.18	µg/L	1	0.20	0.02	J1	GES	07/12/2023 00:09	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

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Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-12 Customer Description: TG-32
Lab Number: 231985-005 Preparation:
Date Collected: 06/26/2023 08:55 EDT Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.015	µg/L	1	0.100	0.008	J1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Arsenic	0.11	µg/L	1	0.10	0.03		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Barium	16.3	µg/L	1	0.20	0.05		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Beryllium	0.110	µg/L	1	0.050	0.007		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Boron	0.019	mg/L	1	0.050	0.007	J1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.007	µg/L	1	0.020	0.004	J1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Calcium	0.21	mg/L	1	0.05	0.01		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.45	µg/L	1	0.30	0.07		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Cobalt	0.932	µg/L	1	0.020	0.005		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.00487	mg/L	1	0.00030	0.00007		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Magnesium	0.291	mg/L	1	0.100	0.006		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.7	µg/L	1	0.5	0.1		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Potassium	0.175	mg/L	1	0.100	0.008		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Selenium	0.23	µg/L	1	0.50	0.04	J1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Sodium	3.34	mg/L	1	0.20	0.01		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Strontium	0.00203	mg/L	1	0.00200	0.00005		GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/12/2023 00:14	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.45	pCi/L	0.13	0.21		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	106	%						
Radium-228	-0.11	pCi/L	0.14	0.50		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-12
Customer Description: TG-32
Lab Number: 231985-005-01
Preparation: Dissolved
Date Collected: 06/26/2023 08:55 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.014	µg/L	1	0.100	0.008	J1	GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Arsenic	0.1	µg/L	1	0.10	0.03		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Barium	16.5	µg/L	1	0.20	0.05		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Beryllium	0.112	µg/L	1	0.050	0.007		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Cadmium	0.006	µg/L	1	0.020	0.004	J1	GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Chromium	0.51	µg/L	1	0.30	0.07		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Cobalt	0.926	µg/L	1	0.020	0.005		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Iron	0.113	mg/L	1	0.020	0.003		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.00485	mg/L	1	0.00030	0.00007		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Manganese	0.00340	mg/L	1	0.00100	0.00008		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.5	µg/L	1	0.5	0.1		GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Selenium	0.25	µg/L	1	0.50	0.04	J1	GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/12/2023 00:19	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 231985-006
Preparation:
Date Collected: 06/26/2023 08:28 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Arsenic	1.56	µg/L	1	0.10	0.03		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Barium	39.8	µg/L	1	0.20	0.05		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Beryllium	0.234	µg/L	1	0.050	0.007		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Boron	0.067	mg/L	1	0.050	0.007		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Calcium	10.6	mg/L	1	0.05	0.01		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Cobalt	51.5	µg/L	1	0.020	0.005		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Lithium	0.142	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Magnesium	14.5	mg/L	1	0.100	0.006		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Potassium	4.98	mg/L	1	0.100	0.008		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Sodium	20.9	mg/L	1	0.20	0.01		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Strontium	0.0706	mg/L	1	0.00200	0.00005		GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/12/2023 01:26	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.68	pCi/L	0.17	0.24		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.5	%						
Radium-228	0.93	pCi/L	0.14	0.45		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 231985-006-01
Preparation: Dissolved
Date Collected: 06/26/2023 08:28 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Arsenic	1.18	µg/L	1	0.10	0.03		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Barium	39.9	µg/L	1	0.20	0.05		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Beryllium	0.193	µg/L	1	0.050	0.007		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Cobalt	52.0	µg/L	1	0.020	0.005		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Iron	45.0	mg/L	5	0.10	0.02		GES	07/12/2023 11:16	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Lithium	0.142	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Manganese	0.520	mg/L	1	0.00100	0.00008		GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/12/2023 01:31	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 231985-007
Preparation:
Date Collected: 06/26/2023 12:47 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Arsenic	0.16	µg/L	1	0.10	0.03		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Barium	112	µg/L	1	0.20	0.05		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Beryllium	0.354	µg/L	1	0.050	0.007		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Boron	0.032	mg/L	1	0.050	0.007	J1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Cadmium	0.022	µg/L	1	0.020	0.004		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Calcium	0.23	mg/L	1	0.05	0.01		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Chromium	0.49	µg/L	1	0.30	0.07		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Cobalt	5.15	µg/L	1	0.020	0.005		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Lead	0.13	µg/L	1	0.20	0.05	J1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Lithium	0.0106	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Magnesium	1.60	mg/L	1	0.100	0.006		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Mercury	297	ng/L	4	20	7		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Potassium	0.384	mg/L	1	0.100	0.008		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Selenium	0.17	µg/L	1	0.50	0.04	J1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Sodium	5.80	mg/L	1	0.20	0.01		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Strontium	0.00855	mg/L	1	0.00200	0.00005		GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/12/2023 01:36	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.10	pCi/L	0.27	0.24		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	105	%						
Radium-228	0.80	pCi/L	0.16	0.52		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	80.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Dolan Chemical Laboratory
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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 231985-007-01
Preparation: Dissolved
Date Collected: 06/26/2023 12:47 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Arsenic	0.08	µg/L	1	0.10	0.03	J1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Barium	121	µg/L	1	0.20	0.05		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Beryllium	0.369	µg/L	1	0.050	0.007		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Cadmium	0.023	µg/L	1	0.020	0.004		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Chromium	0.37	µg/L	1	0.30	0.07		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Cobalt	5.50	µg/L	1	0.020	0.005		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Iron	0.006	mg/L	1	0.020	0.003	J1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Lithium	0.0111	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Manganese	0.00528	mg/L	1	0.00100	0.00008		GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Selenium	0.16	µg/L	1	0.50	0.04	J1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/12/2023 01:42	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 231985-008
Preparation:
Date Collected: 06/27/2023 08:42 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Arsenic	0.55	µg/L	1	0.10	0.03		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Barium	89.0	µg/L	1	0.20	0.05		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Beryllium	0.132	µg/L	1	0.050	0.007		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Boron	0.009	mg/L	1	0.050	0.007	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Calcium	0.23	mg/L	1	0.05	0.01		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Chromium	0.57	µg/L	1	0.30	0.07		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Cobalt	0.933	µg/L	1	0.020	0.005		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Lead	0.13	µg/L	1	0.20	0.05	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Lithium	0.0138	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Magnesium	0.325	mg/L	1	0.100	0.006		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Mercury	10	ng/L	1	5	2		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Potassium	0.776	mg/L	1	0.100	0.008		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Selenium	0.15	µg/L	1	0.50	0.04	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Sodium	5.51	mg/L	1	0.20	0.01		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Strontium	0.00483	mg/L	1	0.00200	0.00005		GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	07/12/2023 01:47	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.57	pCi/L	0.14	0.20		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	102	%						
Radium-228	1.96	pCi/L	0.28	0.89		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	69.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Dolan Chemical Laboratory
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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 231985-008-01
Preparation: Dissolved
Date Collected: 06/27/2023 08:42 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Arsenic	0.05	µg/L	1	0.10	0.03	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Barium	91.9	µg/L	1	0.20	0.05		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Beryllium	0.150	µg/L	1	0.050	0.007		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Cadmium	0.014	µg/L	1	0.020	0.004	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Chromium	0.24	µg/L	1	0.30	0.07	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Cobalt	0.966	µg/L	1	0.020	0.005		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Iron	0.022	mg/L	1	0.020	0.003		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Lithium	0.0149	mg/L	1	0.00030	0.00007		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Manganese	0.00426	mg/L	1	0.00100	0.00008		GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Selenium	0.07	µg/L	1	0.50	0.04	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/12/2023 01:52	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-22 | Customer Description: TG-32
Lab Number: 231985-009 | Preparation:
Date Collected: 06/26/2023 09:43 EDT | Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.04	µg/L	5	0.50	0.04	U1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Arsenic	3.4	µg/L	5	0.5	0.2		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Barium	13.5	µg/L	5	1.0	0.3		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Beryllium	7.71	µg/L	5	0.25	0.04		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Boron	0.06	mg/L	5	0.25	0.04	J1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Cadmium	1.09	µg/L	5	0.10	0.02		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Calcium	15.5	mg/L	5	0.25	0.05		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Chromium	0.7	µg/L	5	1.5	0.4	J1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Cobalt	109	µg/L	5	0.10	0.03		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Lead	<0.3	µg/L	5	1.0	0.3	U1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Lithium	0.236	mg/L	5	0.0015	0.0004		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Magnesium	21.4	mg/L	5	0.50	0.03		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Mercury	29	ng/L	1	5	2		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.5	µg/L	5	2.5	0.5	U1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Potassium	4.55	mg/L	5	0.50	0.04		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Selenium	7.0	µg/L	5	2.5	0.2		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Sodium	90.8	mg/L	5	1.00	0.05		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Strontium	0.121	mg/L	5	0.0100	0.0003		GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4
Thallium	0.2	µg/L	5	1.0	0.1	J1	GES	07/12/2023 11:21	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.51	pCi/L	0.27	0.28		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	68.9	%						
Radium-228	2.26	pCi/L	0.17	0.48		ST	07/10/2023 16:11	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	80.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-22
Customer Description: TG-32
Lab Number: 231985-009-01
Preparation: Dissolved
Date Collected: 06/26/2023 09:43 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Arsenic	3.44	µg/L	1	0.10	0.03		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Barium	11.6	µg/L	1	0.20	0.05		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Beryllium	5.90	µg/L	1	0.050	0.007		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Cadmium	1.09	µg/L	1	0.020	0.004		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Chromium	0.41	µg/L	1	0.30	0.07		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Cobalt	112	µg/L	1	0.020	0.005		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Iron	37.4	mg/L	5	0.10	0.02		GES	07/12/2023 11:26	EPA 200.8-1994, Rev. 5.4
Lead	0.15	µg/L	1	0.20	0.05	J1	GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Lithium	0.188	mg/L	1	0.00030	0.00007		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Manganese	0.453	mg/L	1	0.00100	0.00008		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Selenium	8.05	µg/L	1	0.50	0.04		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.20	µg/L	1	0.20	0.02		GES	07/12/2023 02:02	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-28 | Customer Description: TG-32
Lab Number: 231985-010 | Preparation:
Date Collected: 06/26/2023 12:26 EDT | Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.015	µg/L	1	0.100	0.008	J1	GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Barium	119	µg/L	1	0.20	0.05		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Beryllium	0.562	µg/L	1	0.050	0.007		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Boron	0.299	mg/L	1	0.050	0.007		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Cadmium	0.054	µg/L	1	0.020	0.004		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Calcium	1.48	mg/L	1	0.05	0.01		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Chromium	0.47	µg/L	1	0.30	0.07		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Cobalt	13.1	µg/L	1	0.020	0.005		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Lithium	0.0235	mg/L	1	0.00030	0.00007		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Magnesium	2.89	mg/L	1	0.100	0.006		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Mercury	13	ng/L	1	5	2		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Potassium	0.764	mg/L	1	0.100	0.008		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Selenium	0.21	µg/L	1	0.50	0.04	J1	GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Sodium	5.82	mg/L	1	0.20	0.01		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Strontium	0.0204	mg/L	1	0.00200	0.00005		GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/12/2023 02:07	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.64	pCi/L	0.31	0.19		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.8	%						
Radium-228	1.36	pCi/L	0.16	0.47		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	88.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-28
Customer Description: TG-32
Lab Number: 231985-010-01
Preparation: Dissolved
Date Collected: 06/26/2023 12:26 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Barium	117	µg/L	1	0.20	0.05		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Beryllium	0.495	µg/L	1	0.050	0.007		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Cadmium	0.044	µg/L	1	0.020	0.004		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.30	0.07		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Cobalt	12.2	µg/L	1	0.020	0.005		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Iron	0.010	mg/L	1	0.020	0.003	J1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Lithium	0.0232	mg/L	1	0.00030	0.00007		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Manganese	0.0496	mg/L	1	0.00100	0.00008		GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Selenium	0.21	µg/L	1	0.50	0.04	J1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	07/12/2023 02:12	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 231985-011
Preparation:
Date Collected: 06/26/2023 12:03 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.010	µg/L	1	0.100	0.008	J1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Arsenic	0.21	µg/L	1	0.10	0.03		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Barium	76.7	µg/L	1	0.20	0.05		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Beryllium	0.086	µg/L	1	0.050	0.007		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Boron	1.80	mg/L	1	0.050	0.007		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Cadmium	0.008	µg/L	1	0.020	0.004	J1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Calcium	0.54	mg/L	1	0.05	0.01		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Chromium	0.57	µg/L	1	0.30	0.07		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Cobalt	3.81	µg/L	1	0.020	0.005		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Lithium	0.00896	mg/L	1	0.00030	0.00007		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Magnesium	1.92	mg/L	1	0.100	0.006		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Mercury	130	ng/L	2	10	4		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Potassium	0.754	mg/L	1	0.100	0.008		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Selenium	0.45	µg/L	1	0.50	0.04	J1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Sodium	71.8	mg/L	1	0.20	0.01		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Strontium	0.00865	mg/L	1	0.00200	0.00005		GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	07/25/2023 20:36	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.12	pCi/L	0.21	0.22		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.2	%						
Radium-228	0.56	pCi/L	0.15	0.48		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 231985-011-01
Preparation: Dissolved
Date Collected: 06/26/2023 12:03 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Arsenic	0.15	µg/L	1	0.10	0.03		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Barium	61.6	µg/L	1	0.20	0.05		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Beryllium	0.103	µg/L	1	0.050	0.007		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Cadmium	0.009	µg/L	1	0.020	0.004	J1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Cobalt	3.83	µg/L	1	0.020	0.005		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Iron	0.024	mg/L	1	0.020	0.003		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Lithium	0.00897	mg/L	1	0.00030	0.00007		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Manganese	0.0143	mg/L	1	0.00100	0.00008		GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Selenium	0.35	µg/L	1	0.50	0.04	J1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/25/2023 20:41	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-31
Customer Description: TG-32
Lab Number: 231985-012
Preparation:
Date Collected: 06/26/2023 11:01 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Arsenic	0.36	µg/L	1	0.10	0.03		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Barium	32.9	µg/L	1	0.20	0.05		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Beryllium	1.08	µg/L	5	0.25	0.04		GES	07/26/2023 11:44	EPA 200.8-1994, Rev. 5.4
Boron	0.025	mg/L	1	0.050	0.007	J1	GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Cadmium	0.064	µg/L	1	0.020	0.004		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Calcium	2.69	mg/L	1	0.05	0.01		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Chromium	0.63	µg/L	1	0.30	0.07		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Cobalt	10.1	µg/L	1	0.020	0.005		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Lead	0.33	µg/L	1	0.20	0.05		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Lithium	0.0889	mg/L	5	0.0015	0.0004		GES	07/26/2023 11:44	EPA 200.8-1994, Rev. 5.4
Magnesium	3.92	mg/L	1	0.100	0.006		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Mercury	77	ng/L	1	5	2		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Potassium	1.55	mg/L	1	0.100	0.008		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Selenium	0.78	µg/L	1	0.50	0.04		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Sodium	31.1	mg/L	1	0.20	0.01		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Strontium	0.0389	mg/L	1	0.00200	0.00005		GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	07/25/2023 20:46	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.21	pCi/L	0.29	0.26		TTP	07/07/2023 13:34	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.9	%						
Radium-228	2.08	pCi/L	0.16	0.44		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	82.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-31
Customer Description: TG-32
Lab Number: 231985-012-01
Preparation: Dissolved
Date Collected: 06/26/2023 11:01 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Arsenic	0.26	µg/L	1	0.10	0.03		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Barium	31.1	µg/L	1	0.20	0.05		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Beryllium	1.06	µg/L	5	0.25	0.04		GES	07/26/2023 11:49	EPA 200.8-1994, Rev. 5.4
Cadmium	0.065	µg/L	1	0.020	0.004		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Cobalt	9.88	µg/L	1	0.020	0.005		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Iron	0.109	mg/L	1	0.020	0.003		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Lead	0.28	µg/L	1	0.20	0.05		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Lithium	0.0871	mg/L	5	0.0015	0.0004		GES	07/26/2023 11:49	EPA 200.8-1994, Rev. 5.4
Manganese	0.0257	mg/L	1	0.00100	0.00008		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Mercury	7	ng/L	1	5	2		RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Selenium	0.80	µg/L	1	0.50	0.04		GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4
Thallium	0.08	µg/L	1	0.20	0.02	J1	GES	07/25/2023 20:51	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-32
Customer Description: TG-32
Lab Number: 231985-013
Preparation:
Date Collected: 06/26/2023 09:30 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.012	µg/L	1	0.100	0.008	J1	GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Arsenic	1.53	µg/L	1	0.10	0.03		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Barium	23.4	µg/L	1	0.20	0.05		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Beryllium	0.905	µg/L	1	0.050	0.007		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Boron	0.595	mg/L	1	0.050	0.007		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Cadmium	0.042	µg/L	1	0.020	0.004		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Calcium	5.26	mg/L	1	0.05	0.01		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Chromium	0.61	µg/L	1	0.30	0.07		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Cobalt	15.9	µg/L	1	0.020	0.005		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Lead	0.17	µg/L	1	0.20	0.05	J1	GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Lithium	0.0500	mg/L	1	0.00030	0.00007		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Magnesium	5.74	mg/L	1	0.100	0.006		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Mercury	760	ng/L	10	50	20		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Potassium	2.57	mg/L	1	0.100	0.008		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Selenium	1.59	µg/L	1	0.50	0.04		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Sodium	27.0	mg/L	1	0.20	0.01		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Strontium	0.0736	mg/L	1	0.00200	0.00005		GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4
Thallium	0.11	µg/L	1	0.20	0.02	J1	GES	07/25/2023 20:56	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.41	pCi/L	0.20	0.17		TTP	07/11/2023 12:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.4	%						
Radium-228	2.52	pCi/L	0.17	0.46		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-32
Customer Description: TG-32
Lab Number: 231985-013-01
Preparation: Dissolved
Date Collected: 06/26/2023 09:30 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Arsenic	1.29	µg/L	1	0.10	0.03		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Barium	23.4	µg/L	1	0.20	0.05		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Beryllium	1.08	µg/L	1	0.050	0.007		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Cadmium	0.064	µg/L	1	0.020	0.004		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Cobalt	17.1	µg/L	1	0.020	0.005		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Iron	10.7	mg/L	1	0.020	0.003		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Lithium	0.0527	mg/L	1	0.00030	0.00007		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Manganese	0.0782	mg/L	1	0.00100	0.00008		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Mercury	27	ng/L	1	5	2		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Selenium	1.74	µg/L	1	0.50	0.04		GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	GES	07/25/2023 21:01	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 231985-014
Preparation:
Date Collected: 06/26/2023 10:34 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.021	µg/L	1	0.100	0.008	J1	GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Arsenic	1.08	µg/L	1	0.10	0.03		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Barium	41.4	µg/L	1	0.20	0.05		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Beryllium	1.48	µg/L	5	0.25	0.04		GES	07/26/2023 11:54	EPA 200.8-1994, Rev. 5.4
Boron	0.114	mg/L	1	0.050	0.007		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Cadmium	0.056	µg/L	1	0.020	0.004		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Calcium	1.73	mg/L	1	0.05	0.01		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Chromium	0.39	µg/L	1	0.30	0.07		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Cobalt	10.7	µg/L	1	0.020	0.005		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Lead	0.48	µg/L	1	0.20	0.05		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Lithium	0.0246	mg/L	5	0.0015	0.0004		GES	07/26/2023 11:54	EPA 200.8-1994, Rev. 5.4
Magnesium	4.05	mg/L	1	0.100	0.006		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Mercury	5610	ng/L	100	500	200		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Potassium	0.271	mg/L	1	0.100	0.008		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Selenium	4.21	µg/L	1	0.50	0.04		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Sodium	16.8	mg/L	1	0.20	0.01		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Strontium	0.0303	mg/L	1	0.00200	0.00005		GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/25/2023 21:07	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.78	pCi/L	0.17	0.24		TTP	07/11/2023 12:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	86.1	%						
Radium-228	1.18	pCi/L	0.16	0.48		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 231985-014-01
Preparation: Dissolved
Date Collected: 06/26/2023 10:34 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Arsenic	1.07	µg/L	1	0.10	0.03		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Barium	40.5	µg/L	1	0.20	0.05		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Beryllium	1.17	µg/L	1	0.050	0.007		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Cadmium	0.053	µg/L	1	0.020	0.004		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Chromium	0.29	µg/L	1	0.30	0.07	J1	GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Cobalt	10.4	µg/L	1	0.020	0.005		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Iron	0.014	mg/L	1	0.020	0.003	J1	GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Lead	0.26	µg/L	1	0.20	0.05		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Lithium	0.0202	mg/L	1	0.00030	0.00007		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Manganese	0.00629	mg/L	1	0.00100	0.00008		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Mercury	670	ng/L	10	50	20		RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Selenium	4.09	µg/L	1	0.50	0.04		GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/25/2023 21:12	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

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Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: Duplicate - 1
Customer Description: TG-32
Lab Number: 231985-015
Preparation:
Date Collected: 06/26/2023 13:00 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Arsenic	1.55	µg/L	1	0.10	0.03		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Barium	39.1	µg/L	1	0.20	0.05		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Beryllium	0.223	µg/L	1	0.050	0.007		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Boron	0.069	mg/L	1	0.050	0.007		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Calcium	10.5	mg/L	1	0.05	0.01		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Chromium	0.29	µg/L	1	0.30	0.07	J1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Cobalt	53.7	µg/L	1	0.020	0.005		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Lithium	0.141	mg/L	1	0.00030	0.00007		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Magnesium	14.9	mg/L	1	0.100	0.006		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Potassium	4.98	mg/L	1	0.100	0.008		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Sodium	21.3	mg/L	1	0.20	0.01		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Strontium	0.0691	mg/L	1	0.00200	0.00005		GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	07/25/2023 21:17	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

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Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: Duplicate - 1
Customer Description: TG-32
Lab Number: 231985-015-01
Preparation: Dissolved
Date Collected: 06/26/2023 13:00 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Arsenic	1.17	µg/L	1	0.10	0.03		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Barium	39.6	µg/L	1	0.20	0.05		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Beryllium	0.210	µg/L	1	0.050	0.007		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Cobalt	53.1	µg/L	1	0.020	0.005		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Iron	43.0	mg/L	5	0.10	0.02		GES	07/26/2023 12:04	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Lithium	0.141	mg/L	1	0.00030	0.00007		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Manganese	0.520	mg/L	1	0.00100	0.00008		GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/06/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	07/25/2023 21:22	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: Equipment Blank
Customer Description: TG-32
Lab Number: 231985-016
Preparation:
Date Collected: 06/26/2023 09:40 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Beryllium	0.027	µg/L	1	0.050	0.007	J1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Cobalt	0.037	µg/L	1	0.020	0.005		GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/25/2023 21:27	EPA 200.8-1994, Rev. 5.4

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Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: Field Blank
Customer Description: TG-32
Lab Number: 231985-017
Preparation:
Date Collected: 06/26/2023 12:25 EDT
Date Received: 06/30/2023 11:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Beryllium	0.015	µg/L	1	0.050	0.007	J1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Chromium	0.53	µg/L	1	0.30	0.07		GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Cobalt	0.036	µg/L	1	0.020	0.005		GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	07/10/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	07/25/2023 21:32	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.20	pCi/L	0.08	0.19		TTP	07/11/2023 12:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.8	%						
Radium-228	-0.02	pCi/L	0.13	0.46		ST	07/12/2023 14:00	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

231985
Job Comments:

Report originally issued 8/4/23. Report reissued 10/29/23 to correct rounding errors on report and EDD.

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

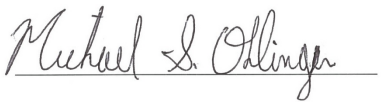
Water Analysis Report

Reissued

Job ID: 231985 **Customer: Pirkey Power Station** **Date Reported: 10/29/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
(•) Routine (28 days for Monitoring Wells)

Site Contact: | Date:

For Lab Use Only:
COC/Order #: 231985

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 — Sb, As, B, Ba, Be, Ca, Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 — Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 — Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 — Mercury	250 mL Glass bottle, HCL**, pH<2 — Dissolved Mercury			Sample Specific Notes:
AD-2	6/26/2023	1042	G	GW	7		X	X	X	X	X			
AD-3	6/27/2023	1101	G	GW	7		X	X	X	X	X			
AD-4	6/27/2023	1110	G	GW	7		X	X	X	X	X			
AD-7	6/27/2023	951	G	GW	7		X	X	X	X	X			
AD-12	6/26/2023	755	G	GW	7		X	X	X	X	X			
AD-13	6/26/2023	728	G	GW	10		X	X	X	X	X			
AD-17	6/26/2023	1147	G	GW	7		X	X	X	X	X			
AD-18	6/27/2023	742	G	GW	7		X	X	X	X	X			
AD-22	6/26/2023	843	G	GW	7		X	X	X	X	X			
AD-28	6/26/2023	1126	G	GW	7		X	X	X	X	X			
AD-30	6/26/2023	1103	G	GW	7		X	X	X	X	X			
AD-31	6/26/2023	1001	G	GW	7		X	X	X	X	X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							**4**	**F4**	**4**	**2**	**F2**			

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eng	6-28-23 1600		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 6/30/23 11:30Am

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 Sb, As, B, Ba, Be, Ca Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Mercury	250 mL Glass bottle, HCL**, pH<2 Dissolved Mercury			Sample Specific Notes:
AD-32	6/26/2023	830	G	GW	7		X	X	X	X	X			
AD-33	6/23/2023	934	G	GW	7		X	X	X	X	X			
Duplicate - 1	6/26/2023	1200	G	GW	4		X	X		X	X			
Equipment Blank	6/26/2023	840	G	GW	2		X			X				
Field Blank	6/26/2023	1125	G	GW	5		X		X	X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eqk	6-26-23 16:00		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			Michael Ohlinger	6/30/23 11:30 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pickry **Number of Plastic Containers:** 81

Opened By WCG / MGK 6/20/23 **Number of Glass Containers:** 32

Date/Time 6/20/23 11:30 AM **Number of Mercury Containers:** -

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / (no ice)

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MGK WCG 6/20/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 231985 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

_____

Reviewed by WCG _____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha Palmer	Tamisha T. Palmer	Chemical Laboratory Technician, Prin	07/11/2023
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/011/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070304

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	No	ER1
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	NA	
	I	Were analytical duplicates analyzed at the appropriate frequency?	NA	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/011/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070304

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/011/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070304

Exception Report No.	Description
ER1	The precision between the MS and MSD was not within 25%

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Radium 228 Sample Prep Batch Worksheet
[RM: EPA SW846 9320]

2nd Table - DETERMINATION OF BARIUM CARRIER RECOVERY OR 226 Prep Sheet **Precipitation Time:_____ Date: _____**

Sample ID/Bottle ID		Planchet initial wt - g	Planchet + Ba ppt final wt - g	Comments
MB	1	7.3233	7.3820	
LCS	2	7.3617	7.4175	
LCSD	3	7.3458	7.4038	
	4	7.3197	7.3774	
	5	7.3119	7.3674	
~~7.2875~~	6	~~7.2875~~	7.3418	
	7	7.3091	7.3640	
	8	7.3067	7.3625	
	9	7.2914	7.3484	
	10	7.2830	7.3393	
	11	7.3011	7.3600	
	12	7.3003	7.3606	
	13	7.3348	7.3858	
	14	7.3261	7.3791	
	15	7.3316	7.3884	
	16	7.2845	7.3416	
MS	17			
MSD	18			07/12/23 ST
	19			
	20			

This form is used in compliance with the Dolan Radiation Safety Program, and these activities may only be performed by employees who

Radium 228 Sample Prep Batch Worksheet
[RM: EPA SW846 9320]

Form SOP-7115 Rev. 5, 02/13/2023
WWAG Radium 228 Sample Prep Batch Worksheet [Radium SOPs]

Bulk Reagents:	**Lot #**	**Received Date**	**Expiration Date (per bottle/CoA)**
"DI water", (ASTM Type II) **(Circle one below)** (IN-HOUSE or purchased from Kroger)	N/A	06/21/23	03/07/2024
Glacial Acetic Acid, 99.7% (17.4N conc. CH3COOH) (Fisher, PN A38C-212	217480	03/28/2022	N/A
15N (conc) Ammonium Hydroxide, NH4OH (Fisher, PN A669C-212)	230389 ~~218097~~ TP 7/6/23	04/24/2023 ~~09/12/2022~~ TP 7/6/23	N/A
16N (conc) Nitric Acid, (J.T. Baker , PN 9598-34) GFS 58033	22I2062003 22420072	05/17/2022 11/16/2022	Retest 08/30/2027
6N Nitric Acid, (Aqua Solutions, PN 6471-500 ML)	1110352	05/27/2022	11/30/2023
2N Nitric Acid, Dilute 33.3 mL of 6 N HNO3 to 100 mL with distilled water	Prep Date	06/15/23	
1M Nitric Acid, (Labchem , PN LC178402)	M152-35	07/28/2022	06/18/2024
10N Sodium hydroxide, (Fisher , PN SS255-1)	213058	03/28/2022	03/09/2026
19N Sodium hydroxide, (GFS Chemical , PN 2131)	23010160	01/24/2023	03/09/2026
18N Sulfuric acid, (i.e. 50% v/v) (GFS Chemical , PN 1977)	22150092	11/16/2022	03/30/2026

Prepared Reagents Dates: See current Reagent Prep records

EDTA (ID#) 06/26/23 **Ammonium Sulfate** 06/13/23 **Citric Acid** 06/08/23 **Pb Carrier** 06/29/23
Add ID# for any lot changes within same date

Strontium 05/25/23 **Methyl Orange** 06/20/23 **Ammonium Sulfide** 04/17/2023

Radium 228 Sample Prep Batch Worksheet
[RM: EPA SW846 9320]

Form SOP-7115 Rev. 5, 02/13/2023
WWAG Radium 228 Sample Prep Batch Worksheet [Radium SOPs]

Quality Assurance Samples – *prepared and analyzed in the same manner as the samples.*

	QC LIMITS
MB *Prepare an LRB every twenty or less samples.*	**≤ 0.95 (TNI critical value)**
LCS and LCSD ("QC"), ~ 10 pCi/L *Pipet 1.0 mL of Radium-228 spiking solution standard into a 1000-mL acidified Distilled I water.*	**75-125% Rec and ≤ 25% rpd**
MS and MSD ~ 10 pCi/L *Pipet 1.0 mL of Radium-228 spiking solution standard into a 1000-mL acidified sample.*	**60-140% Rec and ≤ 25% rpd**

Radium-228 Spike Value: 5.146 pCi

Inlet Gas Pressure: 9.20 PSI

Traceability Information: **Balance used: (Model/Serial Number):** **Mettler Toledo XS204, SN B13 6222 909**

Centrifuge Tubes:
Brand: Cell Treat Cat. No.: 230421 A Lot # 210522-060 Mix Lot

Planchets:
Brand: Ludlum Cat. No. 7525-371-01 Lot # N/A

Syringes (30mL, Norm-J, Luer lock) 07/12/23 ST
Brand: Henke-Sass Cat. No.: 8300020494 Lot # ~~21-1060-B~~ 21K100B

Syringe filters (0.45-micron pore size) 220925-052-1A
Brand: Cell Treat Cat. No.: 229766 Lot # ~~220804-052-1A~~ 07/12/23 ST

	(0.1 -1mL)	(0.1 -1mL)	(0.1 -1mL)	(0.25 -2.5 mL)	(0.5 - 5 mL	(1-10 mL)
Pipettes used:	1269178	4652555	J37233F	M457391	2074526	L17911F
Serial #	Eppendorf	Eppendorf	Eppendorf	Eppendorf	Eppendorf	Eppendorf
	Research Plus	Research Plus	Research Plus	Research Plus	Research Plus	Research Plus
Tip Brand:	Eppendorf	Eppendorf	Eppendorf	Eppendorf	Eppendorf	Eppendorf
Cat. No.	022491351	022491351	022491351			022492098

Foot notes for 1st Table
[3] "Reference Date" is the date prepared for LRB; reference date of the original certified standard for LFB/LFBD, MS/MSD; and collection date for field samples.
[4] "t0, "Time of last BaSO4 ppt" is the time (and date) of the last BaSO4 precipitation (= t0).
[5] "Aging Time" (in hours) just after addition of 5mL of 19N NaOH. The Aging Time must be ≥ 37 hours.
[6] "Time of Yt ppt" is the time (and date) of Yttrium precipitation.

Analysis Date: 07/13/23 **Analyst:** Ginosina

Form SOP 7403
WWAG Radium 228
Sample Prep Batch Calculations
Rev 1, 02/14/2022

Radium 228
Sample Prep Batch Calculations
(by EPA SW846 9320)

Sample ID	Ba Initial (g) #	Ba Final (g) #	Ba Weight (g)	Ba Recovery	Ba Recovery %	Yt Initial (g) #	Yt Final (g) #	Yt Weight (g)	Yt Recovery	Yt Recovery %	Ba*Yt Recovery
M. BLK	7.3233	7.382	0.0587	1.085028	108.5028	7.3679	7.3912	0.0233	0.809028	80.9028	0.87781757
LCS	7.3617	7.4175	0.0558	1.031423	103.1423	7.337	7.3608	0.0238	0.826389	82.6389	0.85235675
LCSD	7.3458	7.4038	0.058	1.072089	107.2089	7.2969	7.322	0.0251	0.871528	87.1528	0.9343551
231985-010	7.3197	7.3774	0.0577	1.066543	106.6543	7.3379	7.3619	0.024	0.833333	83.3333	0.8887862
231985-011	7.3119	7.3674	0.0555	1.025878	102.5878	7.2893	7.3134	0.0241	0.836806	83.6806	0.85846041
231985-012	7.2875	7.3418	0.0543	1.003697	100.3697	7.2718	7.2955	0.0237	0.822917	82.2917	0.82595887
231985-013	7.3091	7.364	0.0549	1.014787	101.4787	7.3254	7.3496	0.0242	0.840278	84.0278	0.85270333
231985-014	7.3067	7.3625	0.0558	1.031423	103.1423	7.2838	7.3083	0.0245	0.850694	85.0694	0.87742606
231985-017	7.2914	7.3484	0.057	1.053604	105.3604	7.2884	7.3129	0.0245	0.850694	85.0694	0.89629544
231991-001	7.283	7.3393	0.0563	1.040665	104.0665	7.3104	7.3331	0.0227	0.788194	78.8194	0.82024671
231991-002	7.3011	7.36	0.0589	1.088725	108.8725	7.3192	7.3432	0.024	0.833333	83.3333	0.90727049
231991-003	7.3003	7.3606	0.0603	1.114603	111.4603	7.307	7.3317	0.0247	0.857639	85.7639	0.95592652
231991-004	7.3348	7.3858	0.051	0.942699	94.2699	7.3337	7.3581	0.0244	0.847222	84.7222	0.79867529
231991-005	7.3261	7.3791	0.053	0.979667	97.9667	7.3289	7.3526	0.0237	0.822917	82.2917	0.80618453
231991-001 MS	7.3316	7.3884	0.0568	1.049908	104.9908	7.3636	7.388	0.0244	0.847222	84.7222	0.88950503
231991-001 MSD	7.2845	7.3416	0.0571	1.055453	105.5453	7.3275	7.352	0.0245	0.850694	85.0694	0.89786789
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0
			0	0.000000	0.0000			0	0.000000	0.0000	0

Standarized	Barium Carrier
0.0541	(g of BaSO4)

Ba Carrier Prep Date: 3/7/2023

Theoretical	Yttrium Carrier
0.0288	(g of Yttrium)

Yt Carrier Prep Date: 8/1/2022

Ba Recovery = (Wt on Planchet) / (Wt BaSO4 in Standardized Barium Carrier)

Yt Recovery = (Wt on Planchet) / (Wt Yttrium in Theoretical Yttrium Carrier)

Initial and Final weights are from Form SOP-7115, the Ra228 Sample Prep Batch Worksheet

Date: 07/13/23

Analyst: [signature]

This form is used in compliance with the Dolan Radiation Safety Program, and these activities may only be performed by employees who have completed the Dolan Radiation Workers Program. Contact the RSO for questions and concerns.

Parsea 07/13/23 SK

Apex-Alpha/Beta™

CANBERRA

Radiation Safety Amplified.

Unknown Batch Report

Device Name	Drawer D
Batch Id	PB23070606 228

Calibration	Strontium-90
Procedure	Unknown Radium 228

Count Mode	Simultaneous	
Eff Type	Alpha	Beta
	Constant	Constant

Sample Ordinal	Sample ID	Sample Amount (L)	Residual (mg)	Start Date/Time	Count Time (Minutes)	α Rate (CPM)	α Concentration (pCi/L)	α MDA	β Rate (CPM)	β Concentration (pCi/L)	β MDA	Detector
1	M.BLK	1	0	7/12/2023 2:00:46 PM	120.00	0.117 +/-0.0312	0.23 +/-0.0997	0.276	0.883 +/-0.0858	0.302 +/-0.151	0.484	Detector 1A
5	231985-011	1	0	7/12/2023 2:00:47 PM	120.00	0.108 +/-0.03	0.113 +/-0.112	0.388	0.908 +/-0.087	0.279 +/-0.148	0.48	Detector 1B
9	231985-017	1	0	7/12/2023 2:00:47 PM	120.00	0.108 +/-0.03	0.145 +/-0.094	0.305	0.725 +/-0.0777	-0.0114 +/-0.133	0.46	Detector 1C
13	231991-004	1	0	7/12/2023 2:00:48 PM	120.00	0.15 +/-0.0354	0.21 +/-0.131	0.42	1.28 +/-0.103	0.652 +/-0.17	0.512	Detector 1D
2	LCS	1	0	7/12/2023 2:00:46 PM	120.00	0.192 +/-0.04	0.421 +/-0.122	0.283	3.03 +/-0.159	2.63 +/-0.199	0.413	Detector 2A
6	231985-012	1	0	7/12/2023 2:00:47 PM	120.00	0.1 +/-0.0289	0.177 +/-0.112	0.363	1.63 +/-0.116	1.03 +/-0.163	0.441	Detector 2B
10	231991-001	1	0	7/12/2023 2:00:47 PM	120.00	0.0333 +/-0.0167	-0.0825 +/-0.0782	0.359	0.717 +/-0.0773	0.0865 +/-0.119	0.412	Detector 2C
14	231991-005	1	0	7/12/2023 2:00:48 PM	120.00	0.217 +/-0.0425	0.469 +/-0.155	0.418	1.95 +/-0.127	1.37 +/-0.191	0.516	Detector 2D
3	LCSD	1	0	7/12/2023 2:00:46 PM	120.00	0.208 +/-0.0417	0.416 +/-0.114	0.265	3.08 +/-0.16	2.42 +/-0.195	0.446	Detector 3A
7	231985-013	1	0	7/12/2023 2:00:47 PM	120.00	0.117 +/-0.0312	0.157 +/-0.0999	0.322	1.77 +/-0.121	1.24 +/-0.173	0.461	Detector 3B
11	231991-002	1	0	7/12/2023 2:00:48 PM	120.00	0.142 +/-0.0344	0.246 +/-0.098	0.27	1.48 +/-0.111	0.803 +/-0.148	0.417	Detector 3C
15	231991-001MS	1	0	7/12/2023 2:00:48 PM	120.00	0.192 +/-0.04	0.381 +/-0.124	0.32	3.5 +/-0.171	2.92 +/-0.217	0.483	Detector 3D

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha Palmer	Tamisha T. Palmer	Chemical Technician Prin	07/13/2023
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/13/2023

Laboratory Job Number: 231985, 231991

Prep Batch Number(s): PB23070606

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	NA	
	I	Were analytical duplicates analyzed at the appropriate frequency?	NA	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/13/2023

Laboratory Job Number: 231985, 231991

Prep Batch Number(s): PB23070606

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 07/13/2023

Laboratory Job Number: 231985, 231991

Prep Batch Number(s): PB23070606

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [•] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	08/03/2023
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070502 PB23070503 QC2307072 QC2307106 QC2307184 QC2307222

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	YES	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	YES	
	I	Were MS/MSD RPDs within laboratory QC limits?	YES	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070502 PB23070503 QC2307072 QC2307106 QC2307184 QC2307222

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/03/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070502 PB23070503 QC2307072 QC2307106 QC2307184 QC2307222

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is CCB<2.2*MDL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [•] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sunita Timsina	Timsina	Chemist Associate	07/12/2023
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Station

Reviewer Name: Sunita Timsina

LRC Date: 07/12/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070305, PB23070306, PB23070605

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	No	ER1
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Station

Reviewer Name: Sunita Timsina

LRC Date: 07/12/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070305, PB23070306, PB23070605

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Station

Reviewer Name: Sunita Timsina

LRC Date: 07/12/2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070305, PB23070306, PB23070605

Exception Report No.	Description
ER1	PB23070605, RPD between a sample and duplicate sample was above acceptance limit.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 07-18-2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070601, PB23070602, PB23070701, PB23070702

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?		
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 07-18-2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070601, PB23070602, PB23070701, PB23070702

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 07-18-2023

Laboratory Job Number: 231985

Prep Batch Number(s): PB23070601, PB23070602, PB23070701, PB23070702

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 232658 **Customer: Pirkey Power Station** **Date Reported: 09/22/2023**

Customer Sample ID: AD-23 Customer Description: TG-32
Lab Number: 232658-001 Preparation:
Date Collected: 08/23/2023 09:38 EDT Date Received: 08/25/2023 12:53 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.026	mg/L	1	0.050	0.007	J1	GES	08/30/2023 12:10	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34 Customer Description: TG-32
Lab Number: 232658-002 Preparation:
Date Collected: 08/23/2023 08:45 EDT Date Received: 08/25/2023 12:53 EDT

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1560	mg/L	1	50	20		ELT	08/28/2023 09:19	SM 2540C-2015

Customer Sample ID: AD-36 Customer Description: TG-32
Lab Number: 232658-003 Preparation:
Date Collected: 08/23/2023 08:06 EDT Date Received: 08/25/2023 12:53 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	11.8	mg/L	2	0.04	0.01		CRJ	08/29/2023 13:16	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	1.22	mg/L	1	0.05	0.01		GES	08/30/2023 12:15	EPA 200.8-1994, Rev. 5.4

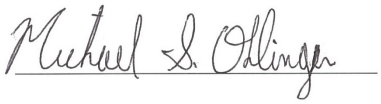
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 232658 **Customer: Pirkey Power Station** **Date Reported: 09/22/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

232658

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP Landfill CCR Resample
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Kenny McDonald Brad Bates

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO3 — Boron	250 mL bottle, pH<2, HNO3 — Calcium	250 mL bottle, Cool, 0-6C — Chloride	1 L bottle, Cool, 0-6C — TDS				Sample Specific Notes
AD-23	8/23/2023	838	G	GW	1		X							
AD-34	8/23/2023	745	G	GW	1					X				
AD-36	8/23/2023	706	G	GW	2			X	X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	ENEL6	08/24/23 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			[signature]	08/25/23 11:55 am

WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY (UPS) FedEX USPS
	Other _____

Plant/Customer Pitkey PP Number of Plastic Containers: 4

Opened By Misgina Number of Glass Containers: _____

Date/Time 08/25/23 11:55 Am Number of Mercury Containers: _____

Were all temperatures within 0-6°C? (Y) / N or N/A Initial: mbc (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 21 days If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? Y / (N) or N/A **Initial & Date**: mbc 08/25/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RVBG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 232658 Initial & Date & Time : _____

Logged by mbc Comments: _____

Reviewed by WCG

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold		Chemist Principal	9/7/2023
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Tim Arnold

LRC Date: 9/7/2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308242

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Tim Arnold

LRC Date: 9/7/2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308242

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Tim Arnold

LRC Date: 9/7/2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308242

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sandra Williams	Sandra D. Williams	Chemist	9-14-2023
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Sandra Williams

LRC Date: 9-14-2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308258

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Sandra Williams

LRC Date: 9-14-2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308258

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Sandra Williams

LRC Date: 9-14-2023

Laboratory Job Number: 232658

Prep Batch Number(s): QC2308258

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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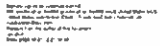
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [•] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	9-21-2023
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Jonathan Barnhill

LRC Date: 9-21-2023

Laboratory Job Number: 232658

Prep Batch Number(s): PB23082902 QC2308264

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Jonathan Barnhill

LRC Date: 9-21-2023

Laboratory Job Number: 232658

Prep Batch Number(s): PB23082902 QC2308264

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Landfill CCR Resample

Reviewer Name: Jonathan Barnhill

LRC Date: 9-21-2023

Laboratory Job Number: 232658

Prep Batch Number(s): PB23082902 QC2308264

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is CCB<2.2*MDL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233280 **Customer: Pirkey Power Station** **Date Reported: 12/08/2023**

Customer Sample ID: AD-8
Customer Description: TG-32
Lab Number: 233280-001
Preparation:
Date Collected: 10/18/2023 11:54 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.11	mg/L	1	0.050	0.007		GES	11/01/2023 11:44	EPA 200.8-1994, Rev. 5.4
Calcium	19.6	mg/L	1	0.05	0.01		GES	11/01/2023 11:44	EPA 200.8-1994, Rev. 5.4
Magnesium	2.27	mg/L	1	0.100	0.006		GES	11/01/2023 11:44	EPA 200.8-1994, Rev. 5.4
Potassium	0.595	mg/L	1	0.100	0.008		GES	11/01/2023 11:44	EPA 200.8-1994, Rev. 5.4
Sodium	13.4	mg/L	1	0.20	0.01		GES	11/01/2023 11:44	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-16
Customer Description: TG-32
Lab Number: 233280-002
Preparation:
Date Collected: 10/18/2023 12:42 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.026	mg/L	1	0.050	0.007	J1	GES	11/01/2023 10:43	EPA 200.8-1994, Rev. 5.4
Calcium	1.13	mg/L	1	0.05	0.01		GES	11/01/2023 10:43	EPA 200.8-1994, Rev. 5.4
Magnesium	1.83	mg/L	1	0.100	0.006		GES	11/01/2023 10:43	EPA 200.8-1994, Rev. 5.4
Potassium	1.90	mg/L	1	0.100	0.008		GES	11/01/2023 10:43	EPA 200.8-1994, Rev. 5.4
Sodium	10.8	mg/L	1	0.20	0.01		GES	11/01/2023 10:43	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-23
Customer Description: TG-32
Lab Number: 233280-003
Preparation:
Date Collected: 10/18/2023 09:45 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.051	mg/L	1	0.050	0.007		GES	11/01/2023 10:48	EPA 200.8-1994, Rev. 5.4
Calcium	0.26	mg/L	1	0.05	0.01		GES	11/01/2023 10:48	EPA 200.8-1994, Rev. 5.4
Magnesium	0.211	mg/L	1	0.100	0.006		GES	11/01/2023 10:48	EPA 200.8-1994, Rev. 5.4
Potassium	4.19	mg/L	1	0.100	0.008		GES	11/01/2023 10:48	EPA 200.8-1994, Rev. 5.4
Sodium	3.07	mg/L	1	0.20	0.01		GES	11/01/2023 10:48	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233280 **Customer: Pirkey Power Station** **Date Reported: 12/08/2023**

Customer Sample ID: AD-27
Customer Description: TG-32
Lab Number: 233280-004
Preparation:
Date Collected: 10/18/2023 12:01 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.040	mg/L	1	0.050	0.007	J1	GES	11/01/2023 12:00	EPA 200.8-1994, Rev. 5.4
Calcium	3.76	mg/L	1	0.05	0.01		GES	11/01/2023 12:00	EPA 200.8-1994, Rev. 5.4
Magnesium	4.95	mg/L	1	0.100	0.006		GES	11/01/2023 12:00	EPA 200.8-1994, Rev. 5.4
Potassium	2.10	mg/L	1	0.100	0.008		GES	11/01/2023 12:00	EPA 200.8-1994, Rev. 5.4
Sodium	7.78	mg/L	1	0.20	0.01		GES	11/01/2023 12:00	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34
Customer Description: TG-32
Lab Number: 233280-005
Preparation:
Date Collected: 10/18/2023 10:21 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.057	mg/L	1	0.050	0.007		GES	11/01/2023 12:05	EPA 200.8-1994, Rev. 5.4
Calcium	34.6	mg/L	1	0.05	0.01		GES	11/01/2023 12:05	EPA 200.8-1994, Rev. 5.4
Magnesium	30.4	mg/L	1	0.100	0.006		GES	11/01/2023 12:05	EPA 200.8-1994, Rev. 5.4
Potassium	6.55	mg/L	1	0.100	0.008		GES	11/01/2023 12:05	EPA 200.8-1994, Rev. 5.4
Sodium	12.9	mg/L	1	0.20	0.01		GES	11/01/2023 12:05	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-36
Customer Description: TG-32
Lab Number: 233280-006
Preparation:
Date Collected: 10/18/2023 11:08 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.081	mg/L	1	0.050	0.007		GES	11/01/2023 12:10	EPA 200.8-1994, Rev. 5.4
Calcium	0.76	mg/L	1	0.05	0.01		GES	11/01/2023 12:10	EPA 200.8-1994, Rev. 5.4
Magnesium	1.85	mg/L	1	0.100	0.006		GES	11/01/2023 12:10	EPA 200.8-1994, Rev. 5.4
Potassium	1.74	mg/L	1	0.100	0.008		GES	11/01/2023 12:10	EPA 200.8-1994, Rev. 5.4
Sodium	5.54	mg/L	1	0.20	0.01		GES	11/01/2023 12:10	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233280 **Customer: Pirkey Power Station** **Date Reported: 12/08/2023**

Customer Sample ID: DUPLICATE C
Customer Description: TG-32
Lab Number: 233280-007
Preparation:
Date Collected: 10/18/2023 15:00 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.060	mg/L	1	0.050	0.007		GES	11/01/2023 12:15	EPA 200.8-1994, Rev. 5.4
Calcium	38.2	mg/L	1	0.05	0.01		GES	11/01/2023 12:15	EPA 200.8-1994, Rev. 5.4
Magnesium	33.5	mg/L	1	0.100	0.006		GES	11/01/2023 12:15	EPA 200.8-1994, Rev. 5.4
Potassium	7.17	mg/L	1	0.100	0.008		GES	11/01/2023 12:15	EPA 200.8-1994, Rev. 5.4
Sodium	14.2	mg/L	1	0.20	0.01		GES	11/01/2023 12:15	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: EQUIPMENT BLANK
Customer Description: TG-32
Lab Number: 233280-008
Preparation:
Date Collected: 10/18/2023 10:47 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	11/01/2023 12:20	EPA 200.8-1994, Rev. 5.4
Calcium	0.02	mg/L	1	0.05	0.01	J1	GES	11/01/2023 12:20	EPA 200.8-1994, Rev. 5.4
Magnesium	0.006	mg/L	1	0.100	0.006	J1	GES	11/01/2023 12:20	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	11/01/2023 12:20	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	11/01/2023 12:20	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: FIELD BLANK
Customer Description: TG-32
Lab Number: 233280-009
Preparation:
Date Collected: 10/18/2023 10:54 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	11/01/2023 12:25	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	11/01/2023 12:25	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	11/01/2023 12:25	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	11/01/2023 12:25	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	11/01/2023 12:25	EPA 200.8-1994, Rev. 5.4

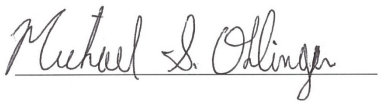
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233280 **Customer: Pirkey Power Station** **Date Reported: 12/08/2023**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - LF Metals
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Site Contact: | Date:

For Lab Use Only:
COC/Order #: 233280

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg,	Field-filter 250 mL bottle, then pH<2, HNO_3 Bi, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, Tl and Na, K, Mg, Sr	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Hg	250 mL Glass bottle, HCL**, pH<2 Hg		Sample Specific Notes:
AD-8	10/18/2023	1054	G	GW	1		X						
AD-16	10/18/2023	1142	G	GW	1		X						
AD-23	10/18/2023	845	G	GW	1		X						
AD-27	10/18/2023	1101	G	GW	1		X						
AD-34	10/18/2023	921	G	GW	1		X						
AD-36	10/18/2023	1008	G	GW	1		X						
DUPLICATE C	10/18/2023	1400	G	GW	1		X						
EQUIPMENT BLANK	10/18/2023	947	G	GW	1		X						
FIELD BLANK	10/18/2023	954	G	GW	1		X						
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Matt Hamilton	Eagle	10-19-23 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohly	Date/Time: 10/23/23 11:00

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 0

Opened By MGK /MSO **Number of Glass Containers:** –

Date/Time 10/23/23 11:00 **Number of Mercury Containers:** –

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial**: _____ on ice / (no ice)

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) N or N/A **Initial & Date**: MSO 10/23/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT# _____ (OR) Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 233280

Comments: _____

Logged by MSO _____

_____

Reviewed by MGK _____

_____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [•] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	12/7/2023
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233280

Prep Batch Number(s): PB23103102 QC2311013

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233280

Prep Batch Number(s): PB23103102 QC2311013

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233280

Prep Batch Number(s): PB23103102 QC2311013

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is CCB<2.2*MDL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-8
Customer Description: TG-32
Lab Number: 233269-001
Preparation:
Date Collected: 10/18/2023 11:54 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.01	mg/L	2	0.10	0.02		CRJ	11/13/2023 21:06	EPA 300.1 -1997, Rev. 1.0
Chloride	21.9	mg/L	2	0.04	0.01		CRJ	11/13/2023 21:06	EPA 300.1 -1997, Rev. 1.0
Fluoride	2.26	mg/L	2	0.06	0.02		CRJ	11/13/2023 21:06	EPA 300.1 -1997, Rev. 1.0
Sulfate	99.4	mg/L	2	0.6	0.1		CRJ	11/13/2023 21:06	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	230	mg/L	1	50	20		ELT	10/23/2023 08:40	SM 2540C-2015

Customer Sample ID: AD-16
Customer Description: TG-32
Lab Number: 233269-002
Preparation:
Date Collected: 10/18/2023 12:42 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.15	mg/L	2	0.10	0.02		CRJ	11/13/2023 22:45	EPA 300.1 -1997, Rev. 1.0
Chloride	22.0	mg/L	2	0.04	0.01		CRJ	11/13/2023 22:45	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	11/13/2023 22:45	EPA 300.1 -1997, Rev. 1.0
Sulfate	9.3	mg/L	2	0.6	0.1		CRJ	11/13/2023 22:45	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	97	mg/L	1	50	20		ELT	10/23/2023 08:40	SM 2540C-2015

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-23 Customer Description: TG-32
Lab Number: 233269-003 Preparation:
Date Collected: 10/18/2023 09:45 EDT Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.21	mg/L	2	0.10	0.02		CRJ	11/13/2023 23:17	EPA 300.1 -1997, Rev. 1.0
Chloride	7.99	mg/L	2	0.04	0.01		CRJ	11/13/2023 23:17	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	11/13/2023 23:17	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.7	mg/L	2	0.6	0.1		CRJ	11/13/2023 23:17	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	44	mg/L	1	50	20	J1	ELT	10/23/2023 08:46	SM 2540C-2015

Customer Sample ID: AD-27 Customer Description: TG-32
Lab Number: 233269-004 Preparation:
Date Collected: 10/18/2023 12:01 EDT Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	11/13/2023 23:50	EPA 300.1 -1997, Rev. 1.0
Chloride	12.1	mg/L	2	0.04	0.01		CRJ	11/13/2023 23:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.19	mg/L	2	0.06	0.02		CRJ	11/13/2023 23:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	61.5	mg/L	2	0.6	0.1		CRJ	11/13/2023 23:50	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	180	mg/L	1	50	20		ELT	10/24/2023 12:04	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-34
Customer Description: TG-32
Lab Number: 233269-005
Preparation:
Date Collected: 10/18/2023 10:21 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.22	mg/L	5	0.25	0.05	J1	CRJ	11/14/2023 01:29	EPA 300.1 -1997, Rev. 1.0
Chloride	7.33	mg/L	5	0.10	0.03		CRJ	11/14/2023 01:29	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.74	mg/L	5	0.15	0.05		CRJ	11/14/2023 01:29	EPA 300.1 -1997, Rev. 1.0
Sulfate	1160	mg/L	50	15	3		CRJ	11/14/2023 00:56	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	1620	mg/L	1	50	20		ELT	10/23/2023 09:25	SM 2540C-2015

Customer Sample ID: AD-36
Customer Description: TG-32
Lab Number: 233269-006
Preparation:
Date Collected: 10/18/2023 11:08 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.44	mg/L	2	0.10	0.02		CRJ	11/14/2023 02:35	EPA 300.1 -1997, Rev. 1.0
Chloride	12.4	mg/L	2	0.04	0.01		CRJ	11/14/2023 02:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	11/14/2023 02:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.1	mg/L	2	0.6	0.1		CRJ	11/14/2023 02:35	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	52	mg/L	1	50	20		ELT	10/23/2023 09:35	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: DUPLICATE C **Customer Description: TG-32**
Lab Number: 233269-007 **Preparation:**
Date Collected: 10/18/2023 15:00 EDT **Date Received: 10/20/2023 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.22	mg/L	5	0.25	0.05	J1	CRJ	11/14/2023 06:26	EPA 300.1 -1997, Rev. 1.0
Chloride	7.31	mg/L	5	0.10	0.03		CRJ	11/14/2023 06:26	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.74	mg/L	5	0.15	0.05		CRJ	11/14/2023 06:26	EPA 300.1 -1997, Rev. 1.0
Sulfate	1170	mg/L	50	15	3		CRJ	11/14/2023 05:53	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	1620	mg/L	1	50	20		ELT	10/23/2023 09:35	SM 2540C-2015

Customer Sample ID: EQUIPMENT BLANK **Customer Description: TG-32**
Lab Number: 233269-008 **Preparation:**
Date Collected: 10/18/2023 10:47 EDT **Date Received: 10/20/2023 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	11/14/2023 07:31	EPA 300.1 -1997, Rev. 1.0
Chloride	0.11	mg/L	2	0.04	0.01		CRJ	11/14/2023 07:31	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	11/14/2023 07:31	EPA 300.1 -1997, Rev. 1.0
Sulfate	0.1	mg/L	2	0.6	0.1	J1	CRJ	11/14/2023 07:31	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	ELT	10/23/2023 09:42	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: FIELD BLANK
Customer Description: TG-32
Lab Number: 233269-009
Preparation:
Date Collected: 10/18/2023 10:54 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

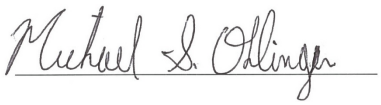
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	11/14/2023 08:04	EPA 300.1 -1997, Rev. 1.0
Chloride	0.11	mg/L	2	0.04	0.01		CRJ	11/14/2023 08:04	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	11/14/2023 08:04	EPA 300.1 -1997, Rev. 1.0
Sulfate	<0.1	mg/L	2	0.6	0.1	U1	CRJ	11/14/2023 08:04	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	ELT	10/23/2023 09:42	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233269 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Data Qualifer Legend

U1 - Not detected at or above method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - AD-34
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233269

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg,	Field-filter 250 mL bottle, then pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, Tl and Na, K, Mg, Sr	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg		Sample Specific Notes:
AD-8	10/18/2023	1054	G	GW	1				X					
AD-16	10/18/2023	1142	G	GW	1				X					
AD-23	10/18/2023	845	G	GW	1				X					
AD-27	10/18/2023	1101	G	GW	1				X					
AD-34	10/18/2023	921	G	GW	1				X					
AD-36	10/18/2023	1008	G	GW	1				X					
DUPLICATE C	10/18/2023	1400	G	GW	1				X					
EQUIPMENT BLANK	10/18/2023	947	G	GW	1				X					
FIELD BLANK	10/18/2023	954	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4	2	2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: Eagle	Date/Time: 10-19-23 1500	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohly	Date/Time: 10/20/23 10:00

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS FedEX USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 9

Opened By WCG MGK **Number of Glass Containers:** _____

Date/Time 10/20/23 1000 **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** WCG MGK (on ice) no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 11/17/23 If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or (N/A WLG) **Initial & Date:** WCG MGK 10/20/23

pH paper (circle one): MQuant.PN1.09535.0001.LOT# _____ (OR) Lab Rat.PN4801.LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 233269 Initial & Date & Time: _____

Comments _____

Logged by MSO _____

Reviewed by WCG _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger	Michael Ohlinger	Chemist	11/29/23
Name (printed)	Signature	Official Title	Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310189

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310189

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310189

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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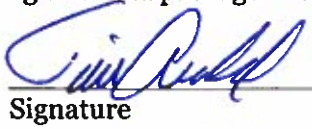
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold		Principle Chemist	11/15/2023
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/15/2023

Laboratory Job Number: 233269

Prep Batch Number(s): QC2311117

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/15/2023

Laboratory Job Number: 233269

Prep Batch Number(s): QC2311117

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/15/2023

Laboratory Job Number: 233269

Prep Batch Number(s): QC2311117

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger	Michael Ohlinger	Chemist	11/29/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310229; QC2310245

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310229, QC2310245

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233269

Prep Batch Number(s): QC2310229, QC2310245

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 233279-001
Preparation:
Date Collected: 10/18/2023 12:47 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.57	µg/L	1	0.10	0.03		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Barium	57.7	µg/L	1	0.20	0.05		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Beryllium	0.174	µg/L	1	0.050	0.007		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Boron	0.036	mg/L	1	0.050	0.007	J1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.016	µg/L	1	0.020	0.004	J1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Calcium	4.04	mg/L	1	0.05	0.01		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.33	µg/L	1	0.30	0.07		GES	11/06/2023 16:07	EPA 200.8-1994, Rev. 5.4
Cobalt	3.70	µg/L	1	0.020	0.005		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0587	mg/L	1	0.00030	0.00007		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Magnesium	2.07	mg/L	1	0.100	0.006		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Potassium	2.46	mg/L	1	0.100	0.008		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Selenium	0.04	µg/L	1	0.50	0.04	J1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Sodium	9.00	mg/L	1	0.20	0.01		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Strontium	0.0279	mg/L	1	0.00200	0.00005		GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	11/02/2023 19:29	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.64	pCi/L	0.14	0.19		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	83.6	%						
Radium-228	0.55	pCi/L	0.21	0.70		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	64.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 233279-001-01
Preparation: Dissolved
Date Collected: 10/18/2023 12:47 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Arsenic	0.37	µg/L	1	0.10	0.03		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Barium	59.8	µg/L	1	0.20	0.05		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Beryllium	0.171	µg/L	1	0.050	0.007		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Boron	0.041	mg/L	1	0.050	0.007	J1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Cadmium	0.015	µg/L	1	0.020	0.004	J1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Calcium	4.26	mg/L	1	0.05	0.01		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		GES	11/06/2023 16:12	EPA 200.8-1994, Rev. 5.4
Cobalt	3.97	µg/L	1	0.020	0.005		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Iron	2.85	mg/L	1	0.020	0.003		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Lithium	0.0610	mg/L	1	0.00030	0.00007		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Magnesium	2.20	mg/L	1	0.100	0.006		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Manganese	0.0532	mg/L	1	0.00100	0.00008		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Potassium	2.59	mg/L	1	0.100	0.008		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Sodium	9.46	mg/L	1	0.20	0.01		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Strontium	0.0291	mg/L	1	0.00200	0.00005		GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	11/02/2023 19:45	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-7R
Customer Description: TG-32
Lab Number: 233279-002
Preparation:
Date Collected: 10/17/2023 10:08 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Arsenic	1.22	µg/L	1	0.10	0.03		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Barium	64.2	µg/L	1	0.20	0.05		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Beryllium	1.64	µg/L	1	0.050	0.007		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Boron	0.089	mg/L	1	0.050	0.007		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Cadmium	0.324	µg/L	1	0.020	0.004		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Calcium	2.70	mg/L	1	0.05	0.01		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Chromium	0.64	µg/L	1	0.30	0.07		GES	11/06/2023 16:17	EPA 200.8-1994, Rev. 5.4
Cobalt	14.2	µg/L	1	0.020	0.005		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Lead	0.22	µg/L	1	0.20	0.05		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Lithium	0.0402	mg/L	1	0.00030	0.00007		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Magnesium	4.42	mg/L	1	0.100	0.006		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Mercury	41	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Potassium	1.52	mg/L	1	0.100	0.008		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Selenium	2.90	µg/L	1	0.50	0.04		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Sodium	19.0	mg/L	1	0.20	0.01		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Strontium	0.0325	mg/L	1	0.00200	0.00005		GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	11/02/2023 19:50	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.25	pCi/L	0.18	0.13		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.0	%						
Radium-228	2	pCi/L	0.20	0.59		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	69.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-7R
Customer Description: TG-32
Lab Number: 233279-002-01
Preparation: Dissolved
Date Collected: 10/17/2023 10:08 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.94	µg/L	1	0.10	0.03		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Barium	66.6	µg/L	1	0.20	0.05		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Beryllium	1.63	µg/L	1	0.050	0.007		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Boron	0.089	mg/L	1	0.050	0.007		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.348	µg/L	1	0.020	0.004		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Calcium	2.87	mg/L	1	0.05	0.01		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	11/06/2023 16:22	EPA 200.8-1994, Rev. 5.4
Cobalt	14.9	µg/L	1	0.020	0.005		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Iron	1.68	mg/L	1	0.020	0.003		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Lead	0.15	µg/L	1	0.20	0.05	J1	GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0408	mg/L	1	0.00030	0.00007		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Magnesium	4.65	mg/L	1	0.100	0.006		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Manganese	0.0412	mg/L	1	0.00100	0.00008		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Mercury	11	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Potassium	1.59	mg/L	1	0.100	0.008		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Selenium	2.84	µg/L	1	0.50	0.04		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Sodium	20.0	mg/L	1	0.20	0.01		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Strontium	0.0322	mg/L	1	0.00200	0.00005		GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	11/02/2023 19:55	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-12 Customer Description: TG-32
Lab Number: 233279-003 Preparation:
Date Collected: 10/17/2023 10:41 EDT Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.01	µg/L	1	0.100	0.008	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Arsenic	0.06	µg/L	1	0.10	0.03	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Barium	23.6	µg/L	1	0.20	0.05		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Beryllium	0.142	µg/L	1	0.050	0.007		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Boron	0.015	mg/L	1	0.050	0.007	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Cadmium	0.006	µg/L	1	0.020	0.004	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Calcium	0.27	mg/L	1	0.05	0.01		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	11/06/2023 16:27	EPA 200.8-1994, Rev. 5.4
Cobalt	1.19	µg/L	1	0.020	0.005		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Lithium	0.00891	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Magnesium	0.389	mg/L	1	0.100	0.006		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Potassium	0.431	mg/L	1	0.100	0.008		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Selenium	0.21	µg/L	1	0.50	0.04	J1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Sodium	4.93	mg/L	1	0.20	0.01		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Strontium	0.00286	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	11/02/2023 20:00	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.51	pCi/L	0.12	0.16		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.2	%						
Radium-228	0.57	pCi/L	0.22	0.72		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	62.5	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-12
Customer Description: TG-32
Lab Number: 233279-003-01
Preparation: Dissolved
Date Collected: 10/17/2023 10:41 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.012	µg/L	1	0.100	0.008	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Arsenic	0.06	µg/L	1	0.10	0.03	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Barium	23.4	µg/L	1	0.20	0.05		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Beryllium	0.133	µg/L	1	0.050	0.007		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Boron	0.014	mg/L	1	0.050	0.007	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Cadmium	0.008	µg/L	1	0.020	0.004	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Calcium	0.30	mg/L	1	0.05	0.01		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	11/06/2023 16:32	EPA 200.8-1994, Rev. 5.4
Cobalt	1.17	µg/L	1	0.020	0.005		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Iron	0.021	mg/L	1	0.020	0.003		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Lithium	0.00847	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Magnesium	0.397	mg/L	1	0.100	0.006		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Manganese	0.00420	mg/L	1	0.00100	0.00008		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Potassium	0.427	mg/L	1	0.100	0.008		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Selenium	0.13	µg/L	1	0.50	0.04	J1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Sodium	4.88	mg/L	1	0.20	0.01		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Strontium	0.00295	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	11/02/2023 20:05	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 233279-004
Preparation:
Date Collected: 10/17/2023 09:11 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Arsenic	5.71	µg/L	1	0.10	0.03		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Barium	41.2	µg/L	1	0.20	0.05		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Beryllium	0.559	µg/L	1	0.050	0.007		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Boron	0.068	mg/L	1	0.050	0.007		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Calcium	9.49	mg/L	1	0.05	0.01		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Chromium	0.22	µg/L	1	0.30	0.07	J1	GES	11/06/2023 16:37	EPA 200.8-1994, Rev. 5.4
Cobalt	47.6	µg/L	1	0.020	0.005		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Lithium	0.137	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Magnesium	14.1	mg/L	1	0.100	0.006		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Potassium	5.13	mg/L	1	0.100	0.008		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Selenium	0.13	µg/L	1	0.50	0.04	J1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Sodium	22.0	mg/L	1	0.20	0.01		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Strontium	0.0428	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	11/02/2023 20:10	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.05	pCi/L	0.17	0.14		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.7	%						
Radium-228	-0.65	pCi/L	0.22	0.76		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	67.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 233279-004-01
Preparation: Dissolved
Date Collected: 10/17/2023 09:11 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Arsenic	1.80	µg/L	1	0.10	0.03		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Barium	39.0	µg/L	1	0.20	0.05		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Beryllium	0.267	µg/L	1	0.050	0.007		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Boron	0.068	mg/L	1	0.050	0.007		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Calcium	9.34	mg/L	1	0.05	0.01		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Chromium	0.5	µg/L	2	0.6	0.1	J1	GES	11/06/2023 16:43	EPA 200.8-1994, Rev. 5.4
Cobalt	46.7	µg/L	1	0.020	0.005		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Iron	44.3	mg/L	2	0.040	0.006		GES	11/06/2023 16:43	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Lithium	0.135	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Magnesium	13.8	mg/L	1	0.100	0.006		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Manganese	0.480	mg/L	1	0.00100	0.00008		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Potassium	5.04	mg/L	1	0.100	0.008		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Sodium	21.4	mg/L	1	0.20	0.01		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Strontium	0.0419	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	11/02/2023 20:15	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 233279-005
Preparation:
Date Collected: 10/17/2023 13:11 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Barium	249	µg/L	1	0.20	0.05		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Beryllium	0.667	µg/L	1	0.050	0.007		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Boron	0.023	mg/L	1	0.050	0.007	J1	GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Cadmium	0.054	µg/L	1	0.020	0.004		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Calcium	0.94	mg/L	1	0.05	0.01		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	11/06/2023 16:48	EPA 200.8-1994, Rev. 5.4
Cobalt	11.0	µg/L	1	0.020	0.005		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Lithium	0.0244	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Magnesium	4.05	mg/L	1	0.100	0.006		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Mercury	196	ng/L	4	20	7		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Potassium	1.08	mg/L	1	0.100	0.008		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Selenium	0.58	µg/L	1	0.50	0.04		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Sodium	7.75	mg/L	1	0.20	0.01		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Strontium	0.0193	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	11/02/2023 20:21	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.11	pCi/L	0.23	0.13		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.7	%						
Radium-228	3.28	pCi/L	0.19	0.53		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	81.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 233279-005-01
Preparation: Dissolved
Date Collected: 10/17/2023 13:11 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Arsenic	0.20	µg/L	1	0.10	0.03		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Barium	251	µg/L	1	0.20	0.05		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Beryllium	0.664	µg/L	1	0.050	0.007		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Boron	0.023	mg/L	1	0.050	0.007	J1	GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Cadmium	0.051	µg/L	1	0.020	0.004		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Calcium	1.01	mg/L	1	0.05	0.01		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	GES	11/06/2023 16:53	EPA 200.8-1994, Rev. 5.4
Cobalt	11.2	µg/L	1	0.020	0.005		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Iron	0.032	mg/L	1	0.020	0.003		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Lead	0.14	µg/L	1	0.20	0.05	J1	GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Lithium	0.0243	mg/L	1	0.00030	0.00007		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Magnesium	4.15	mg/L	1	0.100	0.006		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Manganese	0.0381	mg/L	1	0.00100	0.00008		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Potassium	1.12	mg/L	1	0.100	0.008		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Selenium	0.63	µg/L	1	0.50	0.04		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Sodium	7.96	mg/L	1	0.20	0.01		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Strontium	0.0195	mg/L	1	0.00200	0.00005		GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	11/02/2023 20:26	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 233279-006
Preparation:
Date Collected: 10/18/2023 08:47 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.023	µg/L	1	0.100	0.008	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Arsenic	0.43	µg/L	1	0.10	0.03		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Barium	84.0	µg/L	1	0.20	0.05		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Beryllium	0.127	µg/L	1	0.050	0.007		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Boron	0.011	mg/L	1	0.050	0.007	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Cadmium	0.018	µg/L	1	0.020	0.004	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Calcium	0.35	mg/L	1	0.05	0.01		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.52	µg/L	1	0.30	0.07		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Cobalt	1.26	µg/L	1	0.020	0.005		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.0186	mg/L	1	0.00030	0.00007		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Magnesium	0.407	mg/L	1	0.100	0.006		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Mercury	84	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Potassium	1.03	mg/L	1	0.100	0.008		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Selenium	0.17	µg/L	1	0.50	0.04	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Sodium	5.98	mg/L	1	0.20	0.01		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Strontium	0.00612	mg/L	1	0.00200	0.00005		GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	11/02/2023 21:53	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.78	pCi/L	0.14	0.13		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.4	%						
Radium-228	0.49	pCi/L	0.17	0.58		ST	11/16/2023 16:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	64.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 233279-006-01
Preparation: Dissolved
Date Collected: 10/18/2023 08:47 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Arsenic	0.06	µg/L	1	0.10	0.03	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Barium	82.9	µg/L	1	0.20	0.05		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Beryllium	0.124	µg/L	1	0.050	0.007		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Boron	0.013	mg/L	1	0.050	0.007	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Cadmium	0.016	µg/L	1	0.020	0.004	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Calcium	0.37	mg/L	1	0.05	0.01		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Cobalt	1.21	µg/L	1	0.020	0.005		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Iron	0.107	mg/L	1	0.020	0.003		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Lithium	0.0186	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Magnesium	0.389	mg/L	1	0.100	0.006		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Manganese	0.00719	mg/L	1	0.00100	0.00008		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Mercury	15	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Potassium	1.00	mg/L	1	0.100	0.008		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Selenium	0.1	µg/L	1	0.50	0.04	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Sodium	5.88	mg/L	1	0.20	0.01		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Strontium	0.00572	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4
Thallium	0.06	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:08	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-22
Customer Description: TG-32
Lab Number: 233279-007
Preparation:
Date Collected: 10/17/2023 11:15 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Arsenic	1.57	µg/L	1	0.10	0.03		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Barium	19.1	µg/L	1	0.20	0.05		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Beryllium	2.65	µg/L	1	0.050	0.007		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Boron	0.020	mg/L	1	0.050	0.007	J1	GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.551	µg/L	1	0.020	0.004		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Calcium	9.26	mg/L	1	0.05	0.01		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.33	µg/L	1	0.30	0.07		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Cobalt	55.3	µg/L	1	0.020	0.005		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Lead	0.18	µg/L	1	0.20	0.05	J1	GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0772	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Magnesium	14.3	mg/L	1	0.100	0.006		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Mercury	301	ng/L	4	20	7		RLP	10/30/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Potassium	3.03	mg/L	1	0.100	0.008		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Selenium	4.78	µg/L	1	0.50	0.04		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Sodium	76.9	mg/L	1	0.20	0.01		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Strontium	0.0892	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:14	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.93	pCi/L	0.16	0.17		ST	11/20/2023 12:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.4	%						
Radium-228	1.68	pCi/L	0.18	0.55		ST	11/17/2023 16:32	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	71.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Dolan Chemical Laboratory
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Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-22
Customer Description: TG-32
Lab Number: 233279-007-01
Preparation: Dissolved
Date Collected: 10/17/2023 11:15 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Arsenic	1.49	µg/L	1	0.10	0.03		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Barium	18.8	µg/L	1	0.20	0.05		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Beryllium	2.62	µg/L	1	0.050	0.007		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Boron	0.019	mg/L	1	0.050	0.007	J1	GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Cadmium	0.540	µg/L	1	0.020	0.004		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Calcium	9.33	mg/L	1	0.05	0.01		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Cobalt	55.1	µg/L	1	0.020	0.005		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Iron	20.1	mg/L	1	0.020	0.003		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Lead	0.17	µg/L	1	0.20	0.05	J1	GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.0783	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Magnesium	14.3	mg/L	1	0.100	0.006		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Manganese	0.250	mg/L	1	0.00100	0.00008		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Mercury	40	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Potassium	3.02	mg/L	1	0.100	0.008		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Selenium	4.79	µg/L	1	0.50	0.04		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Sodium	77.5	mg/L	1	0.20	0.01		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Strontium	0.0878	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:19	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-28
Customer Description: TG-32
Lab Number: 233279-008
Preparation:
Date Collected: 10/17/2023 12:14 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Arsenic	0.16	µg/L	1	0.10	0.03		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Barium	114	µg/L	1	0.20	0.05		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Beryllium	0.469	µg/L	1	0.050	0.007		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Boron	0.294	mg/L	1	0.050	0.007		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Cadmium	0.043	µg/L	1	0.020	0.004		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Calcium	1.23	mg/L	1	0.05	0.01		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Chromium	0.42	µg/L	1	0.30	0.07		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Cobalt	10.9	µg/L	1	0.020	0.005		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.0262	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Magnesium	2.51	mg/L	1	0.100	0.006		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Mercury	9	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Potassium	0.795	mg/L	1	0.100	0.008		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Selenium	0.22	µg/L	1	0.50	0.04	J1	GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Sodium	5.54	mg/L	1	0.20	0.01		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Strontium	0.0178	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:24	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.10	pCi/L	0.17	0.14		ST	11/20/2023 09:08	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.7	%						
Radium-228	1.21	pCi/L	0.15	0.45		ST	11/17/2023 16:32	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
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Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-28
Customer Description: TG-32
Lab Number: 233279-008-01
Preparation: Dissolved
Date Collected: 10/17/2023 12:14 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Barium	118	µg/L	1	0.20	0.05		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Beryllium	0.468	µg/L	1	0.050	0.007		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Boron	0.312	mg/L	1	0.050	0.007		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.045	µg/L	1	0.020	0.004		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Calcium	1.39	mg/L	1	0.05	0.01		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.63	µg/L	1	0.30	0.07		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Cobalt	11.6	µg/L	1	0.020	0.005		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Iron	0.253	mg/L	1	0.020	0.003		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0265	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Magnesium	2.71	mg/L	1	0.100	0.006		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Manganese	0.0511	mg/L	1	0.00100	0.00008		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Mercury	5	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Potassium	0.866	mg/L	1	0.100	0.008		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Selenium	0.20	µg/L	1	0.50	0.04	J1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Sodium	5.97	mg/L	1	0.20	0.01		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Strontium	0.0185	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:29	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 233279-009
Preparation:
Date Collected: 10/17/2023 11:34 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Arsenic	0.17	µg/L	1	0.10	0.03		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Barium	63.8	µg/L	1	0.20	0.05		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Beryllium	0.090	µg/L	1	0.050	0.007		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Boron	2.07	mg/L	1	0.050	0.007		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.01	µg/L	1	0.020	0.004	J1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Calcium	0.79	mg/L	1	0.05	0.01		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.44	µg/L	1	0.30	0.07		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Cobalt	4.11	µg/L	1	0.020	0.005		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Lithium	0.0124	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Magnesium	2.19	mg/L	1	0.100	0.006		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Mercury	5	ng/L	1	5	2		RLP	10/30/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Potassium	0.931	mg/L	1	0.100	0.008		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Selenium	0.42	µg/L	1	0.50	0.04	J1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Sodium	77.4	mg/L	1	0.20	0.01		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Strontium	0.0103	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:34	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.99	pCi/L	0.18	0.17		ST	11/20/2023 09:08	SW-846 9315-1986, Rev. 0
Carrier Recovery	78.5	%						
Radium-228	-0.14	pCi/L	0.18	0.63		ST	11/17/2023 16:32	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	71.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 233279-009-01
Preparation: Dissolved
Date Collected: 10/17/2023 11:34 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Arsenic	0.14	µg/L	1	0.10	0.03		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Barium	53.8	µg/L	1	0.20	0.05		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Beryllium	0.088	µg/L	1	0.050	0.007		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Boron	2.06	mg/L	1	0.050	0.007		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Cadmium	0.01	µg/L	1	0.020	0.004	J1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Calcium	0.83	mg/L	1	0.05	0.01		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Chromium	0.42	µg/L	1	0.30	0.07		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Cobalt	4.13	µg/L	1	0.020	0.005		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Iron	0.250	mg/L	1	0.020	0.003		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Lithium	0.0123	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Magnesium	2.18	mg/L	1	0.100	0.006		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Manganese	0.0234	mg/L	1	0.00100	0.00008		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Potassium	0.935	mg/L	1	0.100	0.008		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Selenium	0.33	µg/L	1	0.50	0.04	J1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Sodium	76.8	mg/L	1	0.20	0.01		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Strontium	0.0102	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:39	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 233279-010
Preparation:
Date Collected: 10/17/2023 12:10 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Arsenic	0.58	µg/L	1	0.10	0.03		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Barium	45.9	µg/L	1	0.20	0.05		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Beryllium	1.00	µg/L	1	0.050	0.007		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Boron	0.094	mg/L	1	0.050	0.007		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Cadmium	0.037	µg/L	1	0.020	0.004		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Calcium	1.15	mg/L	1	0.05	0.01		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Chromium	0.33	µg/L	1	0.30	0.07		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Cobalt	7.51	µg/L	1	0.020	0.005		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Lead	0.22	µg/L	1	0.20	0.05		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Lithium	0.0194	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Magnesium	2.95	mg/L	1	0.100	0.006		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Mercury	6120	ng/L	100	500	200		RLP	10/30/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Potassium	0.283	mg/L	1	0.100	0.008		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Selenium	1.97	µg/L	1	0.50	0.04		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Sodium	15.1	mg/L	1	0.20	0.01		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Strontium	0.0223	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:44	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1	pCi/L	0.17	0.17		ST	11/20/2023 09:08	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.1	%						
Radium-228	0.79	pCi/L	0.16	0.53		ST	11/17/2023 16:32	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
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Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 233279-010-01
Preparation: Dissolved
Date Collected: 10/17/2023 12:10 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Arsenic	0.50	µg/L	1	0.10	0.03		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Barium	44.3	µg/L	1	0.20	0.05		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Beryllium	0.977	µg/L	1	0.050	0.007		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Boron	0.086	mg/L	1	0.050	0.007		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Cadmium	0.037	µg/L	1	0.020	0.004		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Calcium	1.14	mg/L	1	0.05	0.01		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Cobalt	7.12	µg/L	1	0.020	0.005		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Iron	0.057	mg/L	1	0.020	0.003		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Lead	0.21	µg/L	1	0.20	0.05		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Lithium	0.0191	mg/L	1	0.00030	0.00007		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Magnesium	2.75	mg/L	1	0.100	0.006		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Manganese	0.00547	mg/L	1	0.00100	0.00008		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Mercury	110	ng/L	2	10	4		RLP	10/30/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Potassium	0.284	mg/L	1	0.100	0.008		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Selenium	2.00	µg/L	1	0.50	0.04		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Sodium	14.5	mg/L	1	0.20	0.01		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Strontium	0.0214	mg/L	1	0.00200	0.00005		GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	11/02/2023 22:49	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: DUPLICATE A
Customer Description: TG-32
Lab Number: 233279-011
Preparation:
Date Collected: 10/17/2023 15:00 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Arsenic	1.23	µg/L	1	0.10	0.03		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Barium	66.8	µg/L	1	0.20	0.05	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Beryllium	1.61	µg/L	1	0.050	0.007	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Boron	0.090	mg/L	1	0.050	0.007		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.378	µg/L	1	0.020	0.004		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Calcium	2.85	mg/L	1	0.05	0.01	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.47	µg/L	1	0.30	0.07		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Cobalt	16.3	µg/L	1	0.020	0.005	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Lead	0.19	µg/L	1	0.20	0.05	J1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0399	mg/L	1	0.00030	0.00007	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Magnesium	4.82	mg/L	1	0.100	0.006	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Mercury	33	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Potassium	1.62	mg/L	1	0.100	0.008		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Selenium	3.35	µg/L	1	0.50	0.04		GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Sodium	21.3	mg/L	1	0.20	0.01	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Strontium	0.0335	mg/L	1	0.00200	0.00005	M1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	10/30/2023 20:14	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: DUPLICATE A
Customer Description: TG-32
Lab Number: 233279-011-01
Preparation: Dissolved
Date Collected: 10/17/2023 15:00 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Arsenic	1.06	µg/L	1	0.10	0.03		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Barium	65.7	µg/L	1	0.20	0.05		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Beryllium	1.58	µg/L	1	0.050	0.007		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Boron	0.089	mg/L	1	0.050	0.007		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Cadmium	0.378	µg/L	1	0.020	0.004		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Calcium	2.78	mg/L	1	0.05	0.01		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Chromium	0.39	µg/L	1	0.30	0.07		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Cobalt	16.0	µg/L	1	0.020	0.005		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Iron	1.84	mg/L	1	0.020	0.003		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Lead	0.15	µg/L	1	0.20	0.05	J1	GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Lithium	0.0394	mg/L	1	0.00030	0.00007		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Magnesium	4.72	mg/L	1	0.100	0.006		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Manganese	0.0427	mg/L	1	0.00100	0.00008		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Mercury	14	ng/L	1	5	2		RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Potassium	1.58	mg/L	1	0.100	0.008		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Selenium	3.19	µg/L	1	0.50	0.04		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Sodium	20.8	mg/L	1	0.20	0.01		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Strontium	0.0330	mg/L	1	0.00200	0.00005		GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.02	J1	GES	10/30/2023 21:20	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: EQUIPMENT BLANK
Customer Description: TG-32
Lab Number: 233279-012
Preparation:
Date Collected: 10/17/2023 11:15 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Cobalt	0.035	µg/L	1	0.020	0.005		GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/30/2023 21:25	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

Customer Sample ID: FIELD BLANK
Customer Description: TG-32
Lab Number: 233279-013
Preparation:
Date Collected: 10/17/2023 11:18 EDT
Date Received: 10/23/2023 11:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Chromium	0.51	µg/L	1	0.30	0.07		GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Cobalt	0.045	µg/L	1	0.020	0.005		GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/26/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/30/2023 21:30	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.32	pCi/L	0.09	0.16		ST	11/20/2023 09:08	SW-846 9315-1986, Rev. 0
Carrier Recovery	101	%						
Radium-228	0.07	pCi/L	0.14	0.47		ST	11/17/2023 16:32	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

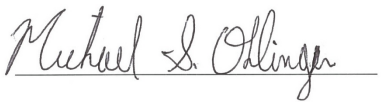
Job ID: 233279 **Customer: Pirkey Power Station** **Date Reported: 12/12/2023**

233279-005-01
Comments:

Hg bottle was broken upon arrival.

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

U1 - Not detected at or above method detection limit (MDL).
J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
M1 - The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - CCR Metals
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233279

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL and Na, K, Mg, Sr	Field-filter 250 mL bottle, then pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Hg	250 mL Glass bottle, HCL**, pH<2 Hg		Sample Specific Notes:
AD-3	10/18/2023	1147	G	GW	7		X	X	X	X	X		
AD-7R	10/17/2023	908	G	GW	10		X	X	X	X	X		
AD-12	10/17/2023	941	G	GW	7		X	X	X	X	X		
AD-13	10/17/2023	811	G	GW	7		X	X	X	X	X		
AD-17	10/17/2023	1211	G	GW	7		X	X	X	X	X		
AD-18	10/18/2023	747	G	GW	7		X	X	X	X	X		
AD-22	10/17/2023	1015	G	GW	7		X	X	X	X	X		
AD-28	10/17/2023	1114	G	GW	7		X	X	X	X	X		
AD-30	10/17/2023	1034	G	GW	7		X	X	X	X	X		
AD-33	10/17/2023	1110	G	GW	7		X	X	X	X	X		
DUPLICATE A	10/17/2023	1400	G	GW	4		X	X		X	X		
EQUIPMENT BLANK	10/17/2023	1015	G	GW	2		X			X			
FIELD BLANK	10/17/2023	1018	G	GW	5		X		X	X			
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Bob Hamilton	Eng	10-19-23 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 10/23/23 1100

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pilgrim **Number of Plastic Containers:** 44

Opened By MGK/MSO **Number of Glass Containers:** 24

Date/Time 10/23/23 11:00 **Number of Mercury Containers:** —

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial**: _____ on ice / ~~no ice~~

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) N Comments _____

Was Chain of Custody received? (Y) N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) N Comments _____

Were samples labeled properly? (Y) N Comments _____

Were correct containers used? (Y) N Comments _____ 10/24/23 MSO 10/24/23 MSO 10/23/23

Was pH checked & Color Coding done? (Y) N or N/A **Initial & Date**: Jacob 10/25/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y /(N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y /(N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 233279 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

_____

Reviewed by MGK _____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pilot Rock **Number of Plastic Containers:** 16

Opened By MSJ **Number of Glass Containers:** –

Date/Time ~~10/23~~ 10/24/23 12:00PM MSJ 10/24/23 **Number of Mercury Containers:** –

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / (no ice)

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MSJ 10/24/23

pH paper (circle one): MQuant,PN1.09535.0001 LOT# _____ [OR] Lab Rat,PN4801 LOT# ~~X000RWBGZT~~ Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 238279 Initial & Date & Time : _____

Logged by MSJ Comments: _____

Reviewed by MBK _____

_____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Susann Sulzmann	S. Sulzmann	Senior Chemist	12-7-2023
Name (printed)	Signature	Official Title	Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 12-7-2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102509, PB23102510

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 12-7-2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102509, PB23102510

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?		
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Susann Sulzmann

LRC Date: 12-7-2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102509, PB23102510

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- [x] R2 Sample identification cross-reference
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  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [•] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	12/7/2023
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102703 PB23110202 PB23110205 PB23110603 QC2310261 QC2311029 QC2311063

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	No	ER3
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102703 PB23110202 PB23110205 PB23110603 QC2310261 QC2311029 QC2311063

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 12/7/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23102703 PB23110202 PB23110205 PB23110603 QC2310261 QC2311029 QC2311063

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is CCB<2.2*MDL.
ER3	Sample 233279-011 failed to meet acceptance criteria on Matrix spike for Ca Li Ba Be Co Na Mg Sr

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha T. Palmer	Tamisha T. Palmer	Chemical Tech. Principal	12/08/2023
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 12/08/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111406, PB23111407

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	No	ER1
	I	Were analytical duplicates analyzed at the appropriate frequency?	No	ER1
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	No	ER1
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 12/08/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111406, PB23111407

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 12/08/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111406, PB23111407

Exception Report No.	Description
ER1	Both batches did not have samples available for duplicates.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha T. Palmer	Tamisha T. Palmer	Chemical Tech. Principal	12/08/2023
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Tamisha Palmer

LRC Date: 12/11/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111102, PB23111103

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	ER1
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	ER1
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	ER1
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	ER1
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	NA	
	I	Were analytical duplicates analyzed at the appropriate frequency?	NA	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Tamisha Palmer

LRC Date: 12/11/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111102, PB23111103

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey

Reviewer Name: Tamisha Palmer

LRC Date: 12/11/2023

Laboratory Job Number: 233279

Prep Batch Number(s): PB23111102, PB23111103

Exception Report No.	Description
ER1	PB23111103- there was no MS, MSD associated with prep batch.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-3 Customer Description: TG-32
Lab Number: 233267-001 Preparation:
Date Collected: 10/18/2023 12:47 EDT Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.05	mg/L	2	0.10	0.02	J1	CRJ	11/10/2023 16:27	EPA 300.1 -1997, Rev. 1.0
Chloride	6.17	mg/L	2	0.04	0.01		CRJ	11/10/2023 16:27	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	11/10/2023 16:27	EPA 300.1 -1997, Rev. 1.0
Sulfate	28.6	mg/L	2	0.6	0.1		CRJ	11/10/2023 16:27	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	5	mg/L	1	20	5	J1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	140	mg/L	1	50	20		ELT	10/23/2023 07:40	SM 2540C-2015

Customer Sample ID: AD-7R Customer Description: TG-32
Lab Number: 233267-002 Preparation:
Date Collected: 10/17/2023 10:08 EDT Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.12	mg/L	2	0.10	0.02		CRJ	11/10/2023 18:50	EPA 300.1 -1997, Rev. 1.0
Chloride	24.1	mg/L	2	0.04	0.01		CRJ	11/10/2023 18:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	2	0.06	0.02		CRJ	11/10/2023 18:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	39.9	mg/L	2	0.6	0.1		CRJ	11/10/2023 18:50	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	190	mg/L	1	50	20		ELT	10/23/2023 07:40	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-12
Customer Description: TG-32
Lab Number: 233267-003
Preparation:
Date Collected: 10/17/2023 10:41 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.09	mg/L	2	0.10	0.02	J1	CRJ	11/10/2023 19:26	EPA 300.1 -1997, Rev. 1.0
Chloride	6.74	mg/L	2	0.04	0.01		CRJ	11/10/2023 19:26	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	11/10/2023 19:26	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.7	mg/L	2	0.6	0.1		CRJ	11/10/2023 19:26	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	58	mg/L	1	50	20		ELT	10/23/2023 07:40	SM 2540C-2015

Customer Sample ID: AD-13
Customer Description: TG-32
Lab Number: 233267-004
Preparation:
Date Collected: 10/17/2023 09:11 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.23	mg/L	2	0.10	0.02		CRJ	11/10/2023 17:39	EPA 300.1 -1997, Rev. 1.0
Chloride	42.9	mg/L	10	0.20	0.05		CRJ	11/10/2023 17:03	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.45	mg/L	2	0.06	0.02		CRJ	11/10/2023 17:39	EPA 300.1 -1997, Rev. 1.0
Sulfate	86.9	mg/L	10	3.0	0.6		CRJ	11/10/2023 17:03	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	47	mg/L	1	20	5		MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	280	mg/L	1	50	20		ELT	10/23/2023 08:01	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 233267-005
Preparation:
Date Collected: 10/17/2023 13:11 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.13	mg/L	2	0.10	0.02		CRJ	11/10/2023 20:02	EPA 300.1 -1997, Rev. 1.0
Chloride	29.7	mg/L	2	0.04	0.01		CRJ	11/10/2023 20:02	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.27	mg/L	2	0.06	0.02		CRJ	11/10/2023 20:02	EPA 300.1 -1997, Rev. 1.0
Sulfate	1.6	mg/L	2	0.6	0.1		CRJ	11/10/2023 20:02	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	77	mg/L	1	50	20		ELT	10/23/2023 08:07	SM 2540C-2015

Customer Sample ID: AD-18
Customer Description: TG-32
Lab Number: 233267-006
Preparation:
Date Collected: 10/18/2023 08:47 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.03	mg/L	2	0.10	0.02	J1	CRJ	11/10/2023 22:26	EPA 300.1 -1997, Rev. 1.0
Chloride	5.05	mg/L	2	0.04	0.01		CRJ	11/10/2023 22:26	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	11/10/2023 22:26	EPA 300.1 -1997, Rev. 1.0
Sulfate	10	mg/L	2	0.6	0.1		CRJ	11/10/2023 22:26	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	98	mg/L	1	50	20		ELT	10/23/2023 08:07	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-22
Customer Description: TG-32
Lab Number: 233267-007
Preparation:
Date Collected: 10/17/2023 11:15 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.60	mg/L	2	0.10	0.02		CRJ	11/11/2023 02:37	EPA 300.1 -1997, Rev. 1.0
Chloride	80.5	mg/L	25	0.5	0.1		CRJ	11/10/2023 20:38	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.26	mg/L	2	0.06	0.02		CRJ	11/11/2023 02:37	EPA 300.1 -1997, Rev. 1.0
Sulfate	212	mg/L	25	8	2		CRJ	11/10/2023 20:38	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	480	mg/L	1	50	20		ELT	10/23/2023 08:07	SM 2540C-2015

Customer Sample ID: AD-28
Customer Description: TG-32
Lab Number: 233267-008
Preparation:
Date Collected: 10/17/2023 12:14 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.06	mg/L	2	0.10	0.02	J1	CRJ	11/11/2023 06:48	EPA 300.1 -1997, Rev. 1.0
Chloride	4.64	mg/L	2	0.04	0.01		CRJ	11/11/2023 06:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.50	mg/L	2	0.06	0.02		CRJ	11/11/2023 06:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	22.1	mg/L	2	0.6	0.1		CRJ	11/11/2023 06:48	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	94	mg/L	1	50	20		ELT	10/23/2023 08:14	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: AD-30
Customer Description: TG-32
Lab Number: 233267-009
Preparation:
Date Collected: 10/17/2023 11:34 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.23	mg/L	2	0.10	0.02		CRJ	11/11/2023 02:01	EPA 300.1 -1997, Rev. 1.0
Chloride	26.7	mg/L	2	0.04	0.01		CRJ	11/11/2023 02:01	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	11/11/2023 02:01	EPA 300.1 -1997, Rev. 1.0
Sulfate	148	mg/L	10	3.0	0.6		CRJ	11/10/2023 21:50	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	290	mg/L	1	50	20		ELT	10/23/2023 08:14	SM 2540C-2015

Customer Sample ID: AD-33
Customer Description: TG-32
Lab Number: 233267-010
Preparation:
Date Collected: 10/17/2023 12:10 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.22	mg/L	2	0.10	0.02		CRJ	11/11/2023 07:24	EPA 300.1 -1997, Rev. 1.0
Chloride	9.03	mg/L	2	0.04	0.01		CRJ	11/11/2023 07:24	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.18	mg/L	2	0.06	0.02		CRJ	11/11/2023 07:24	EPA 300.1 -1997, Rev. 1.0
Sulfate	41.7	mg/L	2	0.6	0.1		CRJ	11/11/2023 07:24	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	130	mg/L	1	50	20		ELT	10/23/2023 08:14	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: DUPLICATE A **Customer Description: TG-32**
Lab Number: 233267-011 **Preparation:**
Date Collected: 10/17/2023 15:00 EDT **Date Received: 10/20/2023 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.16	mg/L	2	0.10	0.02		CRJ	11/11/2023 05:36	EPA 300.1 -1997, Rev. 1.0
Chloride	24.4	mg/L	2	0.04	0.01		CRJ	11/11/2023 05:36	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	2	0.06	0.02		CRJ	11/11/2023 05:36	EPA 300.1 -1997, Rev. 1.0
Sulfate	39.9	mg/L	2	0.6	0.1		CRJ	11/11/2023 05:36	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	160	mg/L	1	50	20		ELT	10/23/2023 08:14	SM 2540C-2015

Customer Sample ID: EQUIPMENT BLANK **Customer Description: TG-32**
Lab Number: 233267-012 **Preparation:**
Date Collected: 10/17/2023 11:15 EDT **Date Received: 10/20/2023 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	11/11/2023 03:48	EPA 300.1 -1997, Rev. 1.0
Chloride	0.13	mg/L	2	0.04	0.01		CRJ	11/11/2023 03:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	11/11/2023 03:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	0.2	mg/L	2	0.6	0.1	J1	CRJ	11/11/2023 03:48	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	ELT	10/23/2023 08:21	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Customer Sample ID: FIELD BLANK
Customer Description: TG-32
Lab Number: 233267-013
Preparation:
Date Collected: 10/17/2023 11:18 EDT
Date Received: 10/20/2023 10:00 EDT

Ion Chromatography

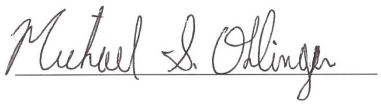
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	11/11/2023 04:24	EPA 300.1 -1997, Rev. 1.0
Chloride	0.13	mg/L	2	0.04	0.01		CRJ	11/11/2023 04:24	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	11/11/2023 04:24	EPA 300.1 -1997, Rev. 1.0
Sulfate	0.2	mg/L	2	0.6	0.1	J1	CRJ	11/11/2023 04:24	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/23/2023 15:48	SM 2320B-2011
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	ELT	10/23/2023 08:21	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233267 **Customer: Pirkey Power Station** **Date Reported: 11/29/2023**

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233267

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 — B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL and Na, K, Mg, Sr	Field-filter 250 mL bottle, then pH<2, HNO_3 — B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	1 L bottle, Cool, 0-6°C — TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 — Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 — Hg	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 — Hg	Sample Specific Notes:
AD-3	10/18/2023	1147	G	GW	1				X				
AD-7R	10/17/2023	908	G	GW	1				X				
AD-12	10/17/2023	941	G	GW	1				X				
AD-13	10/17/2023	811	G	GW	1				X				
AD-17	10/17/2023	1211	G	GW	1				X				
AD-18	10/18/2023	747	G	GW	1				X				
AD-22	10/17/2023	1015	G	GW	1				X				
AD-28	10/17/2023	1114	G	GW	1				X				
AD-30	10/17/2023	1034	G	GW	1				X				
AD-33	10/17/2023	1110	G	GW	1				X				
DUPLICATE A	10/17/2023	1400	G	GW	1				X				
EQUIPMENT BLANK	10/17/2023	1015	G	GW	1				X				
FIELD BLANK	10/17/2023	1018	G	GW	1				X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4	2	2	

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Matt Hamilton	Eagle	10-19-23 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 10/20/23 12:00

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS FedEX USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 13

Opened By WCG MGK **Number of Glass Containers:** _____

Date/Time 10/20/23 1000 **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** WCG MGK (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 11/17/23 If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or (N/A WLG) **Initial & Date:** WCG MGK 10/20/23

pH paper (circle one): MQuant.PN1.09535.0001.LOT# _____ [OR] Lab Rat.PN4801.LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 233267 Initial & Date & Time: _____

Comments: _____

Logged by MSO _____

Reviewed by WCG _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

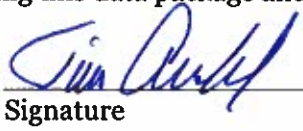
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold		Principle Chemistr	11/13/2023
Name (printed)	Signature	Official Title	Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/13/2023

Laboratory Job Number: 233267

Prep Batch Number(s): QC2311105

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/13/2023

Laboratory Job Number: 233267

Prep Batch Number(s): QC2311105

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Tim Arnold

LRC Date: 11/13/2023

Laboratory Job Number: 233267

Prep Batch Number(s): QC2311105

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
[3] NA - Not applicable; NR - Not reviewed.
[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

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- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger	Michael Ohlinger	Chemist	11/29/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310229

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310229

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310229

Exception Report No.	Description

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- [x] R2 Sample identification cross-reference
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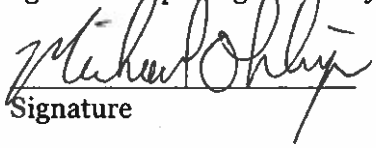
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [NA] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - (a) LCS spiking amounts
  - (b) Calculated %R for each analyte
  - (c) The laboratory's LCS QC limits
- [x] R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - (a) Samples associated with the MS/MSD clearly identified
  - (b) MS/MSD spiking amounts
  - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - (d) Calculated %Rs and relative percent differences (RPDs)
  - (e) The laboratory's MS/MSD QC limits
- [x] R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - (a) The amount of analyte measured in the duplicate
  - (b) The calculated RPD
  - (c) The laboratory's QC limits for analytical duplicates
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: (●) This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger		Chemist	11/29/23
Name (printed)	Signature	Official Title	Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310189

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310189

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey CCR

Reviewer Name: Michael Ohlinger

LRC Date: 11/29/23

Laboratory Job Number: 233267

Prep Batch Number(s): QC2310189

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*MQL.

[1] Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

[2] O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

[3] NA - Not applicable; NR - Not reviewed.

[4] Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

APPENDIX 6- Well Installation/Decommissioning Logs

Reports documenting monitoring well plugging and abandonment or well installation are included in the appendix.

STATE OF TEXAS PLUGGING REPORT for Tracking #232687

Owner:	**SWEPCO**	Owner Well #:	**MW-7 (AD-7)**
Address:	**2400 FM 3251 Hallsville, TX 75650**	Grid #:	**35-37-1**
Well Location:	**2400 FM 3251 Hallsville, TX 75650**	Latitude:	**32° 27' 40.81" N**
		Longitude:	**094° 29' 12.31" W**
Well County:	**Harrison**	Elevation:	**No Data**

Well Type: **Monitor**

Drilling Information

Company: **No Data** Date Drilled: **10/3/1983**

Driller: **No Data** License Number: **No Data**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**10**	**0**	**40**

Plugging Information

Date Plugged: **9/12/2023** Plugger: **Rich Herman**

Plug Method: **Pour in 3/8 bentonite chips when standing water in well is less than 100 feet depth, cement top 2 feet**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
4	**0**	**40**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
0	**40**	**Bentonite 9 Bags/Sacks**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **ETTL Engineers & Consultants, Inc.**

1717 East Erwin Street
Tyler, TX 75702

Driller Name: **Rich Herman** License Number: **59385**

Comments: **All casing and screen left in the hole. When attempting to pull, 3' of stickup was all that came out. No cement cap per client request due to grading that is currently going on**