

# **Annual Groundwater Monitoring Report**

Southwestern Electric Power Company

Welsh Power Plant

**Primary Bottom Ash Pond**

**CN 602843245; RN100213370**

**Registration No: CCR 110**

1187 Country Road 4865

Titus County

Pittsburg, Texas

**January 2023**

Prepared by:

American Electric Power Service Corporation

1 Riverside Plaza

Columbus, Ohio 43215



An **AEP** Company

BOUNDLESS ENERGY™

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## **Abbreviations:**

ASD - Alternate Source Demonstration

CCR – Coal Combustion Residual

GWPS - Groundwater protection standards

PBAP – Primary Bottom Ash Pond

SSI - Statistically Significant Increase

SSL – Statistically Significant Level

TCEQ – Texas Commission on Environmental Quality

## I. Overview

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for an existing Coal Combustion Residual (CCR) unit at Southwestern Electric Power Company's, a wholly owned subsidiary of American Electric Power Company (AEP), Welsh Power Plant. 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, 2023.

In general, the following activities were completed:

- At the start of the current annual reporting period, the PBAP was operating under the Assessment monitoring program.
- At the end of the current annual reporting period, the PBAP was operating under the Assessment monitoring program.
- The PBAP initiated an assessment monitoring program on April 13, 2018.
- Groundwater samples and elevations were collected for AD-1, AD-5, AD-17, AD-8, AD-9, and AD-15 and analyzed for Appendix III and IV constituents, as specified in 30 TAC §352.951 *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 2<sup>nd</sup> semi-annual 2021 sampling event (October, 2021):
  - Potential Statistically Significant Increases (SSIs) above background were identified for:
    - Boron at AD-8
    - pH at AD-9 and AD-15
  - No potential Statistically Significant Levels (SSLs) above the groundwater protection standards (GWPS) were identified.
- Annual groundwater sampling was conducted in March 2022;
- The 1<sup>st</sup> semi-annual groundwater sampling event was conducted in June 2022;
  - Potential SSIs above background were identified for:
    - Boron at AD-8
    - pH at AD-15
  - No potential SSLs above GWPS were identified.
- Statistical evaluation of the 2<sup>nd</sup> semi-annual 2022 groundwater sampling event conducted October-November 2022 is underway.

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 PBAP CCR management unit, 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 assessment monitoring programs is included in Appendix 1;
- Statistical comparison of monitoring data to determine if there have been SSI(s) and SSLs, where applicable (Appendix 2);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions, where applicable (Appendix 3);
- A summary of any transition between monitoring programs or an alternate monitoring frequency, if applicable (Appendix 4).
- Identification of any monitoring wells that were installed, or decommissioned during the preceding year, along with a statement as to why that happened, where applicable (Appendix 5,); and
- Other information required to be included in the annual report, field sheets, analytical reports, etc. (Appendix 6)

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.





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

Groundwater samples and elevations were collected for AD-1, AD-5, AD-17, AD-8, AD-9, and AD-15 and analyzed for Appendix III and IV constituents, as specified in §352.951*et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2021)*.

Appendix 1 contains potentiometric maps with the static water elevation, groundwater flow direction for each monitoring event, tables showing groundwater velocity, and all the groundwater quality data collected to date under 30 TAC 352.951.

#### **V. Groundwater Quality Data Statistical Analysis**

Appendix 2 contains the statistical analysis reports available for this reporting period.

Data and statistical analysis not available for the previous reporting period indicated that during the 2<sup>nd</sup> semi-annual 2021 sampling event (October 20, 2021 and certified February 16, 2022):

- Potential SSIs above background were identified for:
  - Boron at AD-8
  - pH at AD-9 and AD-15
- No potential SSLs above GWPS were identified

The annual sampling event for the compliance wells for Appendix III and IV parameters was conducted March 1, 2022 and satisfies the requirement of 30 TAC 352.951.

The 1<sup>st</sup> semi-annual groundwater sampling event was conducted June 27-28, 2022 with statistical evaluation certified November 7, 2022;

- Potential SSIs above background were identified for:
  - Boron at AD-8
  - pH at AD-9
- No potential SSLs above GWPS were identified

Statistical evaluation of the 2<sup>nd</sup> semi-annual 2022 groundwater sampling event conducted October 31 – November 1, 2022, is underway.

#### **VI. Alternate Source Demonstrations**

No ASDs were conducted for this reporting period.

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

As of this annual groundwater report, the CCR Unit remains in assessment monitoring and will be sampled on a semi-annual basis.

**VIII. Other Information Required**

Field sheets and laboratory reports are in Appendix 6.

**IX. Description of Any Problems Encountered and Actions Taken**

No significant problems were encountered.

**X. A Projection of Key Activities for the Upcoming Year**

- Complete the statistical evaluation of the 2<sup>nd</sup> semi-annual 2022 groundwater monitoring event;
- Conducted the annual groundwater sampling event for all constituents listed in 30 TAC 352 Appendix III and IV;
- Assessment monitoring will continue on a semiannual groundwater sampling schedule for 30 TAC 352 Appendix III and IV constituents;
- Evaluation of the assessment monitoring results from a statistical analysis viewpoint, looking for SSIs above background and SSLs above GWPS;
- If needed, ASDs will be conducted to evaluate if the unit can remain in assessment monitoring or the unit will move to an assessment of corrective measures;
- Responding to any new data received considering TCEQ's CCR rule requirements; and
- Preparation of the next annual groundwater report.

## APPENDIX 1

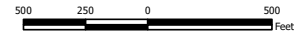
Potentiometric maps and tables follow, showing the groundwater monitoring data collected, the rate and direction of groundwater flow, and a summary showing the number of samples collected per monitoring well. The dates that the samples were collected also is shown.



- Legend**
- ◆ Groundwater Monitoring Well
  - Groundwater Elevation Contour
  - - - Groundwater Elevation Contour (Inferred)
  - ➔ Approximate Groundwater Flow Direction
  - CCR Units

**Notes**

- Monitoring well coordinates and water level data (collected on March 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.



*Beth Ann Gross*  
 July 26, 2022  
 Geosyntec Consultants, Inc.  
 Texas Firm Registration No. 1182

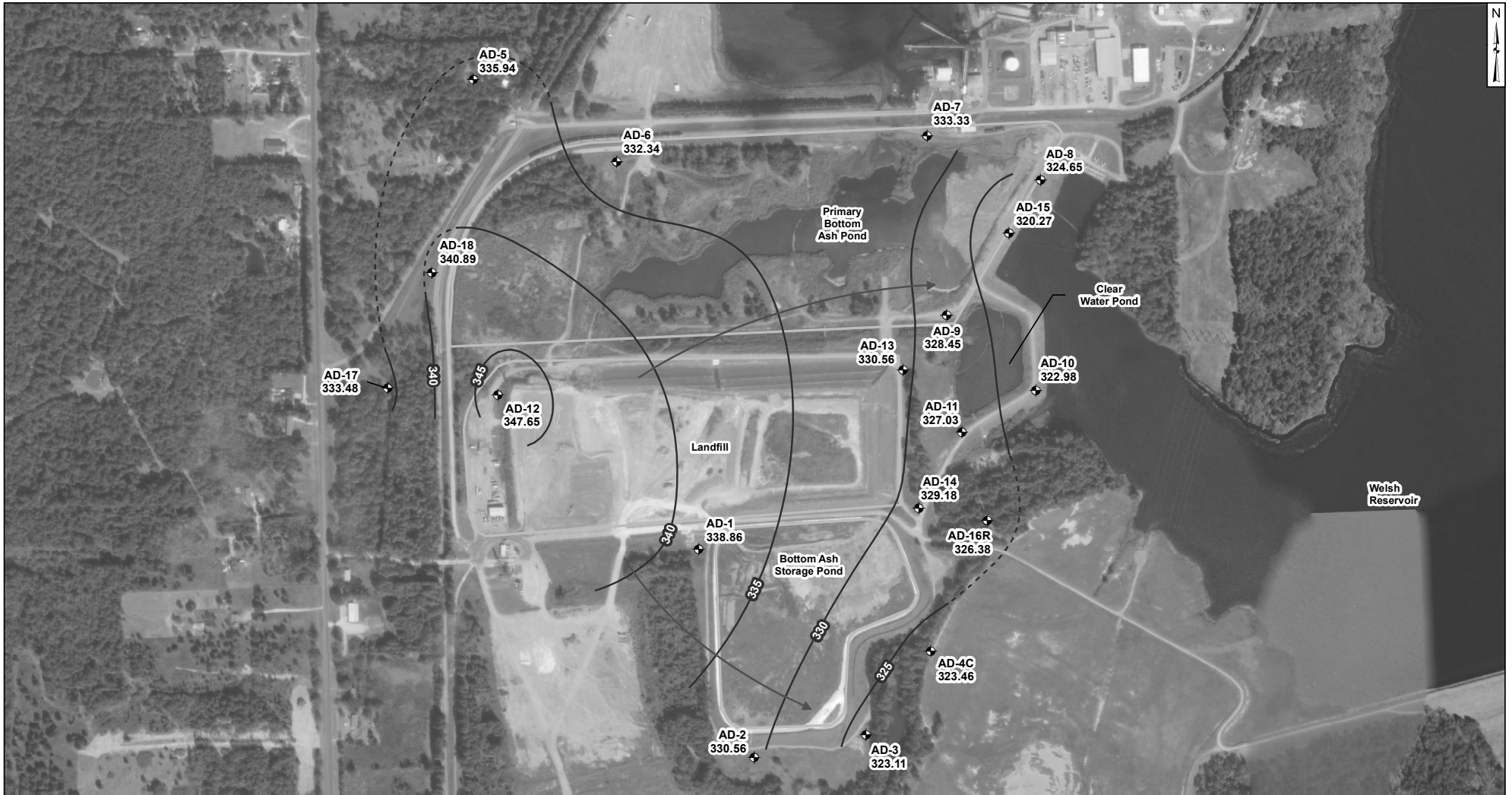
**Groundwater Potentiometric Map  
 March 2022**

AEP Welsh Power Plant  
 Cason, Texas

**Geosyntec**<sup>®</sup>  
 consultants

Columbus, Ohio      2022/07/26

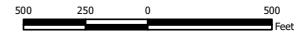
Figure  
**1**



- Legend**
- ◆ Groundwater Monitoring Well
  - Groundwater Elevation Contour
  - - - Groundwater Elevation Contour (Inferred)
  - Approximate Groundwater Flow Direction
  - CCR Units

**Notes**

- Monitoring well coordinates and water level data (collected on June 27 and 28, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.



*Beth Ann Gross*  
 Dec 7, 2022  
 Geosyntec Consultants, Inc.  
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**Groundwater Potentiometric Map  
 June 2022**

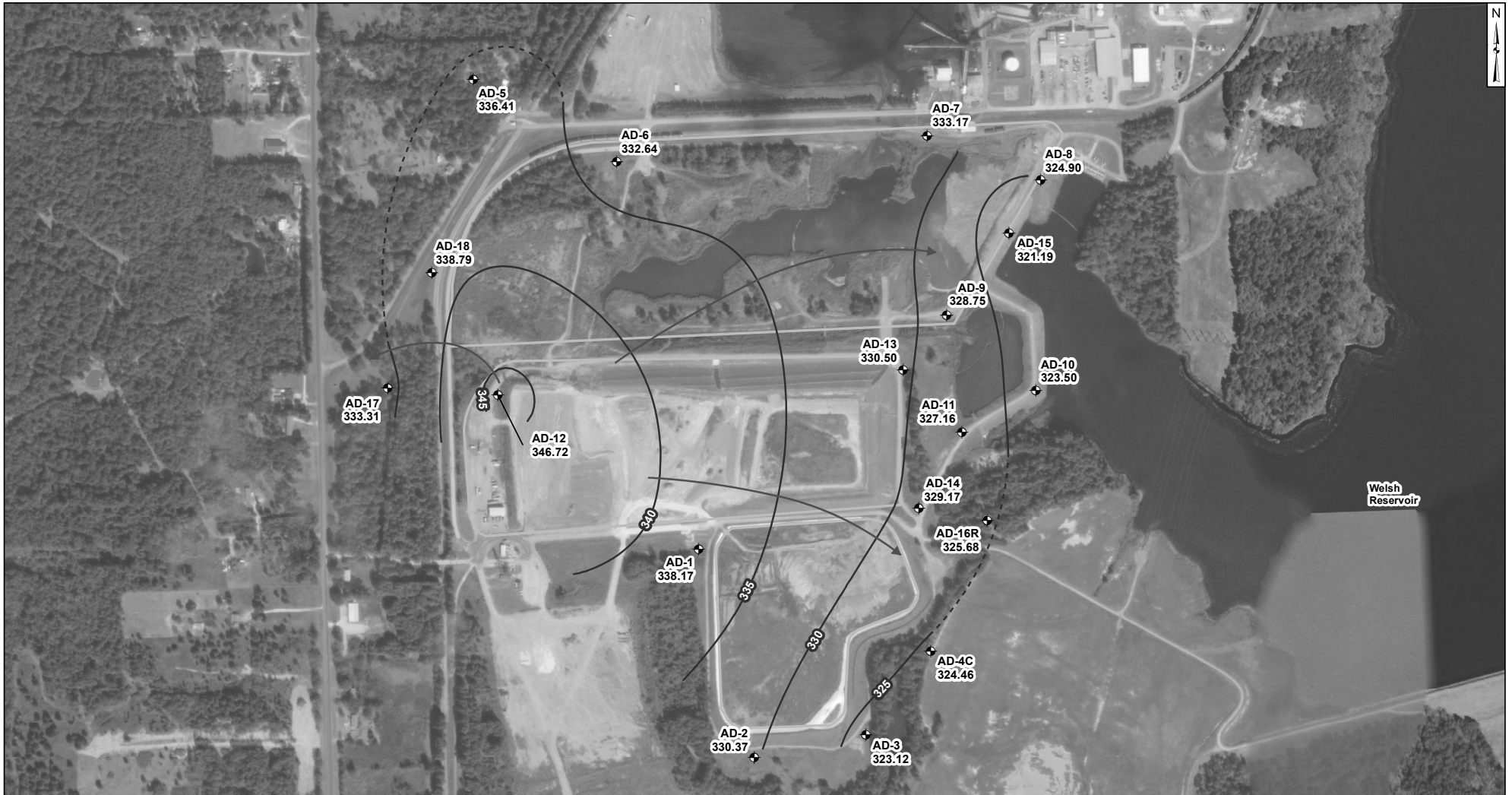
AEP Welsh Power Plant  
 Cason, Texas

**Geosyntec**  
 consultants

Columbus, Ohio      2022/10/31

Figure  
 2

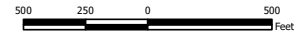




- Legend**
- Groundwater Monitoring Well
  - Groundwater Elevation Contour
  - Groundwater Elevation Contour (Inferred)
  - Approximate Groundwater Flow Direction
  - CCR Units

**Notes**

- Monitoring well coordinates and water level data (collected on November 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.
- Satellite imagery provided by ESRI.



*Beth Ann Gross*

January 5, 2023

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**Groundwater Potentiometric Map  
November 2022**

AEP Welsh Power Plant  
Cason, Texas

**Geosyntec**<sup>®</sup>  
consultants

Columbus, Ohio

2022/11/16

Figure

3

**Table 1: Residence Time Calculation Summary  
Welsh Primary Bottom Ash Pond**

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2022-03		2022-06		2022-11	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Primary Bottom Ash Pond	AD-1 <sup>[1]</sup>	2.0	3.2	19.3	3.2	19.1	2.9	20.9
	AD-5 <sup>[1]</sup>	2.0	1.7	36.5	1.5	39.8	1.7	36.7
	AD-8 <sup>[2]</sup>	2.0	3.4	18.0	3.4	17.9	3.2	18.8
	AD-9 <sup>[2]</sup>	2.0	5.4	11.2	5.0	12.2	3.3	18.7
	AD-15 <sup>[2]</sup>	2.0	7.1	8.5	7.0	8.7	6.8	8.9
	AD-17 <sup>[1]</sup>	2.0	7.7	7.9	10.0	6.1	7.1	8.6

Notes:

[1] - Upgradient Well

[2] - Downgradient Well



**Table 1 - Groundwater Data Summary: AD-1  
Welsh - PBAP  
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
5/26/2016	Background	0.346	36.5	5	< 0.083 U1	5.9	42	252
7/27/2016	Background	0.35	39.6	4	< 0.083 U1	5.3	36	239
9/30/2016	Background	0.332	15	5	< 0.083 U1	5.4	35	173
10/19/2016	Background	0.398	19.1	4	< 0.083 U1	5.2	42	192
12/12/2016	Background	0.394	8.74	4	< 0.083 U1	5.2	40	200
1/17/2017	Background	0.656	129	4	< 0.083 U1	7.1	68	538
2/23/2017	Background	0.7	147	9	< 0.083 U1	6.9	68	612
6/7/2017	Background	0.449	15.1	4	< 0.083 U1	5.1	42	176
10/6/2017	Detection	0.453	14.3	4	< 0.083 U1	5.3	40	160
5/24/2018	Assessment	0.345	10.2	4	< 0.083 U1	5.2	43	150
8/14/2018	Assessment	0.443	5.95	5	< 0.083 U1	5.2	44	160
2/20/2019	Assessment	0.504	142	2.82	0.24	7.3	49.2	522
5/30/2019	Assessment	0.689	138	1.59	0.29	6.7	43.3	588
7/24/2019	Assessment	0.644	62.7	2	0.106 J1	6.0	58	180
2/17/2020	Assessment	0.626	115	3.41	0.31	5.8	56.3	488
5/20/2020	Assessment	0.801	126	1.83	0.20	7.2	51.4	508
10/14/2020	Assessment	0.670	3.88	2.16	0.25	4.5	66.9	183
2/23/2021	Assessment	0.617	113	--	0.31	6.6	--	--
6/2/2021	Assessment	0.786	97.1	2.26	0.30	6.2	61.4	400
10/20/2021	Assessment	0.732	4.8	2.21	0.22	4.4	72.4	190
6/28/2022	Assessment	0.768	6.76	2.32	0.22	4.9	74.7	180
11/1/2022	Assessment	0.586	7.87	2.70	0.14	4.8	61.3	170

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**Table 1 - Groundwater Data Summary: AD-1  
Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/26/2016	Background	< 0.93 U1	1.39361 J1	191	0.271453 J1	0.213294 J1	0.240267 J1	1.15339 J1	1.184	< 0.083 U1	< 0.68 U1	0.01	0.033	0.53149 J1	1.74922 J1	0.959865 J1
7/27/2016	Background	< 0.93 U1	< 1.05 U1	191	0.315631 J1	0.0940357 J1	< 0.23 U1	0.615933 J1	0.9952	< 0.083 U1	< 0.68 U1	0.019	0.00793 J1	< 0.29 U1	1.81763 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	2.96797 J1	141	0.382874 J1	< 0.07 U1	5	0.850408 J1	1.38	< 0.083 U1	3.38434 J1	0.014	0.01773 J1	< 0.29 U1	1.02629 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	114	0.311247 J1	< 0.07 U1	0.412131 J1	0.649606 J1	1.141	< 0.083 U1	< 0.68 U1	0.008	0.00534 J1	1.39872 J1	2.03168 J1	1.25062 J1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	72	0.34133 J1	< 0.07 U1	< 0.23 U1	0.424105 J1	0.719	< 0.083 U1	< 0.68 U1	0.008	0.01521 J1	< 0.29 U1	1.85825 J1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	410	0.0366913 J1	< 0.07 U1	< 0.23 U1	0.480125 J1	3.009	< 0.083 U1	< 0.68 U1	0.000275956 J1	< 0.005 U1	< 0.29 U1	4.04737 J1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	488	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.765099 J1	4.309	< 0.083 U1	< 0.68 U1	0.001	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	1.14 J1	93.46	0.37 J1	< 0.07 U1	0.66 J1	0.77 J1	0.676	< 0.083 U1	< 0.68 U1	0.00902	0.007 J1	< 0.29 U1	2.1 J1	< 0.86 U1
5/24/2018	Assessment	3.17 J1	< 1.05 U1	79.9	0.39 J1	< 0.07 U1	< 0.23 U1	0.35 J1	1.983	< 0.083 U1	< 0.68 U1	0.00814	0.006 J1	< 0.29 U1	1.38 J1	< 0.86 U1
8/14/2018	Assessment	0.03 J1	0.21	63.0	0.482	0.02	0.160	0.797	1.102	< 0.083 U1	0.238	0.00708	0.013 J1	0.21	1.7	0.03 J1
2/20/2019	Assessment	0.16	0.46	457	0.09 J1	0.01 J1	0.306	0.399	3.159	0.24	0.124	0.00155	< 0.005 U1	1 J1	0.7	< 0.1 U1
5/30/2019	Assessment	0.16	0.60	512	0.244	0.01 J1	0.1 J1	0.756	2.717	0.29	0.197	< 0.009 U1	< 0.005 U1	2.43	1.4	< 0.1 U1
7/24/2019	Assessment	0.08 J1	0.39	245	0.540	0.02 J1	0.1 J1	0.789	1.819	0.106 J1	0.1 J1	0.00557	< 0.005 U1	2 J1	3.4	< 0.1 U1
2/17/2020	Assessment	0.33	0.49	303	0.07 J1	0.02 J1	0.1 J1	0.28	2.665	0.31	0.1 J1	0.00105	< 0.002 U1	1 J1	2.3	< 0.1 U1
5/20/2020	Assessment	0.15	0.53	394	0.270	0.02 J1	0.1 J1	0.490	2.312	0.20	0.1 J1	0.00301	< 0.002 U1	2 J1	2.8	< 0.1 U1
10/14/2020	Assessment	< 0.1 U1	0.3 J1	84.7	0.984	< 0.05 U1	0.9 J1	2.12	1.552	0.25	0.3 J1	0.00932	0.003 J1	< 2 U1	5.3	< 0.5 U1
2/23/2021	Assessment	0.24	0.74	338	0.136	0.03 J1	0.338	0.477	1.737	0.31	0.852	0.00155	< 0.002 U1	1 J1	2.5	< 0.1 U1
6/2/2021	Assessment	0.18	0.66	349	0.088	0.01 J1	0.32	0.474	2.15	0.30	0.09 J1	0.00052	0.002 J1	4.8	1.26	< 0.04 U1
10/20/2021	Assessment	0.04 J1	0.20	86.1	0.932	0.026	0.33	2.44	0.99	0.22	0.23	0.00756	0.003 J1	< 0.1 U1	7.39	< 0.04 U1
6/28/2022	Assessment	0.03 J1	0.26	85.4	0.995	0.030	0.37	2.34	3.69	0.22	0.33	0.00855	0.002 J1	< 0.1 U1	8.35	0.05 J1
11/1/2022	Assessment	0.03 J1	0.19	78.9	0.620	0.024	0.35	1.17	2.01	0.14	0.13 J1	0.00818	0.002 J1	< 0.1 U1	5.51	< 0.04 U1

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

**Table 1 - Groundwater Data Summary: AD-5  
Welsh - PBAP  
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
5/31/2016	Background	0.03	36.9	15	0.3469 J1	6.4	123	337
7/28/2016	Background	0.04	44.7	16	< 0.083 U1	5.4	163	360
9/30/2016	Background	0.04	46.3	15	0.2436 J1	5.3	190	416
10/20/2016	Background	0.05	50.7	14	< 0.083 U1	5.9	267	448
12/13/2016	Background	0.05	49.6	13	< 0.083 U1	6.2	233	484
1/17/2017	Background	0.04	49.8	14	< 0.083 U1	6.3	234	438
2/23/2017	Background	0.04	33	15	< 0.083 U1	5.5	127	286
6/7/2017	Background	0.05281	49.7	14	< 0.083 U1	6.0	82	300
10/6/2017	Detection	0.04322	33.1	16	< 0.083 U1	5.6	82	258
5/24/2018	Assessment	0.05007	28.1	22	< 0.083 U1	6.2	60	242
8/15/2018	Assessment	0.050	40.5	19	< 0.083 U1	6.2	240	428
2/21/2019	Assessment	0.033	33.9	24.7	0.21	5.4	46.5	220
5/30/2019	Assessment	0.03 J1	30.0	22.3	0.29	6.3	51.3	238
7/24/2019	Assessment	0.04 J1	41.1	18	0.112 J1	6.3	90	354
2/17/2020	Assessment	0.03 J1	39.8	19.8	0.22	5.5	43.7	248
5/20/2020	Assessment	0.03 J1	40.2	22.3	0.18	6.8	55.5	264
10/14/2020	Assessment	0.04 J1	36.6	18.8	0.18	6.5	148	338
2/23/2021	Assessment	0.03 J1	30.9	--	0.23	6.0	--	--
6/2/2021	Assessment	0.027 J1	24.4	19.6	0.21	5.8	53.8	220
10/20/2021	Assessment	0.038 J1	38.4	17.4	0.17	5.6	155	370
6/28/2022	Assessment	0.048 J1	32.9	15.3	0.15	5.9	146	310
11/1/2022	Assessment	0.041 J1	38.6	16.9	0.16	5.9	185	380

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**Table 1 - Groundwater Data Summary: AD-5  
Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/31/2016	Background	< 0.93 U1	< 1.05 U1	57	0.149801 J1	0.0765156 J1	0.555038 J1	14	1.634	0.3469 J1	< 0.68 U1	0.135	0.01135 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/28/2016	Background	2.05116 J1	2.90819 J1	93	0.518653 J1	0.502155 J1	0.411466 J1	15	4.75	< 0.083 U1	< 0.68 U1	0.191	0.01516 J1	< 0.29 U1	1.08901 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	4.7609 J1	87	0.251584 J1	< 0.07 U1	0.90676 J1	14	3.33	0.2436 J1	< 0.68 U1	0.186	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/20/2016	Background	< 0.93 U1	< 1.05 U1	70	0.08781 J1	0.107488 J1	0.248085 J1	9	2.319	< 0.083 U1	< 0.68 U1	0.225	< 0.005 U1	1.36984 J1	< 0.99 U1	< 0.86 U1
12/13/2016	Background	< 0.93 U1	1.15381 J1	53	0.164529 J1	0.203546 J1	0.747921 J1	13	2.182	< 0.083 U1	< 0.68 U1	0.199	0.00802 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	47	0.0574718 J1	0.180502 J1	< 0.23 U1	12	1.023	< 0.083 U1	< 0.68 U1	0.239	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	42	0.0306858 J1	< 0.07 U1	< 0.23 U1	13	1.788	< 0.083 U1	< 0.68 U1	0.166	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	3.85 J1	87.7	0.08 J1	0.39 J1	0.28 J1	11.93	2.32	< 0.083 U1	< 0.68 U1	0.124	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/24/2018	Assessment	< 0.93 U1	< 1.05 U1	71.16	< 0.02 U1	0.23 J1	0.8 J1	14.24	1.946	< 0.083 U1	< 0.68 U1	0.121	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/15/2018	Assessment	0.01 J1	1.69	63.7	0.055	0.008 J1	0.072	11.4	0.316	< 0.083 U1	0.079	0.147	< 0.005 U1	0.13	0.08 J1	< 10 U1
2/21/2019	Assessment	0.02 J1	1.59	69.4	0.08 J1	< 0.01 U1	0.432	8.58	1.267	0.21	0.147	0.0807	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
5/30/2019	Assessment	< 0.02 U1	3.05	60.5	0.08 J1	< 0.01 U1	0.06 J1	11.8	1.431	0.29	0.05 J1	0.104	0.006 J1	< 0.4 U1	0.05 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	2.48	77.4	0.05 J1	< 0.01 U1	0.05 J1	8.38	2.533	0.112 J1	< 0.05 U1	0.108	< 0.005 U1	< 0.4 U1	0.06 J1	< 0.1 U1
2/17/2020	Assessment	0.03 J1	2.17	109	0.09 J1	0.02 J1	0.336	4.52	2.393	0.22	0.227	0.0732	< 0.002 U1	0.9 J1	0.2	< 0.1 U1
5/20/2020	Assessment	< 0.02 U1	1.78	93.1	0.05 J1	0.01 J1	0.1 J1	7.65	1.612	0.18	0.07 J1	0.0740	< 0.002 U1	< 0.4 U1	0.09 J1	< 0.1 U1
10/14/2020	Assessment	< 0.02 U1	6.28	71.7	0.09 J1	< 0.01 U1	0.09 J1	14.9	2.7	0.18	0.05 J1	0.134	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
2/23/2021	Assessment	< 0.02 U1	2.06	68.3	0.03 J1	< 0.01 U1	0.1 J1	6.31	1.397	0.23	< 0.05 U1	0.0705	< 0.002 U1	< 0.4 U1	0.03 J1	< 0.1 U1
6/2/2021	Assessment	< 0.02 U1	1.72	49.3	0.018 M1, J1	< 0.004 U1	0.26	10.5	2.47	0.21	< 0.05 U1	0.0764 M1	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
10/20/2021	Assessment	< 0.02 U1	1.44	53.2	0.018 J1	< 0.004 U1	0.23	6.85	2.68	0.17	< 0.05 U1	0.133 M1	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/28/2022	Assessment	< 0.02 U1	3.01	51.8	0.032 J1	< 0.004 U1	0.22	12.8	2.06	0.15	< 0.05 U1	0.161	< 0.002 U1	0.1 J1	< 0.09 U1	0.05 J1
11/1/2022	Assessment	< 0.02 U1	2.77	63.2	0.046 J1	< 0.004 U1	0.43	15.1	3.88	0.16	< 0.05 U1	0.174	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

**Table 1 - Groundwater Data Summary: AD-8  
Welsh - PBAP  
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
5/31/2016	Background	1.46	32.6	36	0.6507 J1	6.9	217	524
7/28/2016	Background	1.44	25.9	26	0.485 J1	5.4	202	469
9/29/2016	Background	1.51	24.3	28	0.4912 J1	7.7	186	432
10/20/2016	Background	1.54	25.9	30	0.6234 J1	6.1	184	424
12/12/2016	Background	1.53	23.6	27	0.5355 J1	5.6	168	442
1/19/2017	Background	1.53	18.7	24	0.5574 J1	6.2	153	352
2/22/2017	Background	1.67	19.3	22	< 0.083 U1	6.8	163	356
6/6/2017	Background	1.39	17.4	22	0.6628 J1	5.6	151	368
10/5/2017	Detection	1.49	14.9	20	< 0.083 U1	6.7	128	284
1/4/2018	Detection	1.47	--	--	--	--	--	--
5/23/2018	Assessment	--	--	--	0.501 J1	6.2	--	--
8/15/2018	Assessment	--	--	--	--	6.8	--	--
9/17/2018	Assessment	1.30	15.0	24	--	--	122	288
2/5/2019	Assessment	2.55	19.7	22.8	0.72	5.4	153	--
2/21/2019	Assessment	1.47	17.6	23.2	0.66	6.4	163	352
4/30/2019	Assessment	1.21	--	--	--	6.9	--	--
5/29/2019	Assessment	1.07	16.9	19.5	0.89	5.5	150	324
7/23/2019	Assessment	1.21	20.8	15	0.559 J1	6.6	145	392
2/17/2020	Assessment	1.25	14.6	17.0	0.67	6.5	159	344
5/19/2020	Assessment	1.23	15.1	16.5	0.66	6.4	149	336
7/22/2020	Assessment	1.14	--	--	--	6.6	--	--
10/12/2020	Assessment	1.10	17.2	13.6	0.88	6.8	138	298
2/23/2021	Assessment	1.18	14.8	--	0.69	6.1	--	--
6/1/2021	Assessment	1.10	15.3	14.8	0.73	5.3	162	330
10/19/2021	Assessment	1.10	17.2	13.7	0.90	5.5	139	300
3/1/2022	Assessment	1.16	18.7	15.9	0.97	5.9	138	260
6/27/2022	Assessment	1.15	19.5	15.9	0.82	5.9	156	330
10/31/2022	Assessment	1.08	22.3	20.9	0.93	6.1	141	280

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

Table 1 - Groundwater Data Summary: AD-8

Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/31/2016	Background	< 0.93 U1	1.06251 J1	34	0.114491 J1	< 0.07 U1	2	7	1.046	0.6507 J1	< 0.68 U1	0.122	0.02103 J1	1.01326 J1	1.37017 J1	1.18455 J1
7/28/2016	Background	1.46141 J1	< 1.05 U1	26	0.171642 J1	< 0.07 U1	0.751164 J1	9	1.584	0.485 J1	< 0.68 U1	0.098	0.00859 J1	1.48301 J1	1.96333 J1	< 0.86 U1
9/29/2016	Background	< 0.93 U1	< 1.05 U1	23	< 0.02 U1	< 0.07 U1	0.51348 J1	7	6.3	0.4912 J1	< 0.68 U1	0.111	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/20/2016	Background	< 0.93 U1	< 1.05 U1	24	0.028758 J1	< 0.07 U1	0.617826 J1	7	0.3449	0.6234 J1	< 0.68 U1	0.135	< 0.005 U1	0.838863 J1	< 0.99 U1	1.64377 J1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	21	< 0.02 U1	< 0.07 U1	< 0.23 U1	7	1.083	0.5355 J1	< 0.68 U1	0.11	0.01007 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	< 1.05 U1	20	< 0.02 U1	< 0.07 U1	< 0.23 U1	6	0.823	0.5574 J1	< 0.68 U1	0.094	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	19	< 0.02 U1	< 0.07 U1	< 0.23 U1	6	0.536	< 0.083 U1	< 0.68 U1	0.092	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	< 1.05 U1	19.08	< 0.02 U1	< 0.07 U1	< 0.23 U1	3.86 J1	1.0735	0.6628 J1	< 0.68 U1	0.09491	0.008 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/23/2018	Assessment	3.19 J1	< 1.05 U1	22.12	< 0.02 U1	< 0.07 U1	< 0.23 U1	3.19 J1	0.3366	0.501 J1	< 0.68 U1	0.0956	< 0.005 U1	< 0.29 U1	1.75 J1	< 0.86 U1
8/15/2018	Assessment	0.01 J1	0.31	21.2	0.008 J1	0.02 J1	0.050	5.36	3.44	--	0.039	0.0555	--	0.16	0.07 J1	0.129
2/21/2019	Assessment	< 0.02 U1	0.57	28.1	0.03 J1	0.03 J1	0.456	2.88	0.417	0.66	0.223	0.0911	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
5/29/2019	Assessment	< 0.02 U1	0.37	30.3	< 0.02 U1	0.02 J1	0.1 J1	6.03	0.911	0.89	0.07 J1	0.067	< 0.005 U1	< 0.4 U1	0.06 J1	0.1 J1
7/23/2019	Assessment	< 0.02 U1	0.41	31.0	< 0.02 U1	0.02 J1	0.09 J1	7.07	0.72	0.559 J1	0.08 J1	0.0641	< 0.005 U1	< 0.4 U1	0.08 J1	0.1 J1
2/17/2020	Assessment	< 0.02 U1	0.55	38.9	< 0.02 U1	0.05 J1	0.244	1.02	1.257	0.67	0.1 J1	0.124	< 0.002 U1	< 0.4 U1	0.08 J1	< 0.1 U1
5/19/2020	Assessment	< 0.02 U1	0.27	21.1	< 0.02 U1	0.04 J1	0.2 J1	1.17	0.344	0.66	< 0.05 U1	0.0872	< 0.002 U1	< 0.4 U1	0.07 J1	< 0.1 U1
10/12/2020	Assessment	< 0.02 U1	0.30	25.9	< 0.02 U1	0.04 J1	0.06 J1	5.71	0.267	0.88	0.06 J1	0.0615	< 0.002 U1	< 0.4 U1	0.08 J1	0.1 J1
2/23/2021	Assessment	< 0.02 U1	0.31	24.2	< 0.1 U1	0.03 J1	0.1 J1	0.899	0.544	0.69	0.06 J1	0.104	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/1/2021	Assessment	< 0.02 U1	0.37	47.9	0.01 J1	0.029	0.28	1.04	0.69	0.73	0.07 J1	0.0818	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.05 J1
10/19/2021	Assessment	< 0.02 U1	0.25	23.3	< 0.01 U1	0.021	0.27	4.13	1.15	0.90	< 0.05 U1	0.0690	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.11 J1
3/1/2022	Assessment	< 0.02 U1	0.27	23.6	< 0.04 U1	0.018 J1	0.23	5.10	1.31	0.97	< 0.05 U1	0.0654	< 0.002 Q1, U1	< 0.1 U1	< 0.09 U1	0.13 J1
6/27/2022	Assessment	< 0.02 U1	0.25	26.1	< 0.007 U1	0.018 J1	0.41	3.15	1.39	0.82	0.07 J1	0.0777	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.11 J1
10/31/2022	Assessment	< 0.02 U1	0.25	27.8	0.01 J1	0.038	0.31	8.92	1.1	0.93	< 0.05 U1	0.0559	< 0.002 U1	0.2 J1	< 0.09 U1	0.15 J1

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

Q1: Sample was received in inappropriate sample container.

**Table 1 - Groundwater Data Summary: AD-9**

**Welsh - PBAP**

**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
5/31/2016	Background	0.12	229	88	0.4191 J1	6.3	1,352	2,541
7/28/2016	Background	0.105	255	98	0.4339 J1	5.0	1,464	2,564
9/29/2016	Background	0.115	220	86	0.304 J1	4.7	1,301	2,448
10/19/2016	Background	0.109	228	76	0.6227 J1	5.2	1,350	2,494
12/12/2016	Background	0.108	250	92	< 0.083 U1	5.7	1,639	2,667
1/19/2017	Background	0.312	91.1	54	< 0.083 U1	5.4	884	1,360
2/22/2017	Background	0.1	258	86	< 0.083 U1	5.8	1,774	2,662
6/6/2017	Background	0.146	191	19	< 0.083 U1	4.6	105	308
10/5/2017	Detection	0.129	9.64	20	< 0.083 U1	5.8	86	248
5/23/2018	Assessment	--	--	--	< 0.083 U1	5.3	--	--
8/15/2018	Assessment	--	--	--	--	5.0	--	--
9/17/2018	Assessment	0.198	230	103	--	--	1,910	2,694
2/5/2019	Assessment	0.096	133	27.9	0.16	4.2	181	--
2/21/2019	Assessment	1.39	211	89	0.19	5.0	1,350	2,240
4/30/2019	Assessment	0.07	--	--	--	4.5	--	--
5/29/2019	Assessment	0.06 J1	10.1	44.0	0.16	3.6	503	1,758
7/23/2019	Assessment	0.081	222	77	0.5736 J1	6.3	1,701	2,460
2/17/2020	Assessment	0.12	11.5	19.9	0.15	6.0	100	282
5/19/2020	Assessment	0.066	11.3	44.8	0.1 J1	4.9	536	902
10/12/2020	Assessment	0.100	11.8	18.8	0.19	4.8	100	296
2/23/2021	Assessment	0.219	11.6	--	0.21	4.7	--	--
6/1/2021	Assessment	0.221	12.5	16.7	0.19	4.4	118	300
10/19/2021	Assessment	0.226	11.9	31.8	0.19	4.3	374	700
3/1/2022	Assessment	0.148	12.0	18.3	0.15	4.8	109	300
6/27/2022	Assessment	0.174	109	59.8	0.09 J1	4.8	933	1,460
10/31/2022	Assessment	0.109	12.4	16.8	0.17	5.0	122	300

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**Table 1 - Groundwater Data Summary: AD-9  
Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/31/2016	Background	< 0.93 U1	< 1.05 U1	51	0.999439 J1	1	< 0.23 U1	27	2.945	0.4191 J1	< 0.68 U1	1.32	0.0194 J1	< 0.29 U1	1.04175 J1	< 0.86 U1
7/28/2016	Background	< 0.93 U1	< 1.05 U1	31	0.726564 J1	2	0.262163 J1	22	1.447	0.4339 J1	< 0.68 U1	1.38	0.045	< 0.29 U1	8	< 0.86 U1
9/29/2016	Background	< 0.93 U1	< 1.05 U1	33	0.582852 J1	0.187457 J1	< 0.23 U1	12	3.199	0.304 J1	< 0.68 U1	1.17	0.00739 J1	< 0.29 U1	3.52832 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	26	0.478576 J1	0.965032 J1	< 0.23 U1	16	1.311	0.6227 J1	< 0.68 U1	1.44	< 0.005 U1	< 0.29 U1	3.09028 J1	< 0.86 U1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	27	0.481339 J1	2	< 0.23 U1	24	3	< 0.083 U1	< 0.68 U1	1.33	0.02123 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	< 1.05 U1	98	2	0.693618 J1	< 0.23 U1	42	2.349	< 0.083 U1	< 0.68 U1	0.634	0.00717 J1	< 0.29 U1	< 0.99 U1	1.7755 J1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	22	0.301057 J1	0.680144 J1	< 0.23 U1	24	2.32	< 0.083 U1	< 0.68 U1	1.41	< 0.005 U1	< 0.29 U1	1.06022 J1	1.45295 J1
6/6/2017	Background	< 0.93 U1	< 1.05 U1	42.27	0.77 J1	2.22	< 0.23 U1	24.16	1.586	< 0.083 U1	< 0.68 U1	1	0.006 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/23/2018	Assessment	< 0.93 U1	< 1.05 U1	30.45	0.32 J1	2.88	< 0.23 U1	26.7	2.556	< 0.083 U1	< 0.68 U1	1.2	< 0.005 U1	< 0.29 U1	< 0.99 U1	8.46
8/15/2018	Assessment	< 10 U1	1.68	24.2	0.268	0.06	0.420	11.1	1.864	--	0.262	0.851	--	0.11	0.3	0.062
2/21/2019	Assessment	< 0.02 U1	1.18	52.4	0.474	0.09	0.313	14.8	2.51	0.19	0.08 J1	1.12	0.01 J1	< 0.4 U1	0.3	0.1 J1
5/29/2019	Assessment	< 0.02 U1	0.20	49.7	0.941	0.21	0.346	15.9	1.36	0.16	0.07 J1	0.225	< 0.005 U1	< 0.4 U1	0.2	0.2 J1
7/23/2019	Assessment	< 0.02 U1	1.39	32.1	0.361	0.06	0.2 J1	12.7	1.689	0.5736 J1	0.2 J1	1.11	< 0.005 U1	< 0.4 U1	0.4	< 0.1 U1
2/17/2020	Assessment	< 0.02 U1	0.33	52.8	0.979	0.24	0.608	17.7	1.938	0.15	0.2 J1	0.218	0.002 J1	< 0.4 U1	0.3	0.2 J1
5/19/2020	Assessment	< 0.02 U1	0.25	51.6	0.933	0.24	0.458	16.5	1.854	0.1 J1	0.07 J1	0.160	0.003 J1	< 0.4 U1	0.4	0.2 J1
10/12/2020	Assessment	< 0.02 U1	0.72	55.3	1.27	0.22	0.471	18.6	2.838	0.19	0.349	0.194	0.003 J1	< 0.4 U1	0.3	0.2 J1
2/23/2021	Assessment	< 0.02 U1	0.27	54.9	1.51	0.33	0.373	21.7	1.557	0.21	0.1 J1	0.189	0.003 J1	< 0.4 U1	0.4	0.2 J1
6/1/2021	Assessment	< 0.02 U1	0.21	51.6	1.15	0.353	0.59	20.6	1.74	0.19	0.08 J1	0.141	0.003 J1	< 0.1 U1	0.31 J1	0.22
10/19/2021	Assessment	< 0.02 U1	0.30	50.3	1.36	0.315	0.68	20.6	1.74	0.19	0.1 J1	0.184 P3	0.003 J1	< 0.1 U1	0.34 J1	0.23
3/1/2022	Assessment	< 0.02 U1	0.24	55.3	1.20	0.266	0.74	19.1	3.35	0.15	0.08 J1	0.205	0.003 Q1, J1	< 0.1 U1	0.26 J1	0.22
6/27/2022	Assessment	< 0.02 U1	0.87	49.7	0.780	0.244	0.59	19.5	3.52	0.09 J1	0.27	0.539	< 0.002 U1	< 0.1 U1	0.46 J1	0.22
10/31/2022	Assessment	< 0.02 U1	0.21	52.0	1.14	0.199	1.23	17.1	1.06	0.17	0.08 J1	0.231	0.004 J1	< 0.1 U1	0.27 J1	0.22

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

Q1: Sample was received in inappropriate sample container.



**Table 1 - Groundwater Data Summary: AD-15**

**Welsh - PBAP**

**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
5/31/2016	Background	0.329	5.09	30	< 0.083 U1	5.6	24	188
7/28/2016	Background	0.407	3.83	34	< 0.083 U1	4.8	28	196
9/29/2016	Background	0.36	13.7	28	0.2621 J1	4.6	23	367
10/19/2016	Background	0.152	4.57	26	< 0.083 U1	4.4	17	152
12/12/2016	Background	0.334	3.6	26	< 0.083 U1	4.7	19	204
1/19/2017	Background	0.413	3.35	32	< 0.083 U1	5.8	25	176
2/22/2017	Background	0.1	4.21	20	< 0.083 U1	4.6	8	88
6/6/2017	Background	0.321	3.57	27	< 0.083 U1	4.8	19	184
10/5/2017	Detection	0.395	3.08	30	< 0.083 U1	5.9	21	200
5/23/2018	Assessment	--	--	--	< 0.083 U1	4.8	--	--
8/15/2018	Assessment	--	--	--	--	4.6	--	--
9/17/2018	Assessment	0.341	3.04	37	--	--	24	174
2/5/2019	Assessment	0.03 J1	2.18	20.6	0.06	3.9	0.2 J1	--
2/21/2019	Assessment	0.169	2.67	28.2	0.09	5.0	10.6	150
5/29/2019	Assessment	< 0.02 U1	2.97	21.4	0.06 J1	4.9	2.1	34
7/23/2019	Assessment	0.306	3.45	28	0.086 J1	3.2	18	214
2/17/2020	Assessment	0.419	3.64	34.3	0.11	4.5	21.5	234
5/19/2020	Assessment	0.376	3.37	34.1	0.07	5.3	19.0	216
10/12/2020	Assessment	0.334	2.99	30.4	0.10	5.1	17.1	170
2/23/2021	Assessment	0.03 J1	2.30	--	0.08	4.4	--	--
6/1/2021	Assessment	0.213	3.0	28.4	0.10	4.4	11.4	150
10/19/2021	Assessment	0.218	2.7	28.0	0.09	4.4	10.3	140
3/1/2022	Assessment	0.076	2.63	25.0	0.05 J1	4.4	4.29	80
6/27/2022	Assessment	0.329	3.25	30.9	0.09	4.5	18.9	170
10/31/2022	Assessment	0.093	2.57	26.2	0.07	4.4	4.62	90

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

Table 1 - Groundwater Data Summary: AD-15

Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/31/2016	Background	< 0.93 U1	12	215	0.959793 J1	0.351465 J1	17	11	2.284	< 0.083 U1	7	0.017	0.054	1.77432 J1	3.46337 J1	< 0.86 U1
7/28/2016	Background	< 0.93 U1	6	124	0.362598 J1	0.111427 J1	4	6	1.322	< 0.083 U1	< 0.68 U1	0.021	0.01646 J1	0.586779 J1	1.19442 J1	< 0.86 U1
9/29/2016	Background	< 0.93 U1	131	1,930	15	7	280	134	9.92	0.2621 J1	161	0.149	0.707	3.60313 J1	14	< 0.86 U1
10/19/2016	Background	< 0.93 U1	23	415	2	0.575938 J1	54	19	3.567	< 0.083 U1	22	0.036	0.1	1.54555 J1	1.17613 J1	1.55993 J1
12/12/2016	Background	< 0.93 U1	6	184	0.695316 J1	0.246456 J1	15	10	3.36	< 0.083 U1	3.96087 J1	0.013	0.026	0.463544 J1	1.32943 J1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	6	153	0.449612 J1	< 0.07 U1	9	7	2.386	< 0.083 U1	2.87518 J1	0.008	0.01932 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/22/2017	Background	< 0.93 U1	20	353	2	0.319406 J1	49	20	2.261	< 0.083 U1	19	0.025	0.058	1.42695 J1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	8.54	166	0.61 J1	0.48 J1	12.35	8.44	2.491	< 0.083 U1	2.98 J1	0.0108	0.022 J1	< 0.29 U1	2.71 J1	< 0.86 U1
5/23/2018	Assessment	< 0.93 U1	2.56 J1	102	0.03 J1	0.1 J1	2.63	4.74 J1	1.46	< 0.083 U1	< 0.68 U1	0.00562	< 0.005 U1	< 0.29 U1	1.54 J1	1.37 J1
8/15/2018	Assessment	0.03 J1	3.26	85.2	0.116	0.01 J1	0.481	3.71	1.076	--	0.438	0.00338	--	0.05 J1	0.9	0.090
2/21/2019	Assessment	< 0.02 U1	2.21	76.6	0.208	0.01 J1	0.225	2.9	0.841	0.09	0.104	0.00294	< 0.005 U1	< 0.4 U1	0.4	< 0.1 U1
5/29/2019	Assessment	0.05 J1	2.95	203	1.50	0.08	9.31	5.49	3.55	0.06 J1	9.85	0.01 J1	0.081	< 0.4 U1	5.1	0.1 J1
7/23/2019	Assessment	0.03 J1	2.10	113	0.573	0.04 J1	2.26	5.41	2.245	0.086 J1	2.87	0.00414	0.025	< 0.4 U1	1.6	< 0.1 U1
2/17/2020	Assessment	0.09 J1	9.12	115	0.39	0.02 J1	6.01	4.08	2.546	0.11	4.8	0.00509	0.013	3.32	1.7	0.1 J1
5/19/2020	Assessment	0.02 J1	3.94	80.3	0.09 J1	0.01 J1	0.2 J1	3.28	1.115	0.07	0.09 J1	0.00383	< 0.002 U1	< 0.4 U1	0.7	< 0.1 U1
10/12/2020	Assessment	0.03 J1	4.90	83.4	0.146	0.01 J1	0.425	3.93	1.604	0.10	0.417	0.00393	0.003 J1	< 0.4 U1	0.7	< 0.1 U1
2/23/2021	Assessment	< 0.02 U1	1.39	72.4	0.190	0.02 J1	0.1 J1	2.61	1.021	0.08	0.08 J1	0.00167	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
6/1/2021	Assessment	< 0.02 U1	3.04	76.9	0.138	0.015 J1	0.31	2.73	1.45	0.10	< 0.05 U1	0.00330	< 0.002 U1	< 0.1 U1	0.43 J1	0.05 J1
10/19/2021	Assessment	< 0.02 U1	3.72	73.1	0.143	0.009 J1	0.31	2.84	2.02	0.09	0.07 J1	0.00435	< 0.002 U1	< 0.1 U1	0.55	0.06 J1
3/1/2022	Assessment	< 0.02 U1	1.89	75.1	0.207	0.011 J1	0.55	2.76	2.01	0.05 J1	0.09 J1	0.00208	0.003 Q1, J1	< 0.1 U1	0.29 J1	0.05 J1
6/27/2022	Assessment	< 0.02 U1	3.03	78.5	0.088	0.015 J1	0.38	3.54	2.15	0.09	0.05 J1	0.00573	< 0.002 U1	< 0.1 U1	0.63	0.07 J1
10/31/2022	Assessment	< 0.02 U1	2.55	75.3	0.187	0.015 J1	0.41	2.94	1.67	0.07	0.12 J1	0.00235	< 0.002 U1	< 0.1 U1	0.38 J1	0.05 J1

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

Q1: Sample was received in inappropriate sample container.

**Table 1 - Groundwater Data Summary: AD-17  
Welsh - PBAP  
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
5/26/2016	Background	0.121	200	43	0.4023 J1	7.2	1,166	1,810
7/27/2016	Background	0.119	195	32	0.4135 J1	5.7	1,005	1,576
9/30/2016	Background	0.111	191	36	0.3055 J1	6.2	1,055	1,663
10/20/2016	Background	0.124	194	32	0.583 J1	6.1	1,163	1,612
12/13/2016	Background	0.135	196	31	0.5399 J1	6.0	1,096	1,560
1/17/2017	Background	0.101	196	33	< 0.083 U1	5.9	1,445	1,686
2/22/2017	Background	0.135	189	30	< 0.083 U1	5.7	1,055	1,628
6/6/2017	Background	0.121	188	30	< 0.083 U1	5.8	1,105	1,578
10/6/2017	Detection	0.183	183	31	< 0.083 U1	5.9	1,090	1,548
5/24/2018	Assessment	0.239	193	39	< 0.083 U1	6.3	1,067	1,836
8/15/2018	Assessment	0.118	187	40	< 0.083 U1	5.6	1,168	1,748
2/21/2019	Assessment	0.151	207	43.2	0.18	6.9	1,060	1,722
5/30/2019	Assessment	0.158	202	41.7	< 0.04 U1	6.1	1,120	1,546
7/24/2019	Assessment	0.113	216	37	0.085 J1	6.0	1,127	1,864
2/17/2020	Assessment	0.104	184	36.0	0.16	5.9	1,070	1,750
5/20/2020	Assessment	0.115	250	47.7	0.15	5.7	1,190	1,890
10/14/2020	Assessment	0.100	185	35.7	0.17	5.4	1,060	1,720
2/23/2021	Assessment	0.098	168	--	0.17	5.6	--	--
6/2/2021	Assessment	0.124	233	44.9	0.31	5.7	1,210	1,890
10/20/2021	Assessment	0.104	164	37.3	0.16	5.1	1,040	1,710
6/28/2022	Assessment	0.112	167	37.0	0.09 J1	5.2	1,050	1,740
11/1/2022	Assessment	0.097	165	40.3	0.09 J1	5.7	1,110	1,690

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

Table 1 - Groundwater Data Summary: AD-17

Welsh - PBAP  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/26/2016	Background	< 0.93 U1	1.37501 J1	21	0.173275 J1	2	1	63	1.525	0.4023 J1	< 0.68 U1	0.37	0.032	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/27/2016	Background	1.13716 J1	< 1.05 U1	20	0.307264 J1	4	1	68	2.78	0.4135 J1	< 0.68 U1	0.374	0.02133 J1	1.04115 J1	4.56733 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	< 1.05 U1	31	0.175474 J1	0.848199 J1	3	58	2.358	0.3055 J1	< 0.68 U1	0.354	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/20/2016	Background	< 0.93 U1	< 1.05 U1	34	0.200656 J1	2	4	65	2.224	0.583 J1	< 0.68 U1	0.394	< 0.005 U1	0.322249 J1	3.34422 J1	< 0.86 U1
12/13/2016	Background	< 0.93 U1	< 1.05 U1	17	0.0498325 J1	3	0.816224 J1	68	2.384	0.5399 J1	< 0.68 U1	0.323	0.01485 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	14	0.0319852 J1	3	68	68	2.436	< 0.083 U1	< 0.68 U1	0.341	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	20	0.0665729 J1	2	1	73	2.288	< 0.083 U1	< 0.68 U1	0.331	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	< 1.05 U1	10.33	< 0.02 U1	6.06	< 0.23 U1	74.8	1.598	< 0.083 U1	< 0.68 U1	0.329	0.013 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/24/2018	Assessment	< 0.93 U1	< 1.05 U1	9.65	< 0.02 U1	6.46	< 0.23 U1	71.73	1.939	< 0.083 U1	< 0.68 U1	0.308	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/15/2018	Assessment	0.02 J1	1.83	12.8	0.069	0.25	0.604	43.5	2.35	< 0.083 U1	1.10	0.243	0.011 J1	0.35	0.3	0.074
2/21/2019	Assessment	0.08 J1	2.51	120	0.24	0.27	3.34	64.5	2.657	0.18	2.49	0.268	0.007 J1	0.7 J1	0.8	< 0.1 U1
5/30/2019	Assessment	< 0.02 U1	0.41	19.6	0.02 J1	0.03 J1	0.246	51.1	2.508	< 0.04 U1	0.03 J1	0.341	< 0.005 U1	< 0.4 U1	0.06 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	1.07	14.3	0.130	0.03 J1	0.228	57.7	3.45	0.085 J1	0.263	0.283	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
2/17/2020	Assessment	< 0.02 U1	0.72	9.6	0.04 J1	< 0.01 U1	0.08 J1	42.3	3.46	0.16	< 0.05 U1	0.273	< 0.004 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
5/20/2020	Assessment	< 0.02 U1	0.86	11.4	0.07 J1	0.02 J1	0.231	70.0	2.76	0.15	0.08 J1	0.302	< 0.002 U1	< 0.4 U1	0.09 J1	< 0.1 U1
10/14/2020	Assessment	< 0.02 U1	0.84	10.9	0.04 J1	0.01 J1	0.327	45.4	2.169	0.17	0.2 J1	0.274	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
2/23/2021	Assessment	< 0.02 U1	0.61	10.6	0.03 J1	0.03 J1	0.1 J1	41.1	1.433	0.17	0.08 J1	0.249	< 0.002 U1	< 0.4 U1	0.04 J1	< 0.1 U1
6/2/2021	Assessment	< 0.02 U1	0.84	10.9	0.066	0.026	0.38	72.9	2.4	0.31	0.09 J1	0.311	< 0.002 U1	0.2 J1	< 0.09 U1	< 0.04 U1
10/20/2021	Assessment	< 0.02 U1	0.57	10.2	0.035 J1	0.019 J1	0.38	42.9	1.73	0.16	0.07 J1	0.250	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.05 J1
6/28/2022	Assessment	< 0.02 U1	0.53	12.6	0.040 J1	0.011 J1	0.40	41.3	6.54	0.09 J1	0.12 J1	0.267	0.003 J1	0.1 J1	< 0.09 U1	< 0.04 U1
11/1/2022	Assessment	0.02 J1	0.62	12.7	0.073	0.019 J1	0.96	41.9	3.81	0.09 J1	0.27	0.278	0.004 J1	< 0.1 U1	< 0.09 U1	< 0.04 U1

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

## **APPENDIX 2**

Where applicable, show in this appendix the results from statistical analyses, and a description of the statistical analysis method chosen. These statistical analyses are to be conducted separately for each constituent in each monitoring well.

# STATISTICAL ANALYSIS SUMMARY PRIMARY BOTTOM ASH POND

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## LIST OF ATTACHMENTS

Attachment A	Certification by Qualified Professional Engineer
Attachment B	Statistical Analysis Output

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
PBAP	Primary Bottom Ash Pond
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
UTL	Upper Tolerance Limit



## SECTION 1

### EXECUTIVE SUMMARY

In accordance 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"), groundwater monitoring has been conducted at the Primary Bottom Ash Pond (PBAP), an existing CCR unit at the Welsh Power Plant located in Pittsburg, Texas. Recent groundwater monitoring results were compared to site-specific groundwater protection standards (GWPSs) to identify potential exceedances for CCR units in assessment monitoring.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron at the PBAP. An alternative source was not identified at the time, so the PBAP entered assessment monitoring. GWPSs were set in accordance with § 352.951(b) and a statistical evaluation of the assessment monitoring data was conducted. During 2021, as required by § 352.951(a), an annual sampling event for Appendix IV and select Appendix III parameters was completed in February, and semiannual sampling events for both Appendix III parameters and Appendix IV parameters were completed in June and October. During the June and October 2021 assessment monitoring events, no statistically significant levels (SSLs) were observed; however, concentration of Appendix III parameters remained above background (Geosyntec, 2021). Thus, the unit remained in assessment monitoring. One assessment monitoring event was conducted at the PBAP in October 2021 in accordance with § 352.951(a). The results of the October 2021 assessment event are documented in this report.

Prior to conducting the statistical analyses, the groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether SSLs of Appendix IV parameters were present above the GWPS. No SSLs were identified during this event; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

## SECTION 2

### PRIMARY BOTTOM ASH POND EVALUATION

#### 2.1 Data Validation & QA/QC

During the assessment monitoring program, one set of samples was collected for analysis from each background and compliance well to meet the requirements of § 352.951(a) in October 2021. Samples from October 2021 were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event is presented in Table 1.

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location 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.9.6.32 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

#### 2.2 Statistical Analysis

Statistical analyses for the PBAP were conducted in accordance with the October 2020 *Statistical Analysis Plan* (Geosyntec, 2020), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in October 2021 were screened for potential outliers. No outliers were identified for this event.

##### 2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with § 352.951(b) and the *Statistical Analysis Plan* (Geosyntec, 2020). The established GWPS was determined to be the greater value of the background concentration and the maximum contaminant level (MCL) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for barium, beryllium, chromium, combined radium, and selenium. Non-parametric tolerance limits were calculated for arsenic, cadmium, cobalt, fluoride, and lithium due to apparent non-normal distributions and for antimony,

lead, mercury, molybdenum, and thallium due to a high non-detect frequency. Tolerance limits and the final GWPSs are summarized in Table 2.

### **2.2.2 Evaluation of Potential Appendix IV SSLs**

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

No SSLs were identified at the Welsh PBAP.

### **2.2.3 Establishment of Appendix III Prediction Limits**

Upper prediction limits (UPLs) were previously established for all Appendix III parameters following the background monitoring period (Geosyntec, 2018). Intrawell tests were used to evaluate potential SSIs for calcium, chloride, fluoride, sulfate, and total dissolved solids (TDS), whereas interwell tests were used to evaluate potential SSIs for boron and pH. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data became available.

For the intrawell tests, insufficient data was available to compare against the existing background dataset, thus the prediction limits were not updated for the intrawell tests at this time. The intrawell prediction limits were previously calculated using all historical data through May 2020, except for chloride in compliance well AD-8, which used data from January 2017 to May 2020.

Prediction limits for the interwell tests were calculated using data collected through the 2021 assessment monitoring events. New background well data were tested for outliers prior to being added to the background dataset. Background well data were also evaluated for statistically significant trends using the Sen's Slope/Mann-Kendall trend test, and the results are included in Attachment B. The boron and pH prediction limits were calculated using a one-of-two retesting procedure, as during detection monitoring. The revised interwell prediction limits were used to evaluate a potential SSIs for boron and pH.

After the revised background set was established, a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the practical quantitation limit (PQL) – i.e., “J-flagged” data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Francia test for normality. The Kaplan-Meier non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The

selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in Attachment B.

Interwell UPLs were updated for boron and pH and lower prediction limits (LPLs) were also updated for pH using historical data through October 2021. The updated prediction limits are summarized in Table 3. Intrawell UPLs were previously updated for calcium, chloride, fluoride, sulfate, and TDS using the historical data through May 2020, except for chloride in compliance well AD-8, which used data from January 2017 to May 2020. The prediction limits were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, then it can be concluded that an SSI has not occurred. In practice, where the initial result does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, a second sample will not be collected. The retesting procedures allowed achieving an acceptably high statistical power to detect changes at compliance wells for constituents evaluated using intrawell prediction limits.

#### **2.2.4 Evaluation of Potential Appendix III SSIs**

A review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations.

Data collected during the October 2021 assessment monitoring event from each compliance well were compared to the calculated prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Table 3. The following exceedances of the UPLs were noted:

- Boron concentrations exceeded the interwell UPL of 0.801 mg/L at AD-8 (1.10 mg/L).
- pH values were below the interwell LPL of 4.8 at AD-9 (4.3) and AD-15 (4.4).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the October 2021 sample was above the UPL or below the LPL. Based on these results, concentrations of Appendix III constituents appear to be above background levels at compliance wells.

### **2.3 Conclusions**

A semi-annual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the October 2021 data. GWPSs were re-established for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. No SSLs were identified. Appendix III parameters were compared to established prediction limits, with exceedances of the UPL identified for boron and the LPL for pH.

Based on this evaluation, the Welsh PBAP CCR unit will remain in assessment monitoring.

### **SECTION 3**

#### **REFERENCES**

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Primary Bottom Ash Pond, J. Robert Welsh Plant, Pittsburg, Texas. January 2018.

Geosyntec. 2020. Statistical Analysis Plan. October 2020.

Geosyntec. 2021. Statistical Analysis Summary – Primary Bottom Ash Pond, J. Robert Welsh Plant, Pittsburg, Texas. September 2021.

# TABLES

**Table 1 - Groundwater Data Summary  
Welsh Plant - Primary Bottom Ash Pond**

Well ID		AD-1	AD-5	AD-8	AD-9	AD-15	AD-17
Well Classification		Background	Background	Compliance	Compliance	Compliance	Background
Parameter	Unit	10/20/2021	10/20/2021	10/19/2021	10/19/2021	10/19/2021	10/20/2021
Antimony	µg/L	0.04 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Arsenic	µg/L	0.20	1.44	0.25	0.30	3.72	0.57
Barium	µg/L	86.1	53.2	23.3	50.3	73.1	10.2
Beryllium	µg/L	0.932	0.018 J	0.1 U	1.36	0.143	0.035 J
Boron	mg/L	0.732	0.038 J	1.10	0.226	0.218	0.104
Cadmium	µg/L	0.026	0.02 U	0.021	0.315	0.009 J	0.019 J
Calcium	mg/L	4.8	38.4	17.2	11.9	2.7	164
Chloride	mg/L	2.21	17.4	13.7	31.8	28	37.3
Chromium	µg/L	0.33	0.23	0.27	0.68	0.31	0.38
Cobalt	µg/L	2.44	6.85	4.13	20.6	2.84	42.9
Combined Radium	pCi/L	0.99	2.68	1.15	1.74	2.02	1.73
Fluoride	mg/L	0.22	0.17	0.9	0.19	0.09	0.16
Lead	µg/L	0.23	0.2 U	0.2 U	0.1 J	0.07 J	0.07 J
Lithium	mg/L	0.00756	0.133	0.0690	0.184	0.00435	0.250
Mercury	µg/L	0.003 J	0.005 U	0.005 U	0.003 J	0.005 U	0.005 U
Molybdenum	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Selenium	µg/L	7.39	0.5 U	0.5 U	0.34 J	0.55	0.5 U
Sulfate	mg/L	72.4	155	139	374	10.3	1,040
Thallium	µg/L	0.2 U	0.2 U	0.11 J	0.23	0.06 J	0.05 J
Total Dissolved Solids	mg/L	190	370	300	700	140	1,710
pH	SU	4.4	5.6	5.5	4.3	4.4	5.1

Notes:

mg/L: milligrams per liter

µg/L: micrograms per liter

SU: standard unit

pCi/L: picocuries per liter

U: Parameter was not present in concentrations above method detection limit and is reported as the reporting limit

J: Estimated value. Parameter was detected in concentrations below the reporting limit

All samples were collected as part of the assessment monitoring program in accordance with Texas Administrative Code Title 30 § 352.951(a).



**Table 2: Appendix IV Groundwater Protection Standards  
Welsh Plant - Primary Bottom Ash Pond**

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.00317	0.00600
Arsenic, Total (mg/L)	0.0100	0.00628	0.0100
Barium, Total (mg/L)	2.00	0.630	2.00
Beryllium, Total (mg/L)	0.00400	0.000762	0.00400
Cadmium, Total (mg/L)	0.00500	0.00400	0.00500
Chromium, Total (mg/L)	0.100	0.00235	0.100
Cobalt, Total (mg/L)	n/a	0.0748	0.0748
Combined Radium, Total (pCi/L)	5.00	3.84	5.00
Fluoride, Total (mg/L)	4.00	0.583	4.00
Lead, Total (mg/L)	n/a	0.00338	0.00338
Lithium, Total (mg/L)	n/a	0.394	0.394
Mercury, Total (mg/L)	0.00200	0.0000330	0.00200
Molybdenum, Total (mg/L)	n/a	0.00243	0.00243
Selenium, Total (mg/L)	0.0500	0.0160	0.0500
Thallium, Total (mg/L)	0.00200	0.00125	0.00200

Notes:

MCL = Maximum Contaminant Level

GWPS = Groundwater Protection Standard

Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

Grey cells indicate the GWPS is based on the calculated UTL, which is either higher than the MCL or an MCL does not exist.

**Table 3 - Appendix III Data Summary  
Welsh Plant - Primary Bottom Ash Pond**

Analyte	Unit	Description	AD-8	AD-9	AD-15
			10/19/2021	10/19/2021	10/19/2021
Boron	mg/L	Interwell Background Value (UPL)	0.801		
		Analytical Result	<b>1.10</b>	0.226	0.218
Calcium	mg/L	Intrawell Background Value (UPL)	30.2	292	4.97
		Analytical Result	17.2	11.9	2.7
Chloride	mg/L	Intrawell Background Value (UPL)	27.6	127	38.6
		Analytical Result	13.7	31.8	28.0
Fluoride	mg/L	Intrawell Background Value (UPL)	1.02	0.766	1.00
		Analytical Result	0.9	0.19	0.09
pH	SU	Interwell Background Value (UPL)	7.0		
		Interwell Background Value (LPL)	4.8		
		Analytical Result	5.5	<b>4.3</b>	<b>4.4</b>
Sulfate	mg/L	Intrawell Background Value (UPL)	214	2,370	32.5
		Analytical Result	139	374	10.3
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	514	2,870	282
		Analytical Result	300	700	140

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

# ATTACHMENT A

Certification by Qualified Professional Engineer

**Certification by Qualified Professional Engineer**

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

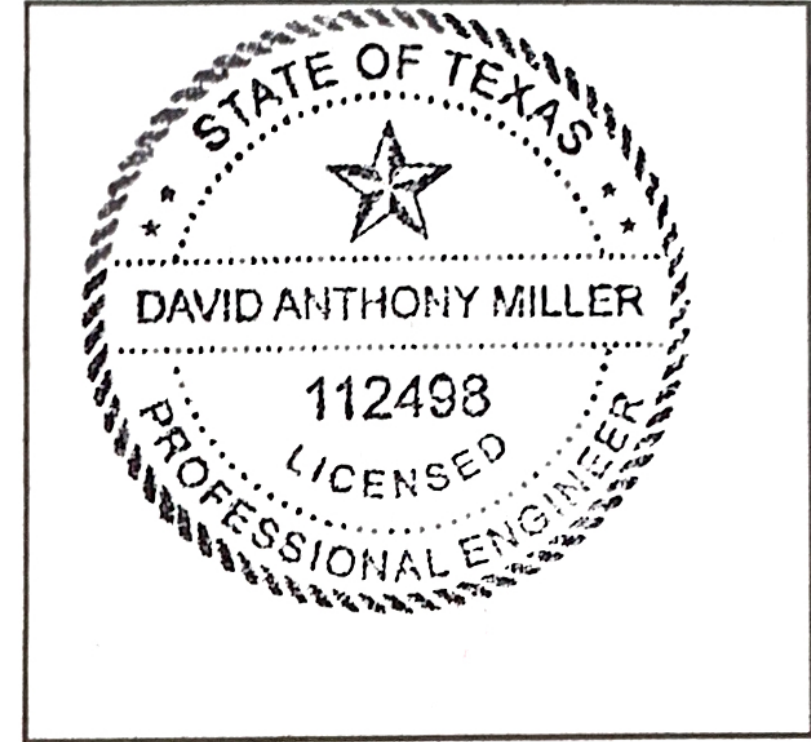
DAVID ANTHONY MILLER  
Printed Name of Licensed Professional Engineer

David Anthony Miller  
Signature

112498  
License Number

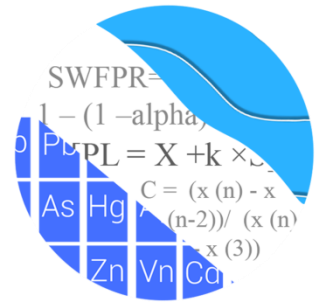
TEXAS  
Licensing State

02.16.22  
Date



**ATTACHMENT B**  
**Statistical Analysis Output**

## GROUNDWATER STATS CONSULTING



February 1, 2022

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

Re: Welsh PBAP - Assessment Monitoring Event & Background Update 2021

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis and background update of 2021 groundwater data for American Electric Power Inc.'s Welsh PBAP. The analysis complies with the Texas Commission of Environmental Quality Rule 30 TAC 352 as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the Coal Combustion Residuals (CCR) program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-1, AD-5, and AD-17
- **Downgradient wells:** AD-8, AD-9, and AD-15

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

The CCR program consists of the following constituents:

- **Appendix III** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS

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

Time series plots for Appendix III and IV parameters are provided for all wells and constituents, and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are 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. Values flagged as outliers may be seen in the Outlier Summary following this letter (Figure C) and are plotted in a lighter font and disconnected symbol on the time series graphs.

### **Summary of Statistical Method:**

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

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of an additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified and further research would be required to identify the cause of the exceedance (i.e., impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is considered to be a false positive result and, therefore, no further action is necessary.

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. 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 in background, 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. 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 will be necessary to accommodate these types of changes. In the interwell case, newer data will be included in background during each sample event after screening the upgradient well data for any new outliers. Data will also be periodically evaluated for statistically significant trends, and earlier data may be deselected prior to construction of statistical limits so that limits represent present-day conditions. In the intrawell case, data for all wells and constituents are 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 are deselected prior to construction of limits in order 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.

## **Summary of Background Screening Conducted in December 2017**

### Outlier Evaluation

Time series plots were used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix III and Appendix IV parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Tukey's outlier test noted a few outliers that were flagged as outliers and a summary of those values was submitted with the screening. The outliers identified by Tukey's test for TDS in well AD-15, however, were not flagged as these values were not unusual to the data set at the time and were similar to observations reported in neighboring wells. However, the measured concentrations of most metals for September 30, 2016 at well AD-15 are high compared to the rest of the observations, which suggests a possible laboratory problem. These values were flagged as outliers as they do not appear to



represent the population at this well. Flagged values may be seen in a lighter font on the time series graphs. Note that reporting limits have recently decreased; therefore, no non-detect substitution was made for the data. During the next background update, the more historical and higher reporting limits may be deselected providing there are sufficient samples to construct statistical limits.

### Seasonality

No true seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release. It was noted that for each constituent evaluated, the highest concentrations are reported in the upgradient wells.

### Trend Test Evaluation

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a couple statistically significant decreasing trends that were relatively low in magnitude when compared to average concentrations; therefore, no adjustments were required.

### Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) was used to statistically evaluate differences in average concentrations among upgradient wells, which assists in identifying the most appropriate statistical approach. Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare

compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

As a result of the screening, intrawell prediction limits were determined to be most appropriate for calcium, fluoride, sulfate, and TDS while interwell prediction limits were appropriate for boron and pH. A summary of these findings was included with the report.

## **Appendix III Background Update Summaries**

### **December 2020**

Prior to updating background data for the 2020 analysis, data were evaluated using Tukey's outlier test and visual screening for updating background limits through May 2020 on all wells for parameters that use intrawell prediction limits (calcium, chloride, fluoride, sulfate, and TDS) and through October 2020 on upgradient wells for parameters that use interwell prediction limits (boron and pH). Tukey's test did not identify any new outliers except for calcium at upgradient well AD-17. This value was not flagged as an outlier as the value appears similar to the surrounding population.

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through February 2019 to the new compliance samples at each well through May 2020 to evaluate whether the groups are statistically different at the 99% confidence level, in which case background data may not be updated with more recent compliance data. Statistically significant differences were found for chloride in upgradient well AD-1 and downgradient well AD-8, as well as all fluoride in all upgradient wells and downgradient well AD-15. All well/constituent pairs for parameters using intrawell prediction limits were updated with compliance samples to use all historical data through May 2020, with the exception of chloride in downgradient well AD-8 and fluoride in downgradient well AD-17. These well/constituent pairs were truncated to use measurements from January 2017 through May 2020.

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron and pH to identify statistically significant increasing or decreasing trends. The results of the trend analyses showed a statistically significant increasing trend for boron in upgradient well AD-1. However, the magnitude of the trend was low relative to the average concentrations in this well. Therefore, no adjustment was required at this time.

All well/constituent pairs for parameters using interwell prediction limits were updated to use all historical data through October 2020. A summary of the background update results was included in the December 2020 report.

## **February 2022**

### Outlier Analysis

Prior to updating background data during this analysis, Tukey's outlier test and visual screening were used to re-evaluate data through October 2021 at all upgradient wells for parameters utilizing interwell prediction limits (boron and pH). Tukey's outlier test did not identify any values as potential outliers; therefore, no new values were flagged as outliers and no changes were made to previously flagged outliers for these constituents. Tukey's outlier test results for all Appendix III parameters are shown in Figure C.

For parameters which use intrawell prediction limits (calcium, chloride, fluoride, sulfate, and TDS), values were not re-evaluated for new outliers as these records had insufficient samples for updating background during this evaluation period. However, a value of 9 mg/L for chloride in upgradient well AD-1 was flagged during this analysis in order to be consistent with the shared upgradient well network among Welsh sites. A list of all flagged values follows this report (Figure C).

### Intrawell – Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, are constructed using historical data through May 2020 (except for chloride at well AD-8 and fluoride at well AD-17 as discussed above) for calcium, chloride, fluoride, sulfate, and TDS (Figure D). Background data sets for all parameters utilizing intrawell prediction limits will be updated after the Fall 2022 sample event when a minimum of 4 compliance samples are available. A summary table of the limits follows this report.

### Interwell – Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron and pH to identify statistically significant increasing or decreasing trends (Figure E). The results of the trend analyses showed a statistically significant increasing trend for boron in upgradient well AD-1 as well as a decreasing trend for pH in upgradient well AD-17. However, the magnitude of the trends was low relative to the average concentrations in this well; therefore, no adjustment was required at this time.

## Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells through October 2021 for boron and pH (Figure F). Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent. A summary table of the updated limits may be found following this letter in the Prediction Limit Summary Tables.

## **Evaluation of Appendix IV Parameters – October 2021**

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. All flagged values may be seen on the Outlier Summary following this letter (Figure C) and no changes to previously flagged outliers were made.

For the current analysis, Tukey's outlier test on pooled upgradient well data through October 2021 identified outliers for fluoride, lead, and mercury. The values identified by Tukey's test were either similar to concentrations upgradient of the facility or were lower than the respective Maximum Contaminant Level (MCL); therefore, none of these values were flagged as outliers. Although not identified by Tukey's test, the highest value for molybdenum in upgradient well AD-1 and two highest values for cadmium in upgradient well AD-17 were flagged in order to maintain statistical limits that are conservative (i.e., lower) from a regulatory perspective.

Additionally, downgradient well data through October 2021 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No new outliers among downgradient wells were flagged during this analysis. All flagged values may be seen on the Outlier Summary following this letter (Figure C) and no changes to previously flagged outliers were made.

## Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through October 2021 for Appendix IV parameters (Figure G). For parametric limits a target of 95% confidence and 95% coverage is used. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

## Groundwater Protection Standards

These background limits were compared to the Maximum Contaminant Levels (MCLs) as shown in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the confidence interval comparisons (Figure H).

## Confidence Intervals

Confidence intervals were then constructed using data through October 2021 on downgradient wells for each of the Appendix IV parameters and compared to the GWPS, (i.e., the highest limit of the MCL or background limit as discussed above). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete graphical results of the confidence intervals follow this letter (Figure I). No statistical exceedances were identified.

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

For Groundwater Stats Consulting,

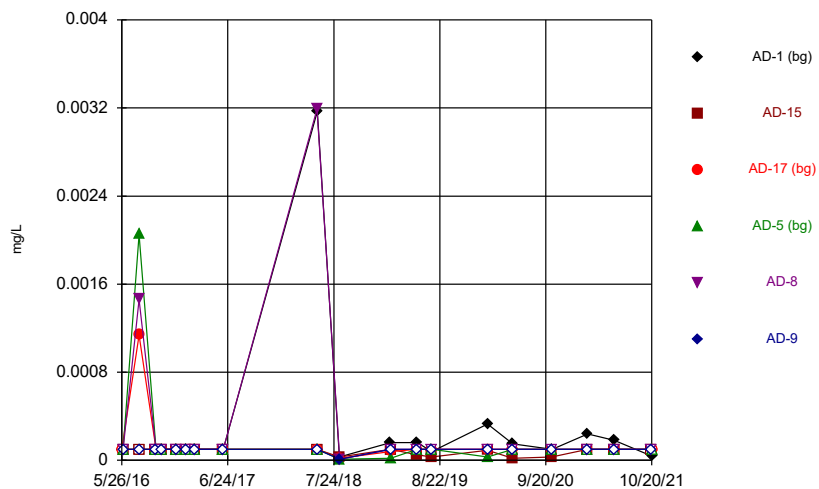


Easton Rayner  
Groundwater Analyst



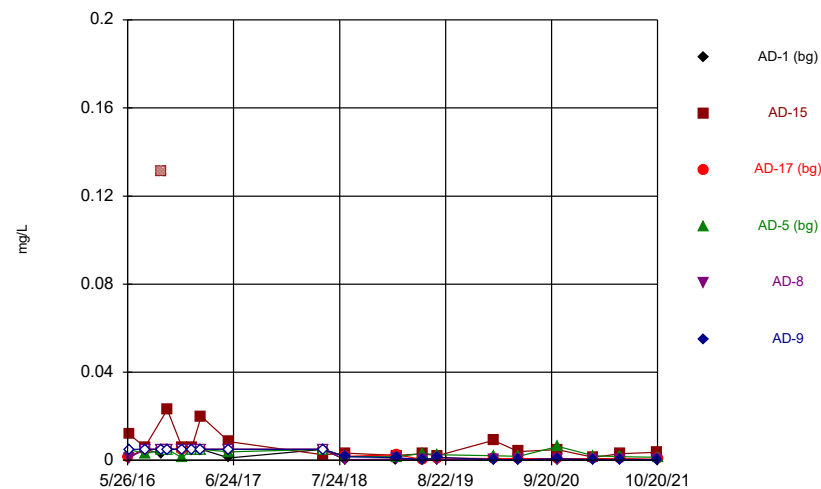
Andrew Collins  
Project Manager

### Time Series



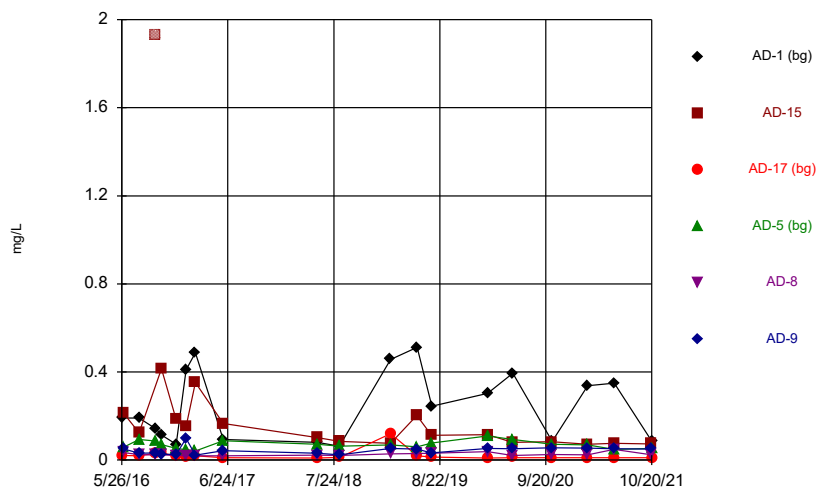
Constituent: Antimony, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



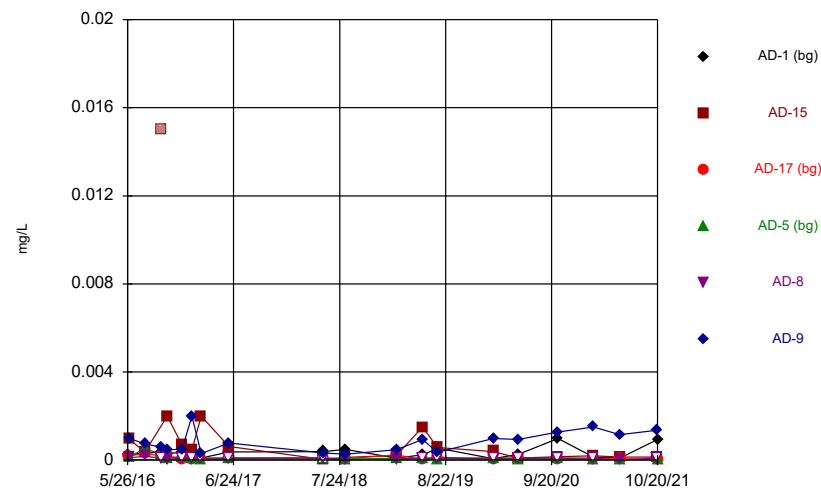
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



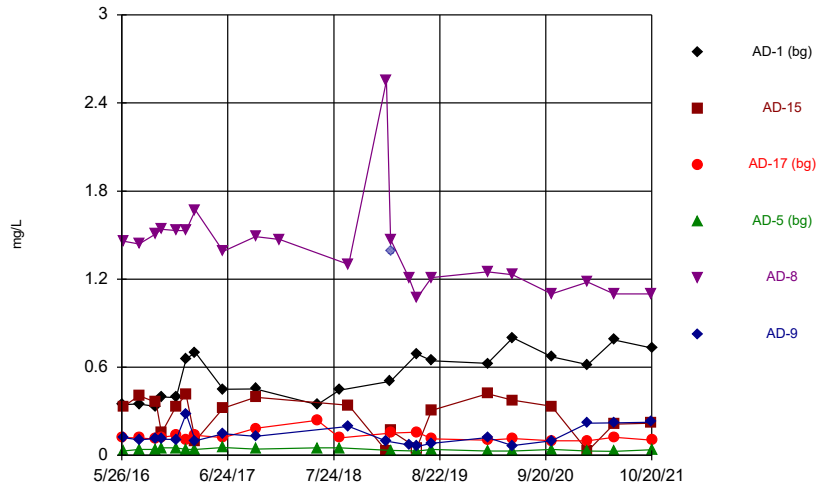
Constituent: Barium, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



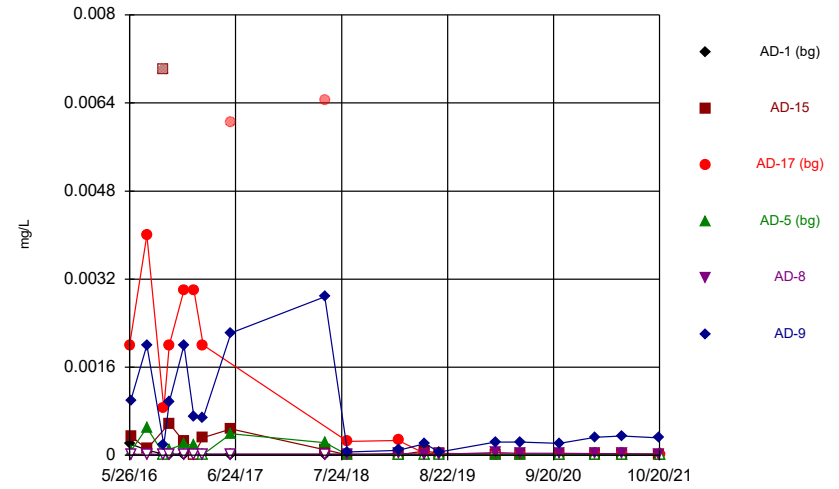
Constituent: Beryllium, total Analysis Run 2/1/2022 9:33 AM  
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### Time Series



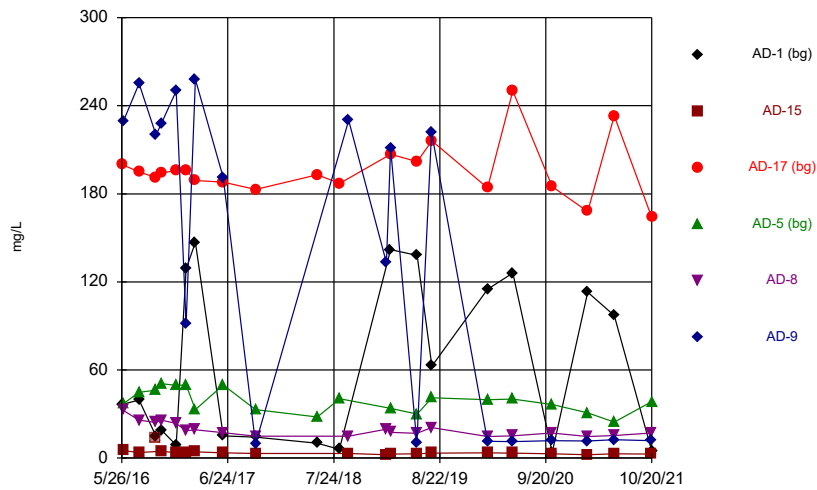
Constituent: Boron, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



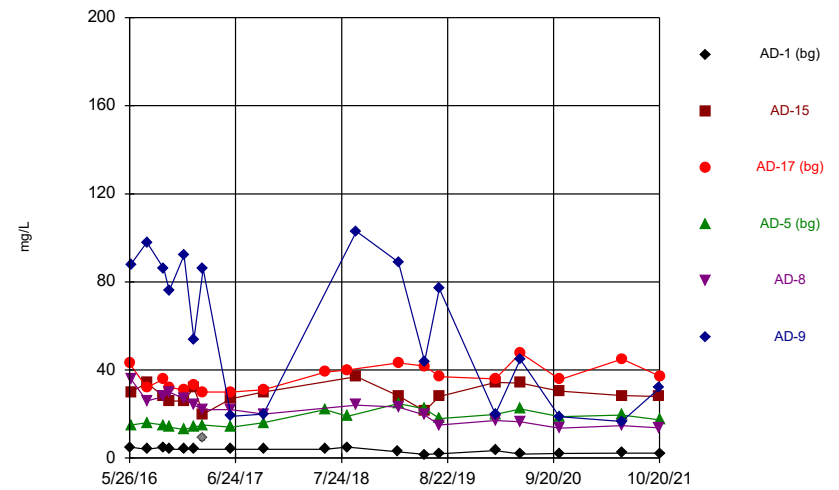
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



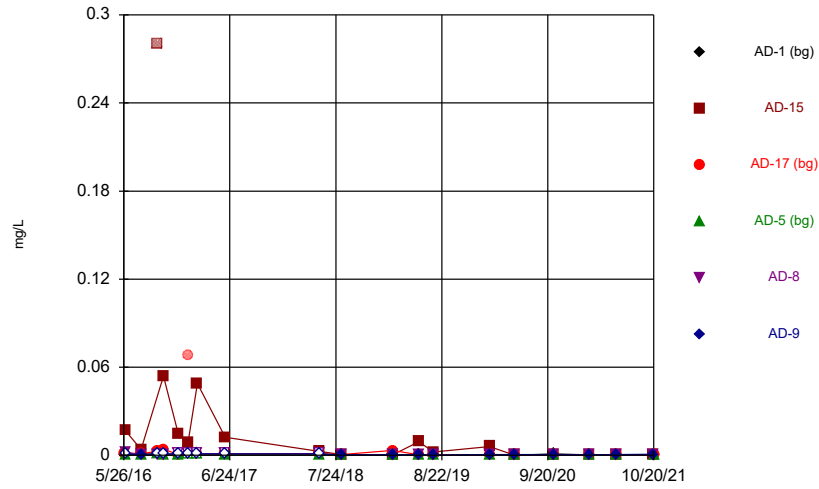
Constituent: Calcium, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



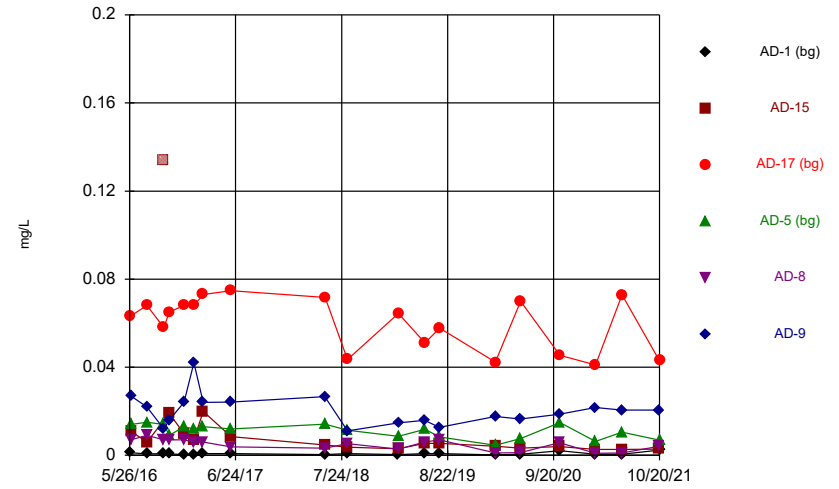
Constituent: Chloride, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



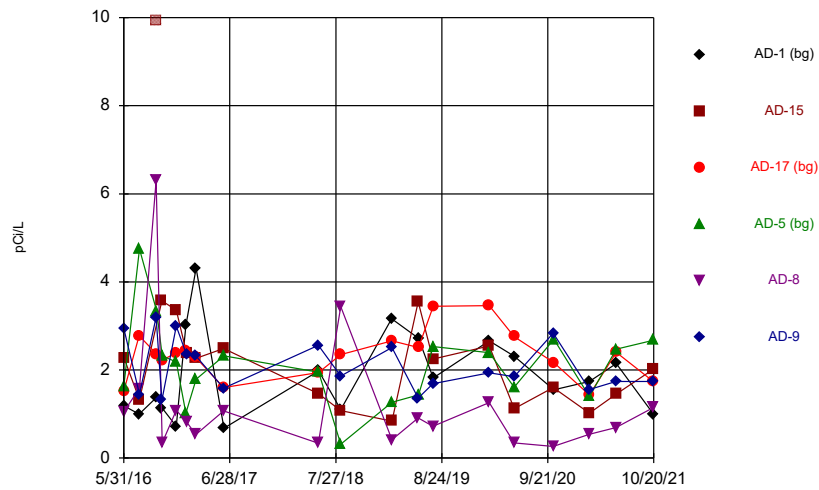
Constituent: Chromium, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



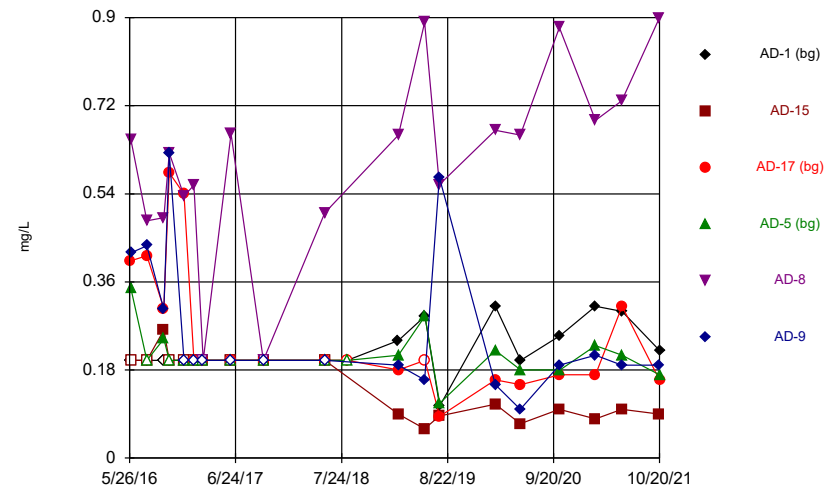
Constituent: Cobalt, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

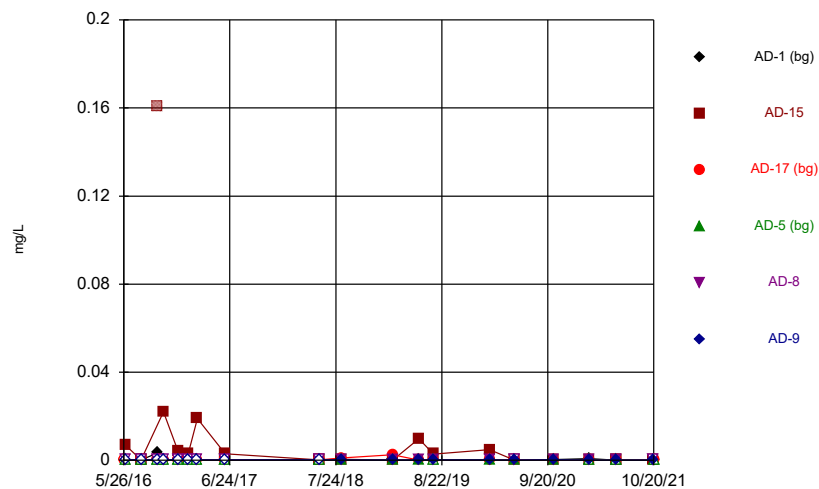
### Time Series



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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

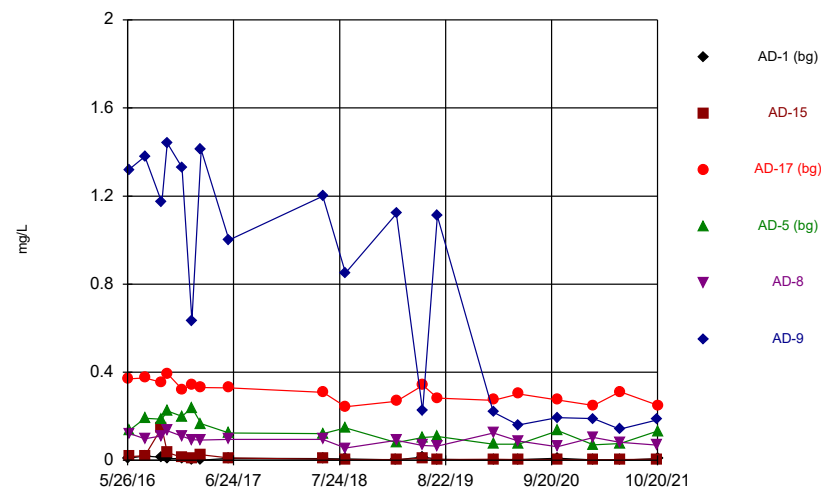


### Time Series



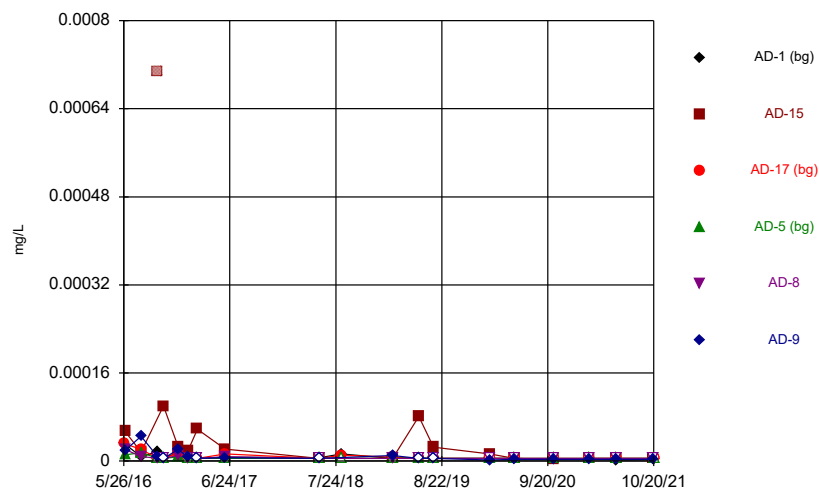
Constituent: Lead, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



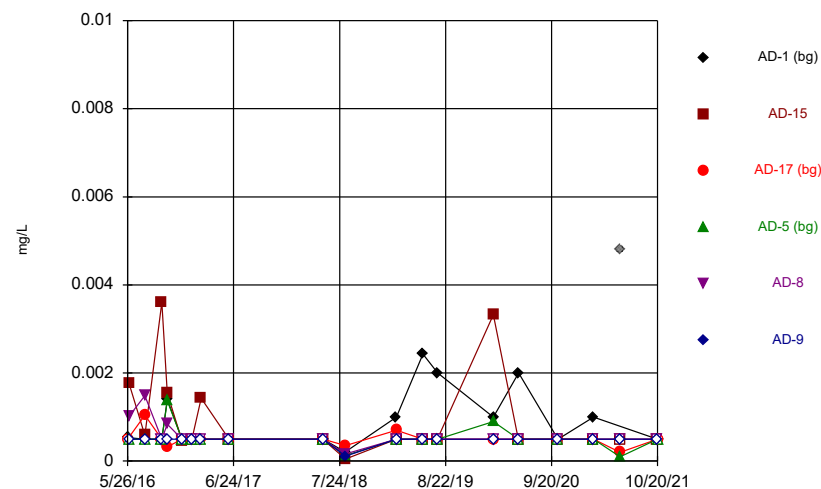
Constituent: Lithium, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



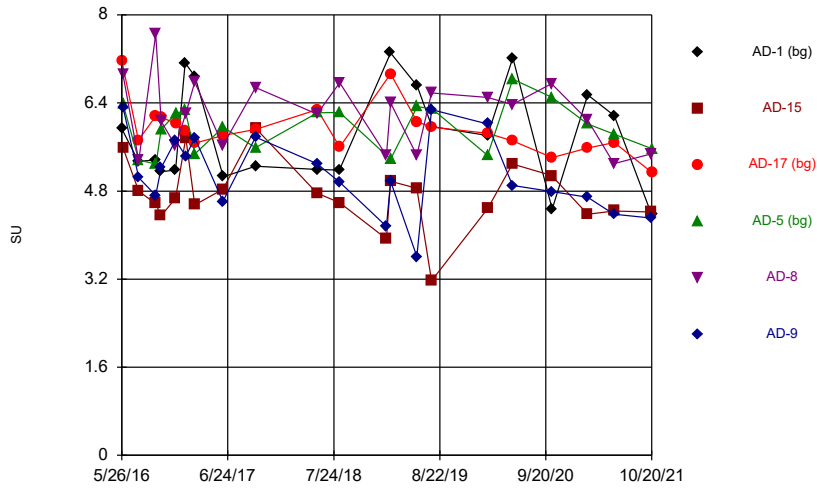
Constituent: Mercury, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



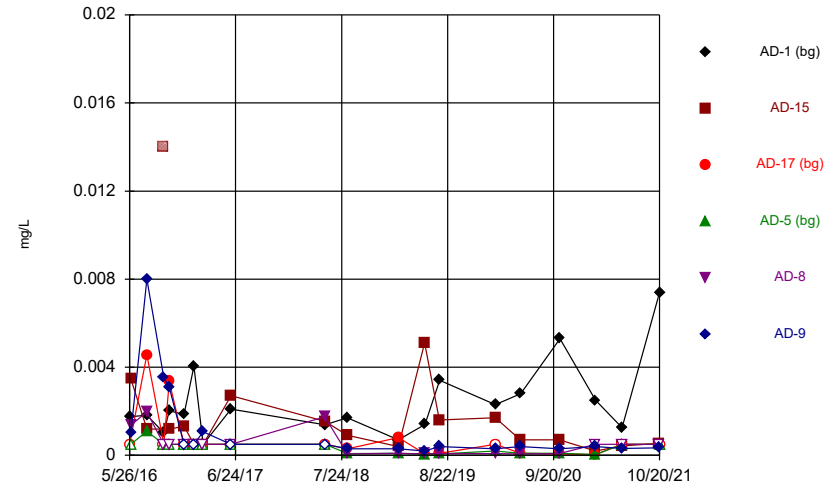
Constituent: Molybdenum, total Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Time Series



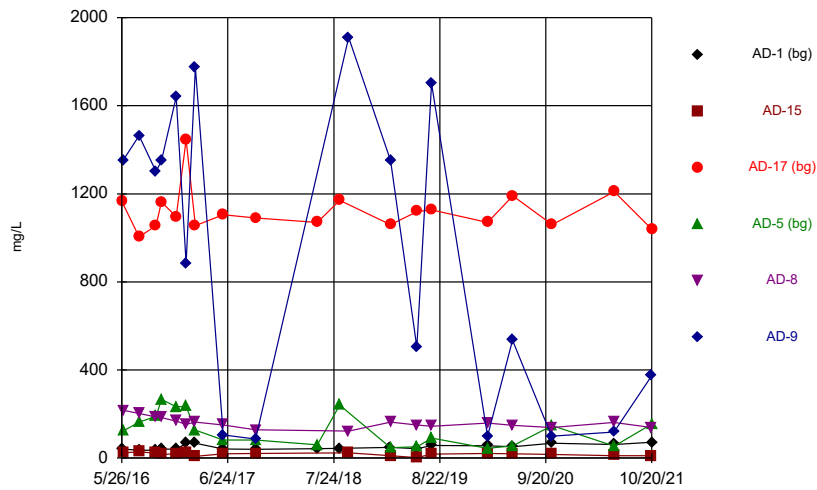
Constituent: pH, field Analysis Run 2/1/2022 9:33 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Time Series



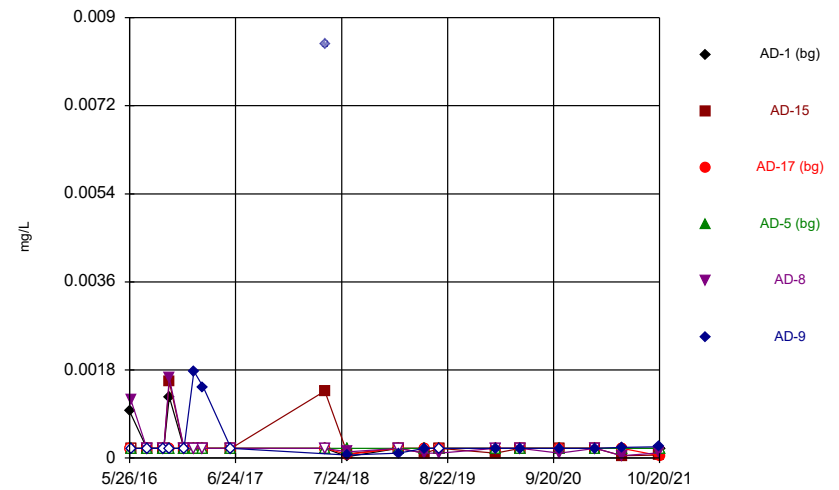
Constituent: Selenium, total Analysis Run 2/1/2022 9:33 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Time Series



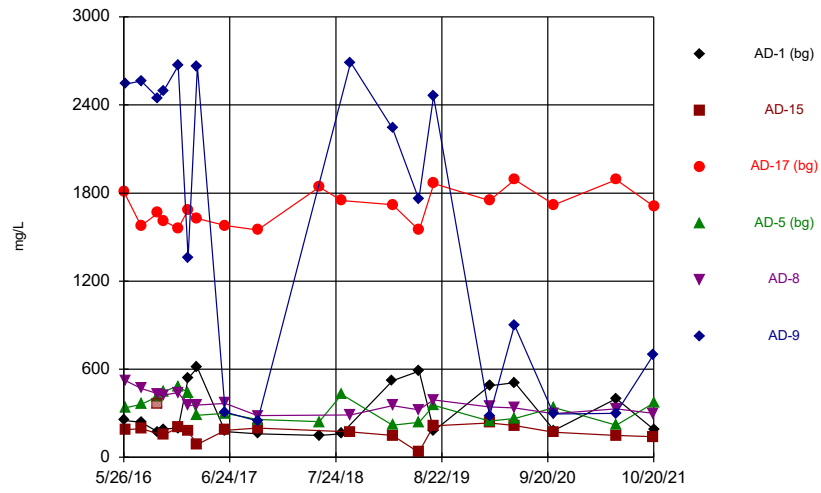
Constituent: Sulfate, total Analysis Run 2/1/2022 9:33 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Time Series



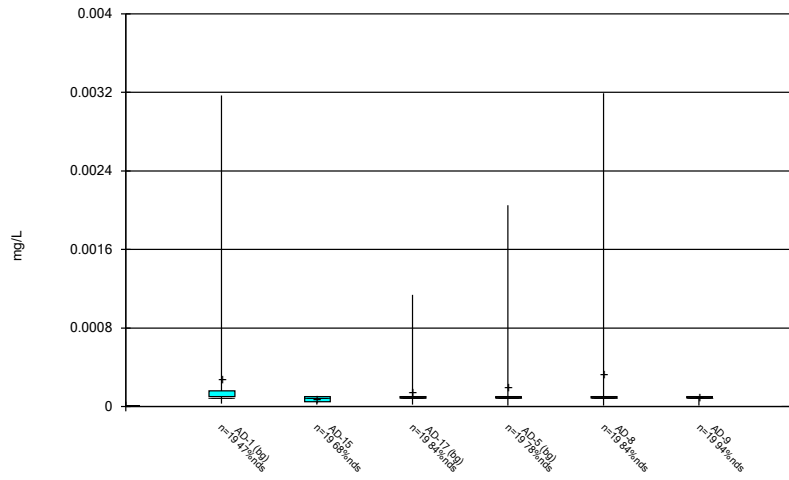
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



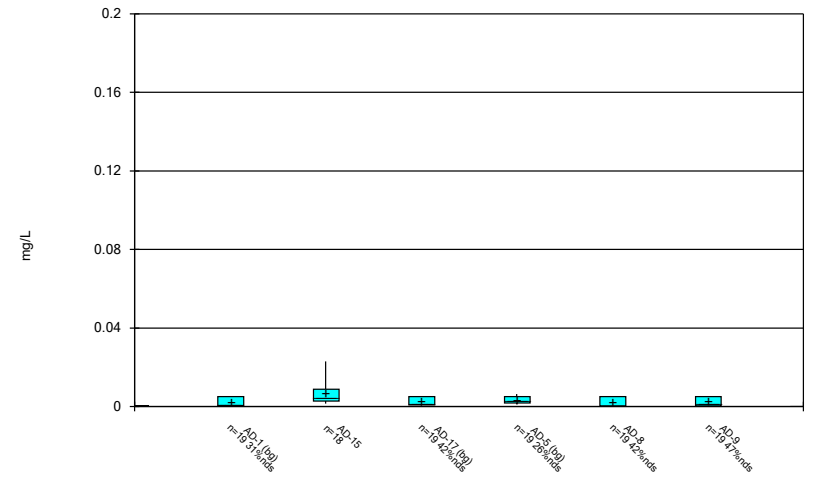
Constituent: Total Dissolved Solids Analysis Run 2/1/2022 9:33 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



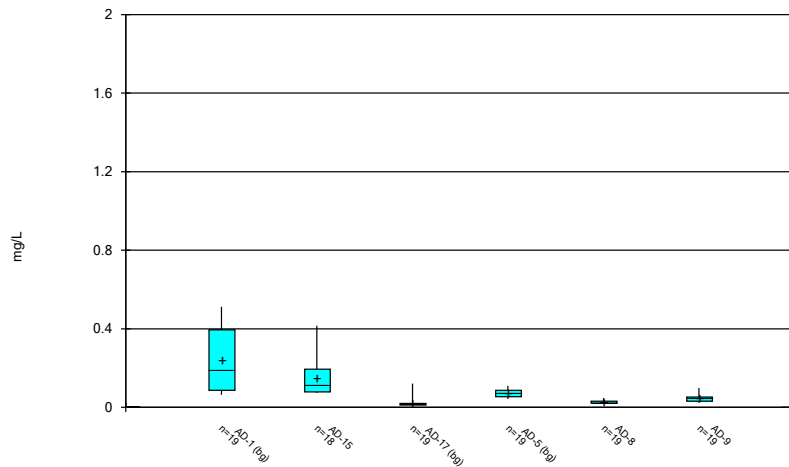
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



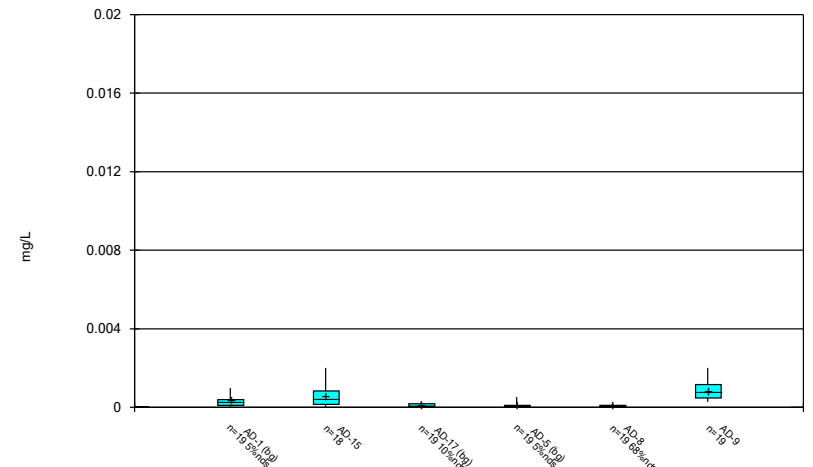
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



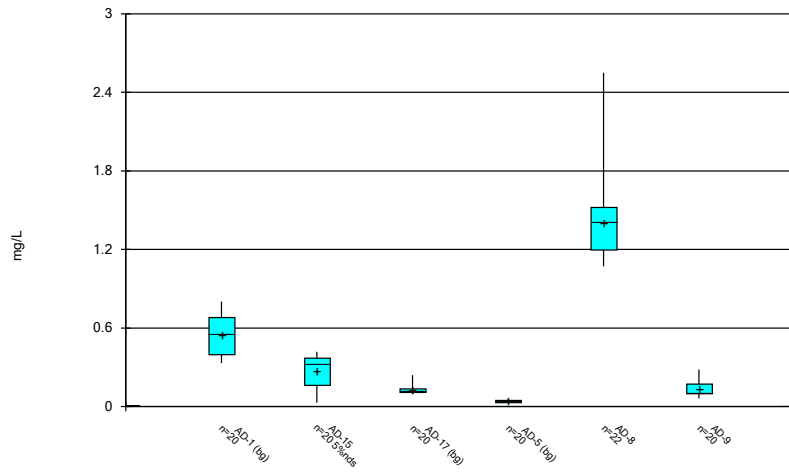
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



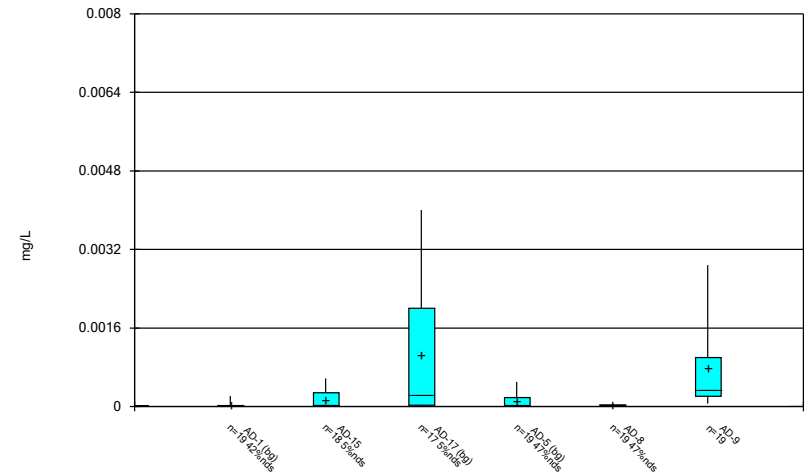
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



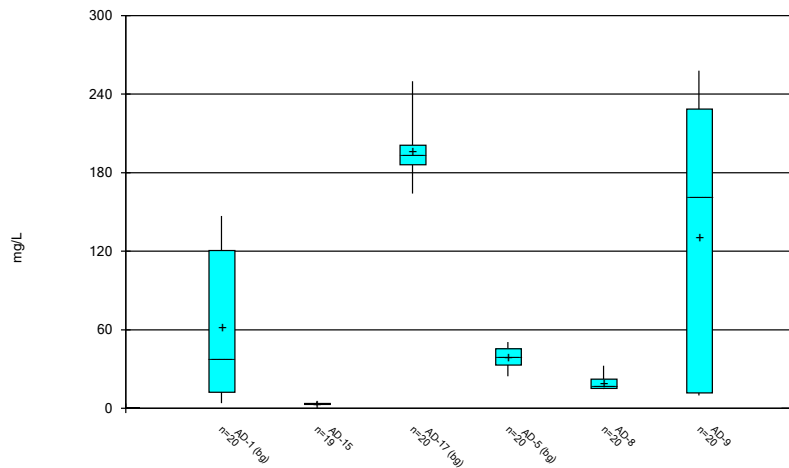
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



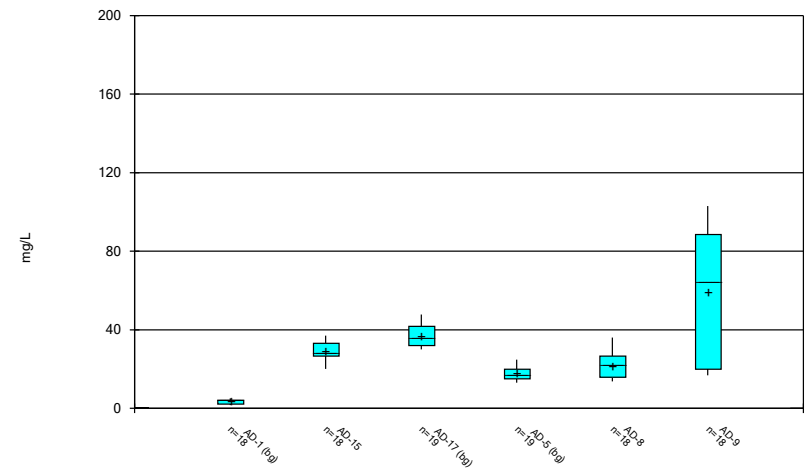
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



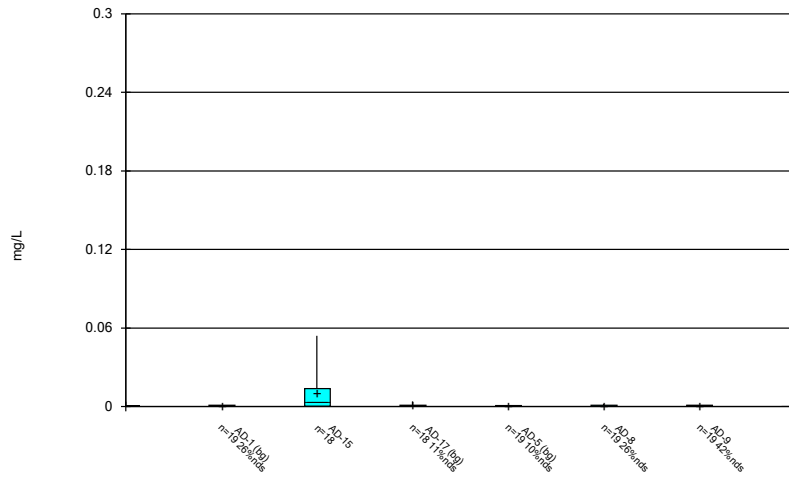
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Box & Whiskers Plot



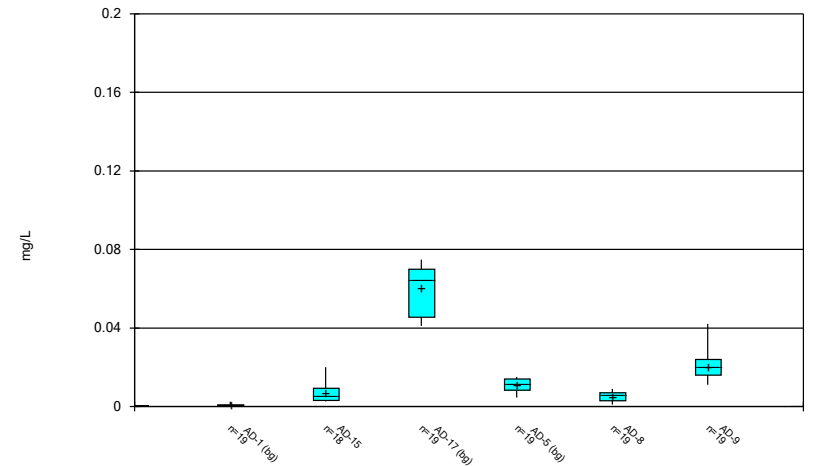
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



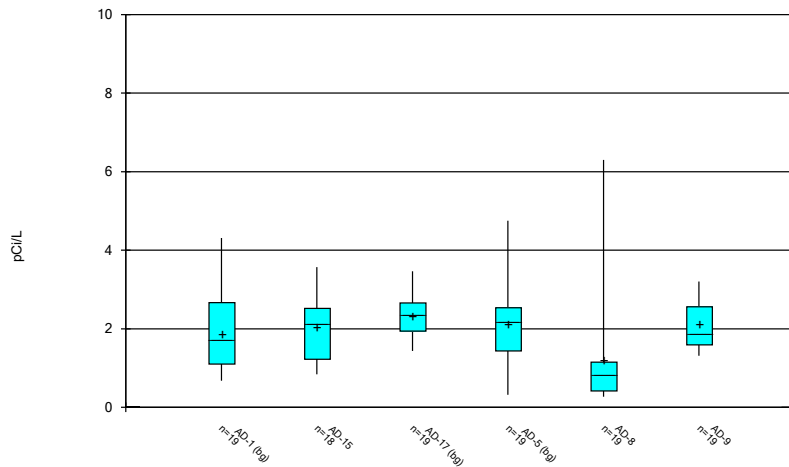
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



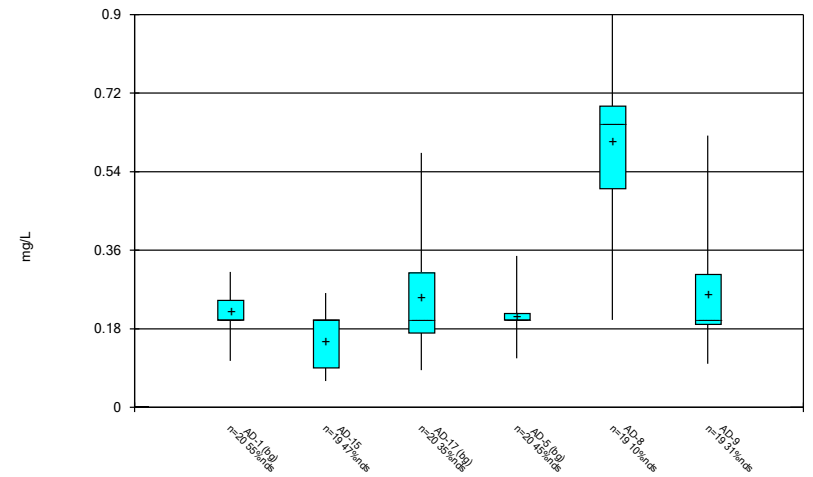
Constituent: Cobalt, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



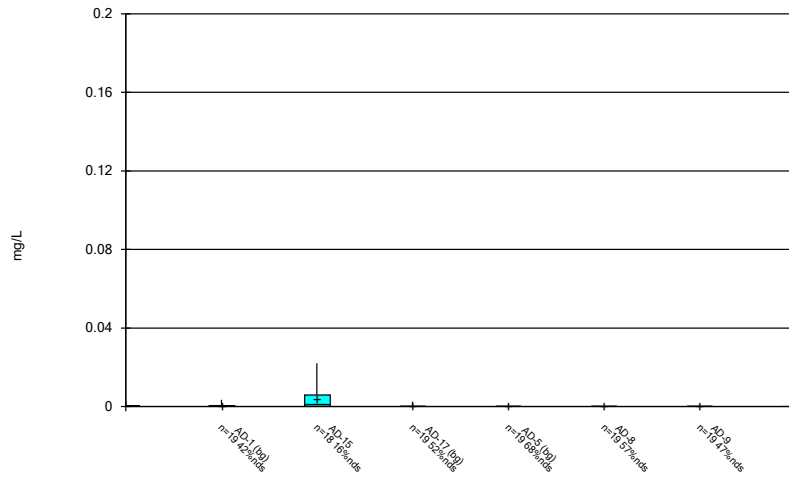
Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



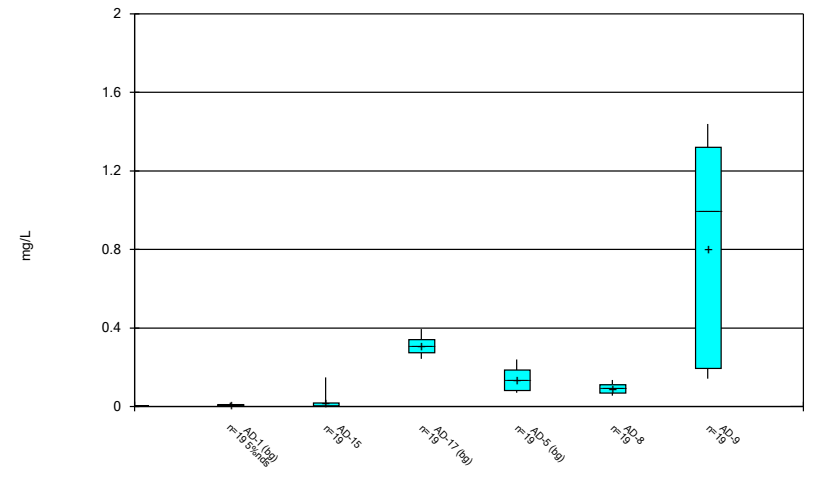
Constituent: Fluoride, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



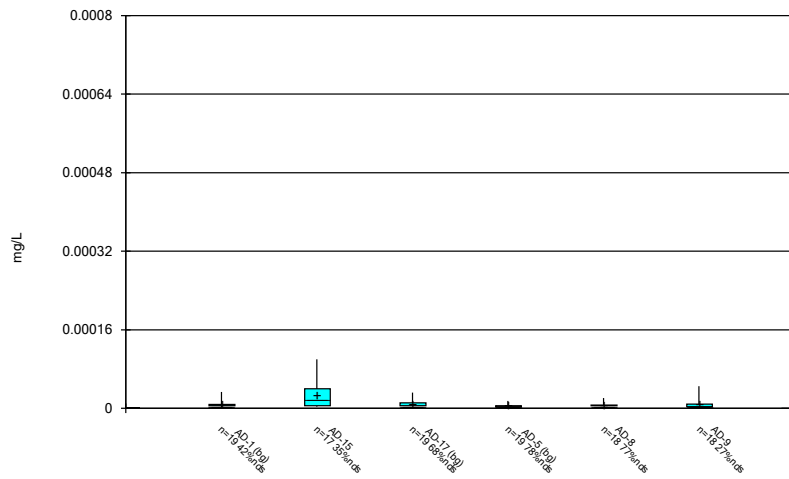
Constituent: Lead, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



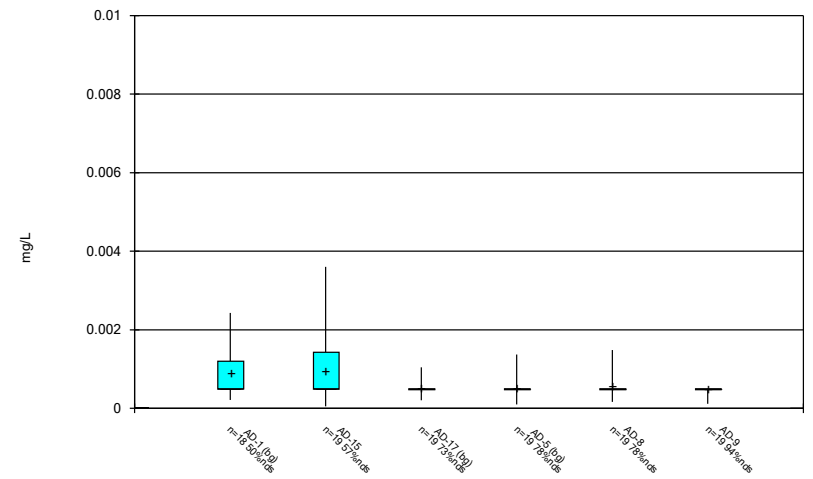
Constituent: Lithium, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



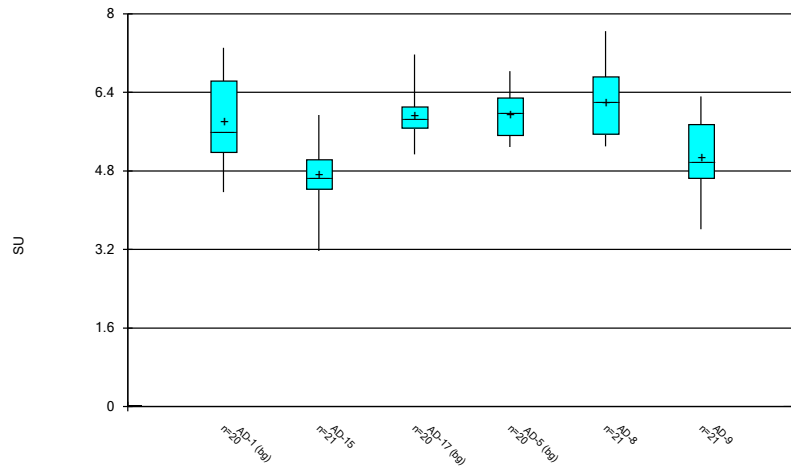
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



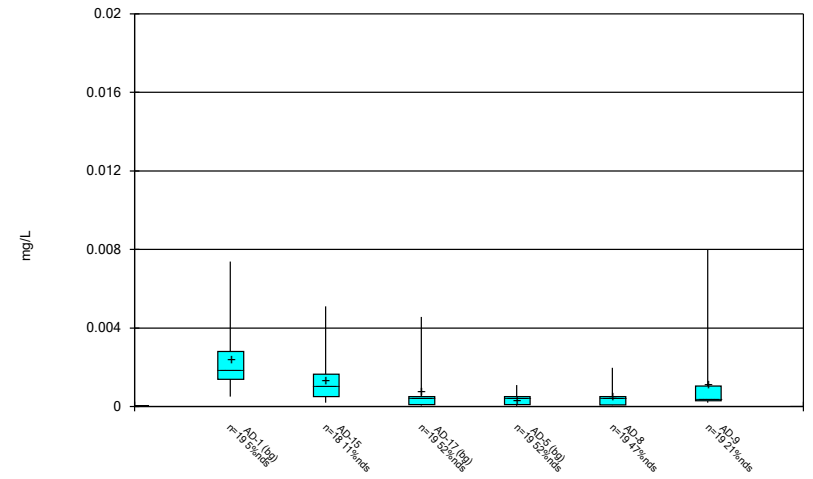
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



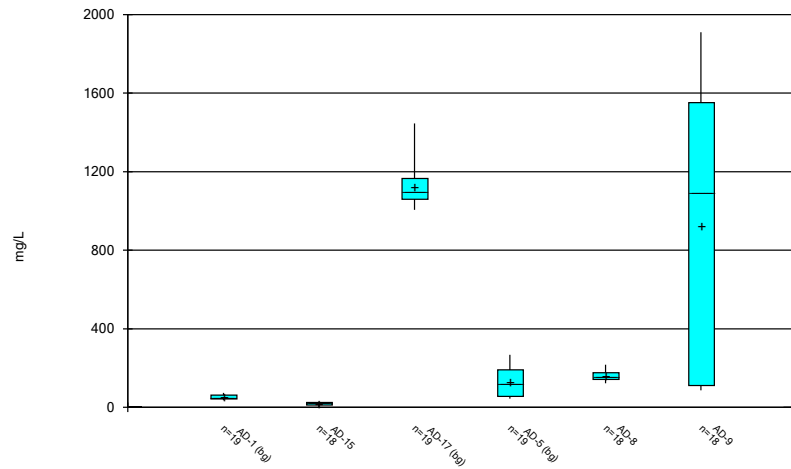
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



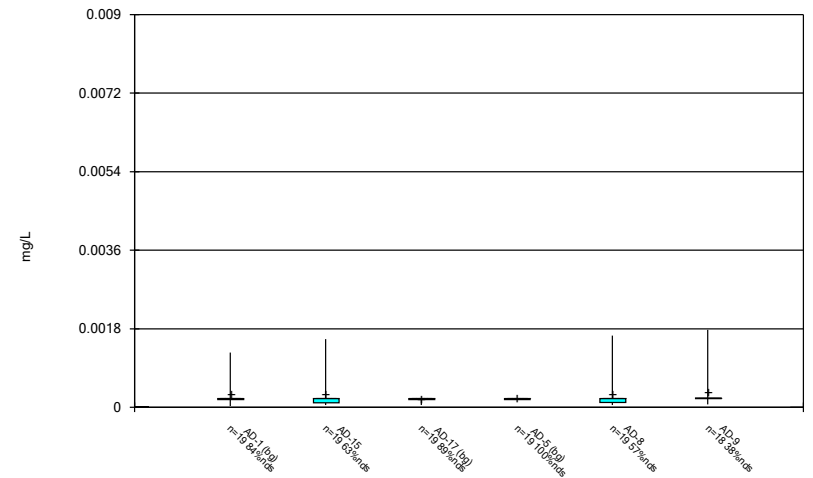
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 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



Constituent: Sulfate, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

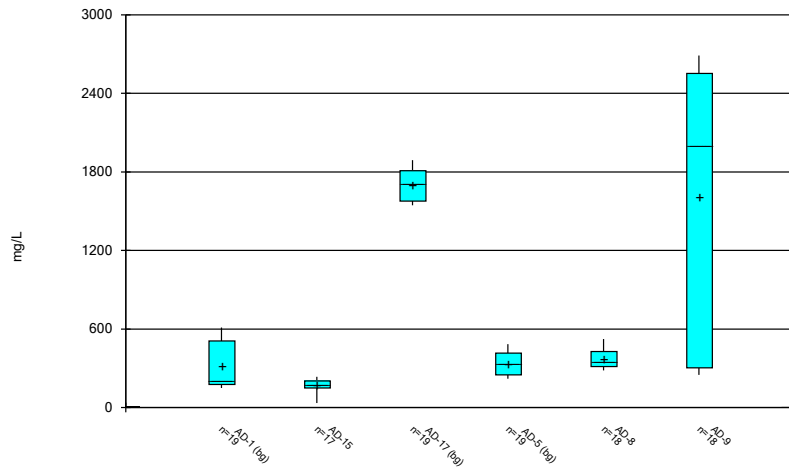
Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 2/1/2022 9:35 AM  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



### Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 2/1/2022 9:35 AM  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

# Outlier Summary

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 9:34 AM

Date	AD-15 Arsenic, total (mg/L)	AD-15 Barium, total (mg/L)	AD-15 Beryllium, total (mg/L)	AD-9 Boron, total (mg/L)	AD-15 Cadmium, total (mg/L)	AD-17 Cadmium, total (mg/L)	AD-15 Calcium, total (mg/L)	AD-1 Chloride, total (mg/L)	AD-15 Chromium, total (mg/L)	AD-17 Chromium, total (mg/L)
9/29/2016										
9/30/2016	0.131 (o)	1.93 (o)	0.015 (o)		0.007 (o)		13.7 (o)		0.28 (o)	
1/20/2017										0.068 (o)
2/24/2017								9 (o)		
6/8/2017					0.00606 (o)					
5/23/2018										
5/24/2018					0.00646 (o)					
2/21/2019				1.39 (o)						
6/2/2021										

Date	AD-15 Cobalt, total (mg/L)	AD-15 Combined Radium 226 + 228 (pCi/L)	AD-15 Lead, total (mg/L)	AD-15 Mercury, total (mg/L)	AD-1 Molybdenum, total (mg/L)	AD-15 Selenium, total (mg/L)	AD-9 Thallium, total (mg/L)	AD-15 Total Dissolved Solids (mg/L)
9/29/2016								
9/30/2016	0.134 (o)	9.92 (o)	0.161 (o)	0.000707 (o)	0.014 (o)		367 (o)	
1/20/2017								
2/24/2017								
6/8/2017								
5/23/2018						0.00846 (o)		
5/24/2018								
2/21/2019								
6/2/2021				0.0048 (o)				

# Tukey's Outlier Test - Upgradient Wells - Significant Results

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 12:34 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Fluoride, total (mg/L)	AD-1,AD-17,AD-5	Yes	0.106,0.4023,0.4135,0.583,0.5399,0.085,0.112	NP	NaN	60	0.2275	0.08694	In(x)	ShapiroFrancia
Lead, total (mg/L)	AD-1,AD-17,AD-5	Yes	0.003384,0.000852,0.0011,0.00249,0.00003	NP	NaN	57	0.0002972	0.0005397	In(x)	ShapiroFrancia
Mercury, total (mg/L)	AD-1,AD-17,AD-5	Yes	0.000033,0.000032,0.00002133	NP	NaN	57	0.000007595	0.00000614	In(x)	ShapiroFrancia

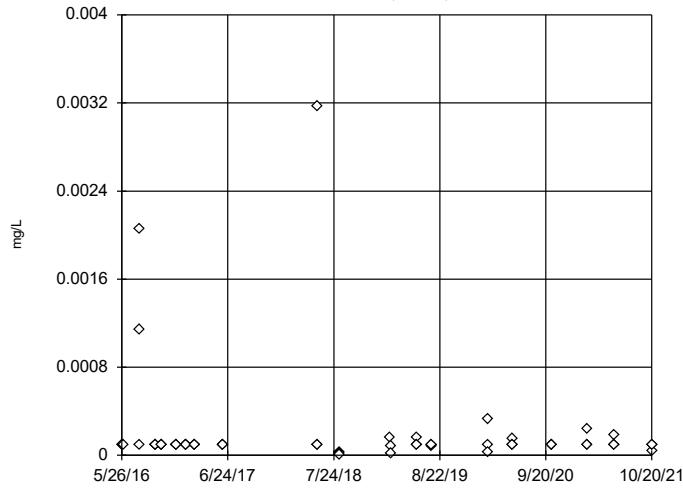
# Tukey's Outlier Test - Upgradient Wells - All Results

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 12:34 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	AD-1,AD-17,AD-5	n/a	n/a	NP	NaN	57	0.0002086	0.0004957	unknown	ShapiroFrancia
Arsenic, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.002696	0.001965	ln(x)	ShapiroFrancia
Barium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.1113	0.1321	ln(x)	ShapiroFrancia
Beryllium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.0002088	0.0002158	ln(x)	ShapiroFrancia
Boron, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	60	0.2382	0.2418	ln(x)	ShapiroFrancia
Cadmium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.0005722	0.001384	ln(x)	ShapiroFrancia
Chromium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.001833	0.008953	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.02391	0.02704	x^(1/3)	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	2.108	0.8532	sqrt(x)	ShapiroFrancia
<b>Fluoride, total (mg/L)</b>	<b>AD-1,AD-17,AD-5</b>	<b>Yes</b>	<b>0.106,0.4023,0.4135,0.583,0.5399,0.085,0.112</b>	<b>NP</b>	<b>NaN</b>	<b>60</b>	<b>0.2275</b>	<b>0.08694</b>	<b>ln(x)</b>	<b>ShapiroFrancia</b>
<b>Lead, total (mg/L)</b>	<b>AD-1,AD-17,AD-5</b>	<b>Yes</b>	<b>0.003384,0.000852,0.0011,0.00249,0.00003</b>	<b>NP</b>	<b>NaN</b>	<b>57</b>	<b>0.0002972</b>	<b>0.0005397</b>	<b>ln(x)</b>	<b>ShapiroFrancia</b>
Lithium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.1515	0.132	sqrt(x)	ShapiroFrancia
<b>Mercury, total (mg/L)</b>	<b>AD-1,AD-17,AD-5</b>	<b>Yes</b>	<b>0.000033,0.000032,0.00002133</b>	<b>NP</b>	<b>NaN</b>	<b>57</b>	<b>0.000007595</b>	<b>0.00000614</b>	<b>ln(x)</b>	<b>ShapiroFrancia</b>
Molybdenum, total (mg/L)	AD-1,AD-17,AD-5	n/a	n/a	NP	NaN	57	0.0007102	0.0007011	unknown	ShapiroFrancia
pH, field (SU)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	60	5.902	0.6318	sqrt(x)	ShapiroFrancia
Selenium, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	NP	NaN	57	0.001165	0.001465	ln(x)	ShapiroFrancia
Thallium, total (mg/L)	AD-1,AD-17,AD-5	n/a	n/a	NP	NaN	57	0.0002239	0.000175	unknown	ShapiroFrancia

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

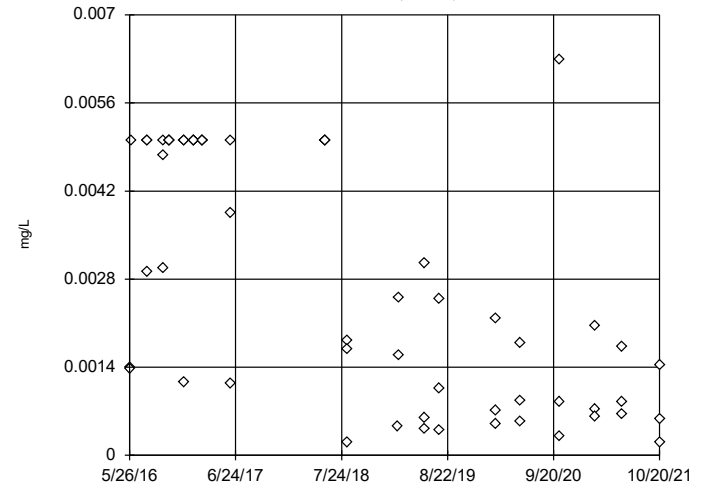


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

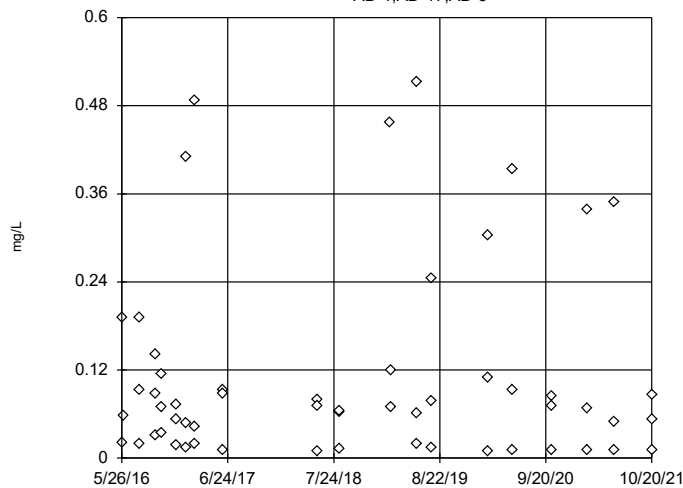


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.275, low cutoff = 0.00003091, based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

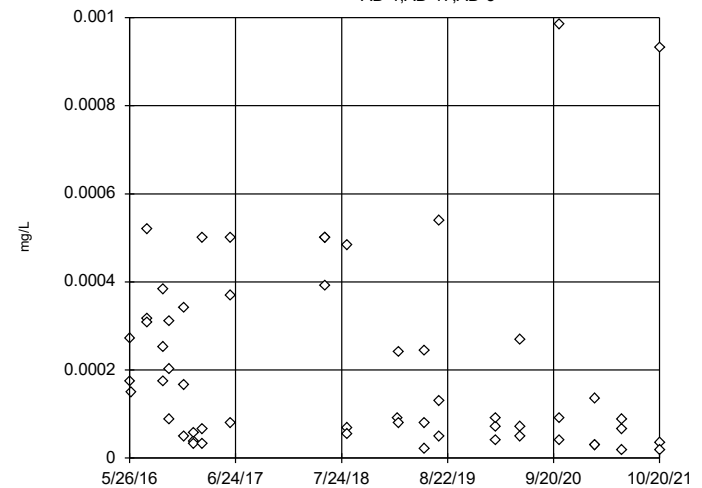


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 19.3, low cutoff = 0.0001155, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

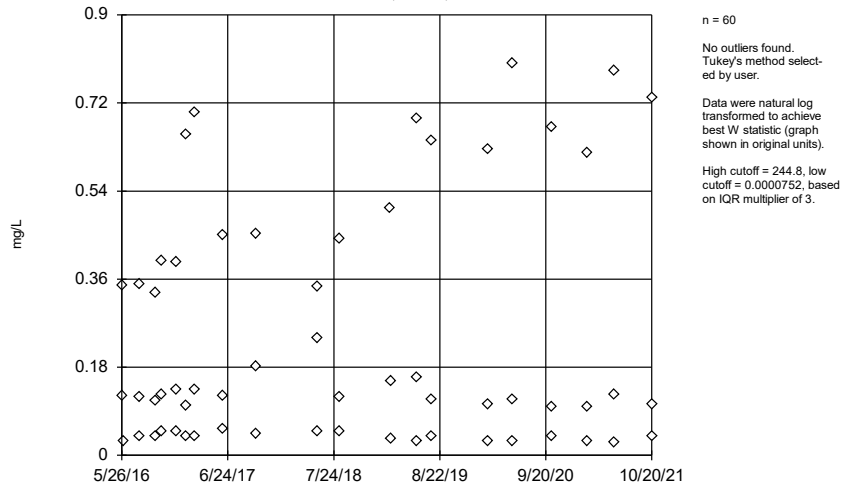


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.06692, low cutoff = 2.5e-7, based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

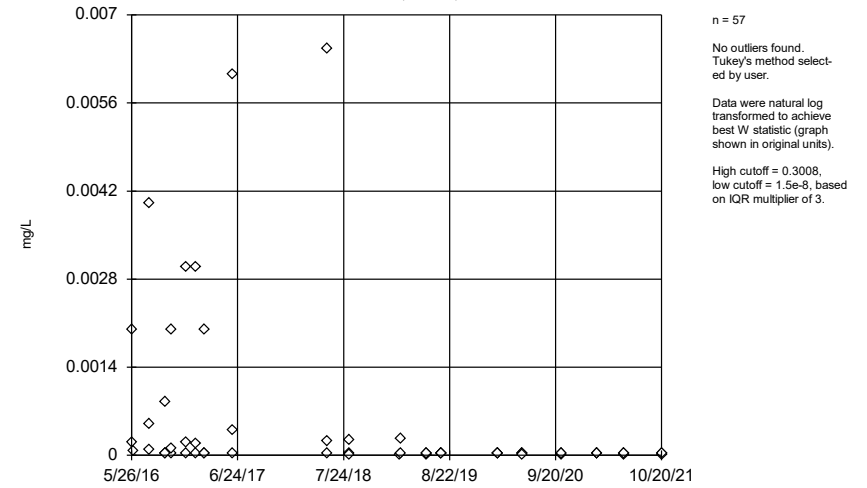
AD-1,AD-17,AD-5



Constituent: Boron, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

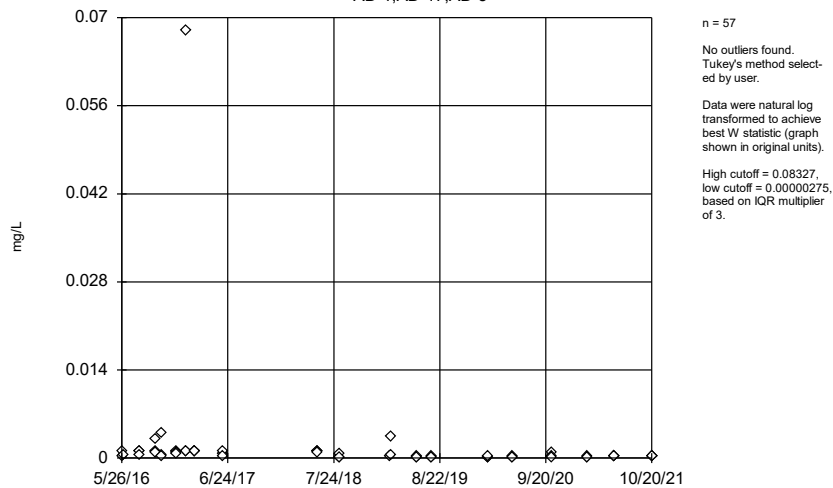
AD-1,AD-17,AD-5



Constituent: Cadmium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

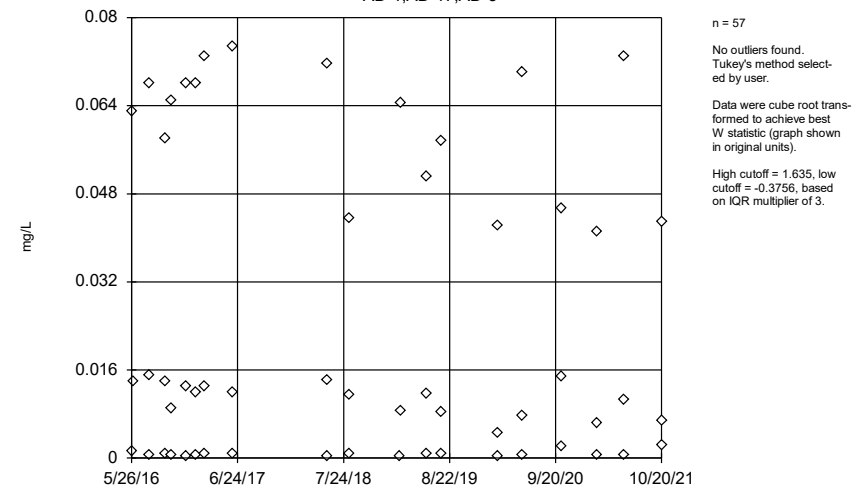
AD-1,AD-17,AD-5



Constituent: Chromium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

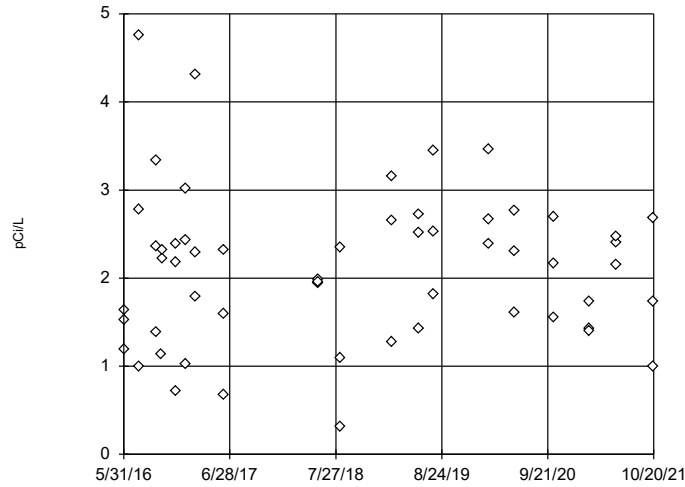
AD-1,AD-17,AD-5



Constituent: Cobalt, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

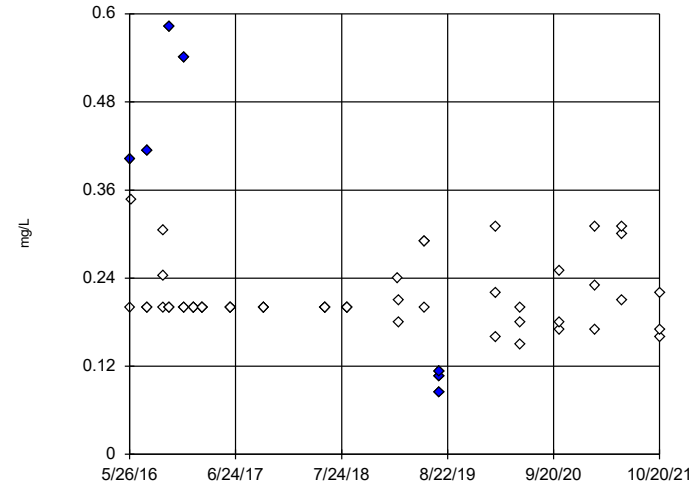


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 7.823, low cutoff = 0.0009145, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

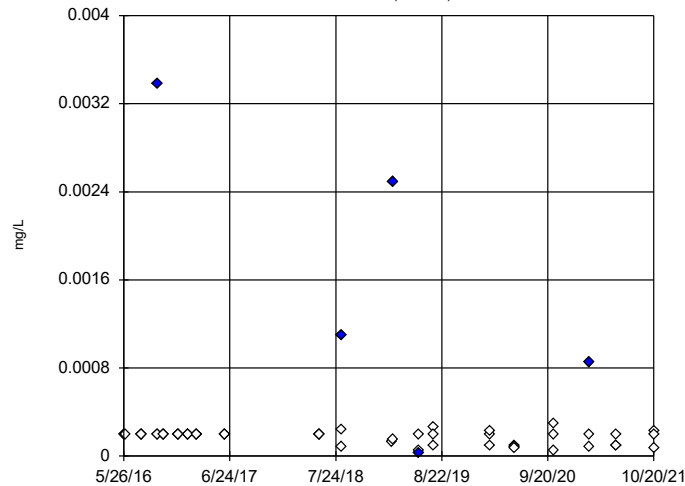


n = 60  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.3809, low cutoff = 0.1234, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

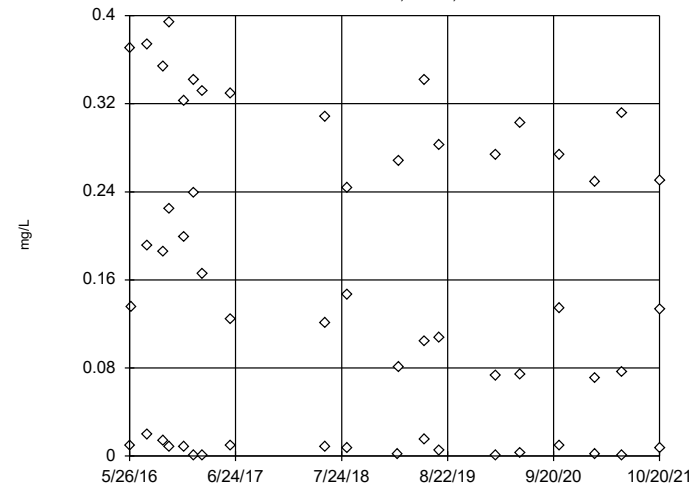


n = 57  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0006501, low cutoff = 0.00004153, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

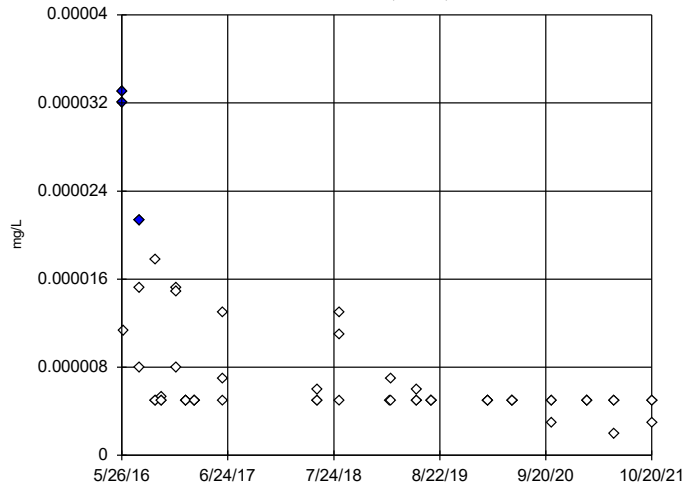


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 3.257, low cutoff = -1.406, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

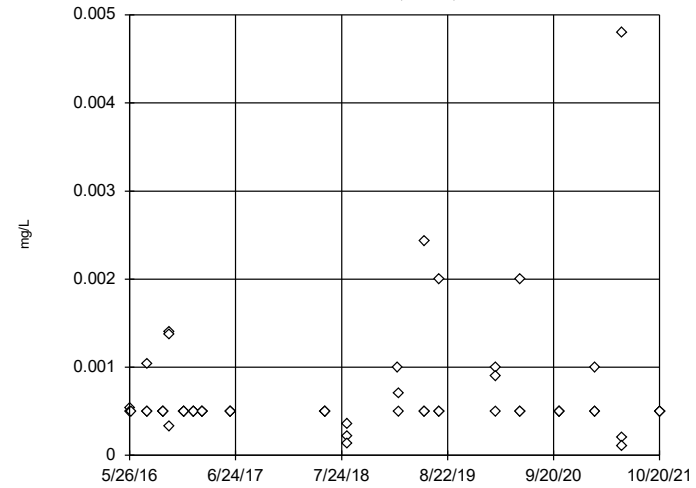


n = 57  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.00001921, low cutoff = 0.000001822, based on IQR multiplier of 3.

Constituent: Mercury, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

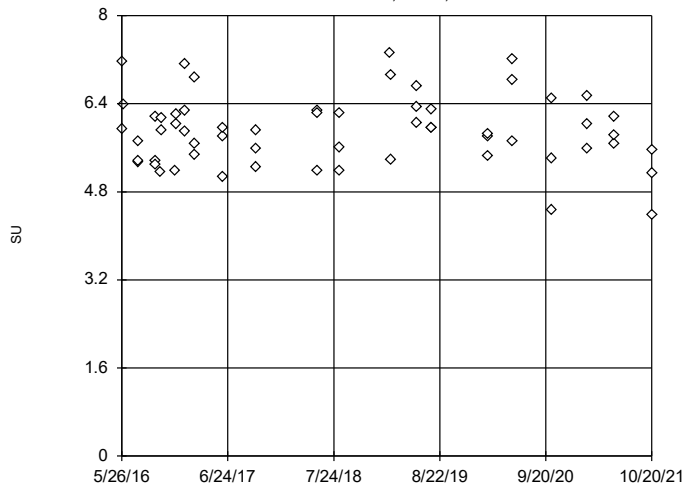


n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5

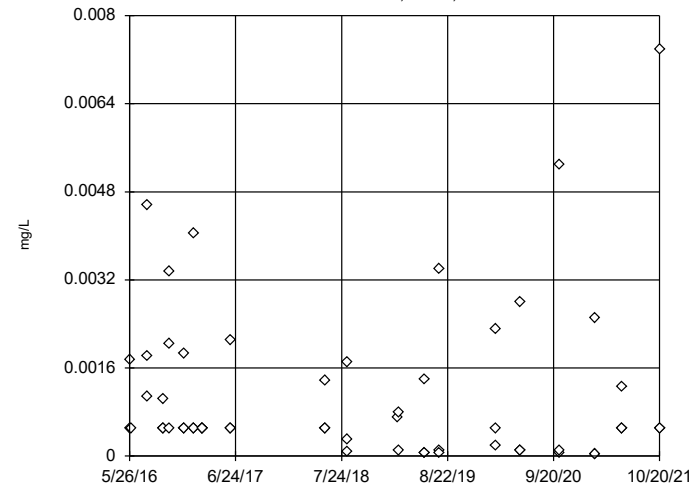


n = 60  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 9.056, low cutoff = 3.316, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5



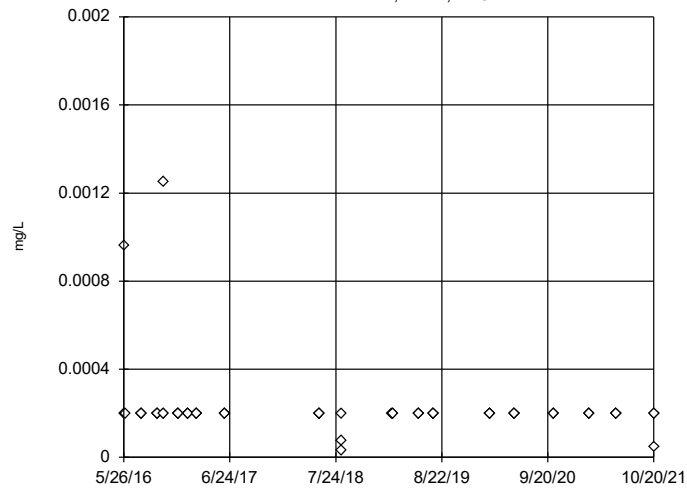
n = 57  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.1522, low cutoff = 0.000004388, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 2/1/2022 12:33 PM View: Outliers  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



### Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5



n = 57

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

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

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium, total Analysis Run 2/1/2022 12:33 PM View: Outliers

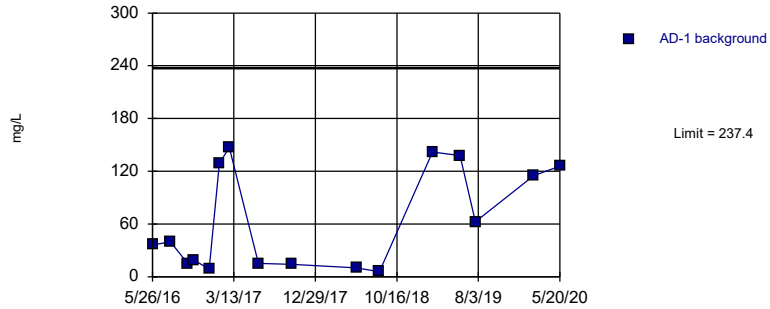
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

# Intrawell Prediction Limits

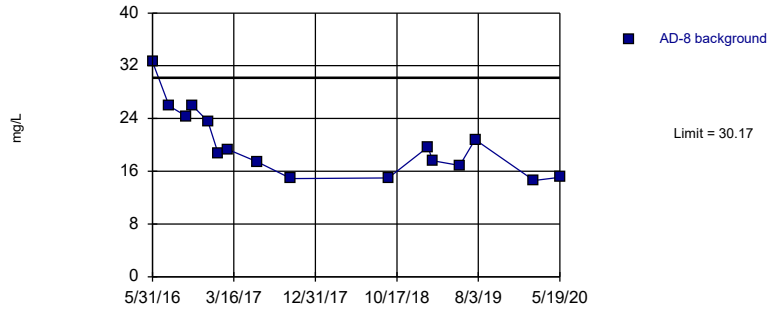
Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 1/14/2022, 8:55 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	AD-1	237.4	n/a	1 future	n/a	16	3.586	1.323	0	None	x^(1/3)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-15	4.972	n/a	1 future	n/a	15	3.508	0.7301	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-17	250	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-5	55.22	n/a	1 future	n/a	16	40.46	7.491	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-8	30.17	n/a	1 future	n/a	16	20.14	5.091	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-9	292.3	n/a	1 future	n/a	16	34784	25721	0	None	x^2	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-1	5.876	n/a	1 future	n/a	15	3.643	1.113	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-15	38.62	n/a	1 future	n/a	15	29.07	4.762	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-17	47.28	n/a	1 future	n/a	16	36.41	5.517	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-5	24.81	n/a	1 future	n/a	16	17.51	3.708	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-8	27.62	n/a	1 future	n/a	10	20.32	3.261	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-9	126.7	n/a	1 future	n/a	15	66.45	30.03	0	None	No	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-1	1	n/a	1 future	n/a	16	n/a	n/a	68.75	n/a	n/a	0.006456	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	AD-15	1	n/a	1 future	n/a	15	n/a	n/a	60	n/a	n/a	0.007533	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	AD-17	0.2	n/a	1 future	n/a	11	n/a	n/a	63.64	n/a	n/a	0.01276	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	AD-5	1	n/a	1 future	n/a	16	n/a	n/a	56.25	n/a	n/a	0.006456	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	AD-8	1.018	n/a	1 future	n/a	15	0.8085	0.09992	13.33	None	sqrt(x)	0.002505	Param Intra 1 of 2
Fluoride, total (mg/L)	AD-9	0.7664	n/a	1 future	n/a	15	0.5493	0.1627	40	Kaplan-Meier	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-1	67.66	n/a	1 future	n/a	16	47.39	10.29	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-15	32.52	n/a	1 future	n/a	15	18.61	6.934	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-17	1445	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Sulfate, total (mg/L)	AD-5	286.7	n/a	1 future	n/a	16	130.5	79.29	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-8	214.3	n/a	1 future	n/a	15	162.7	25.75	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-9	2367	n/a	1 future	n/a	15	1070	646.4	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-1	612	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Total Dissolved Solids (mg/L)	AD-15	281.5	n/a	1 future	n/a	14	172.1	53.59	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-17	1921	n/a	1 future	n/a	16	1689	118.1	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-5	505.2	n/a	1 future	n/a	16	332.6	87.61	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-8	514.3	n/a	1 future	n/a	15	379.1	67.41	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-9	2874	n/a	1 future	n/a	15	2.6e13	2.1e13	0	None	x^4	0.002505	Param Intra 1 of 2

Prediction Limit  
Intrawell Parametric, AD-1 (bg)



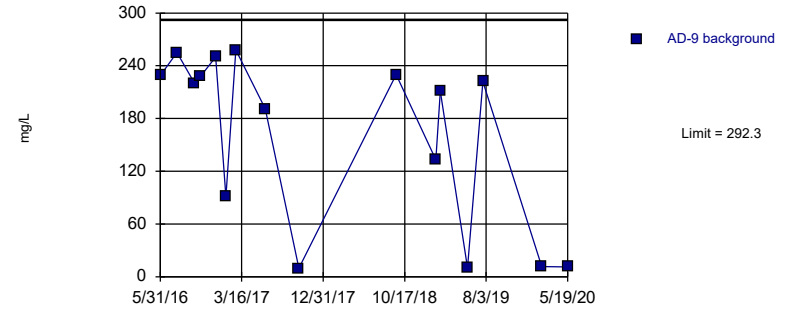
Prediction Limit  
Intrawell Parametric, AD-8



Background Data Summary: Mean=20.14, Std. Dev.=5.091, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8995, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

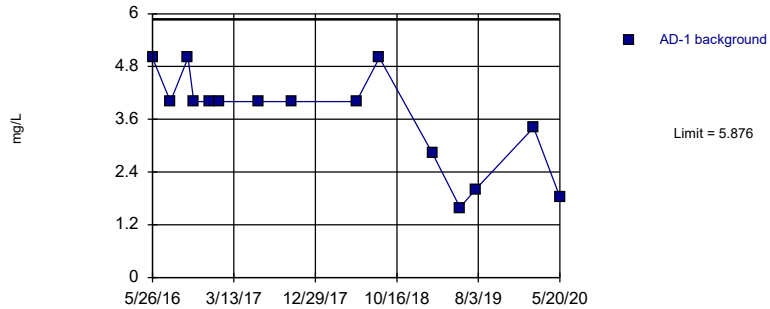
Prediction Limit  
Intrawell Parametric, AD-9



Background Data Summary (based on square transformation): Mean=34784, Std. Dev.=25721, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8454, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

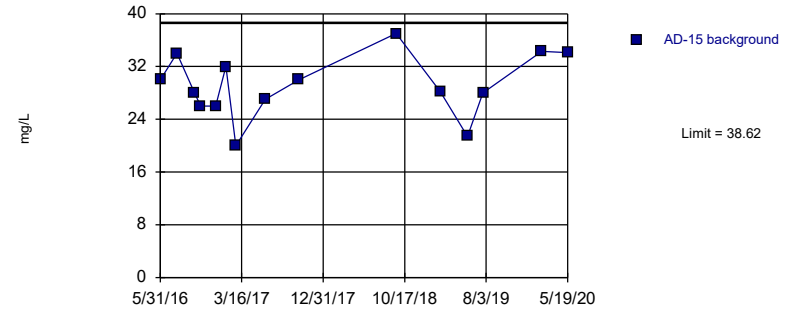
Prediction Limit  
Intrawell Parametric, AD-1 (bg)



Background Data Summary: Mean=3.643, Std. Dev.=1.113, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8562, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

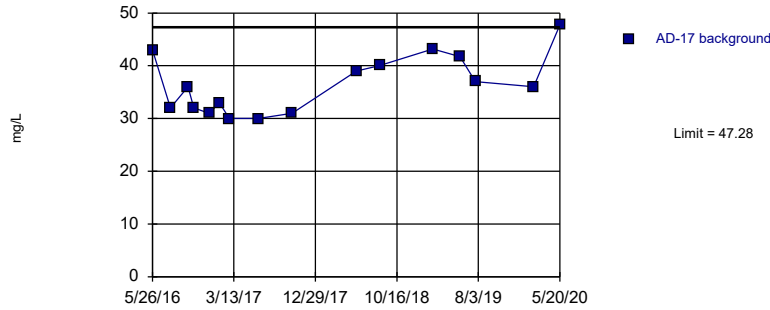
Prediction Limit  
Intrawell Parametric, AD-15



Background Data Summary: Mean=29.07, Std. Dev.=4.762, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9628, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

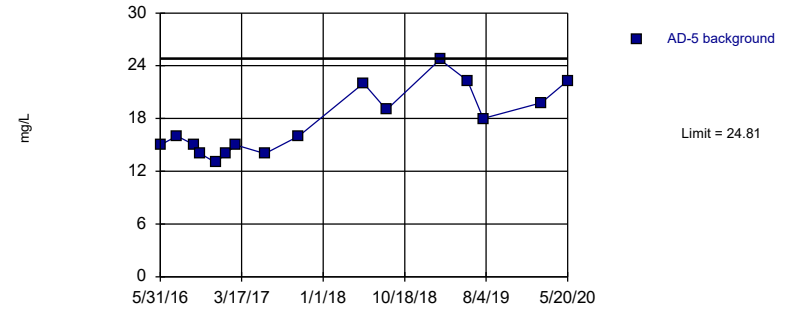
Prediction Limit  
Intrawell Parametric, AD-17 (bg)



Background Data Summary: Mean=36.41, Std. Dev.=5.517, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9197, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

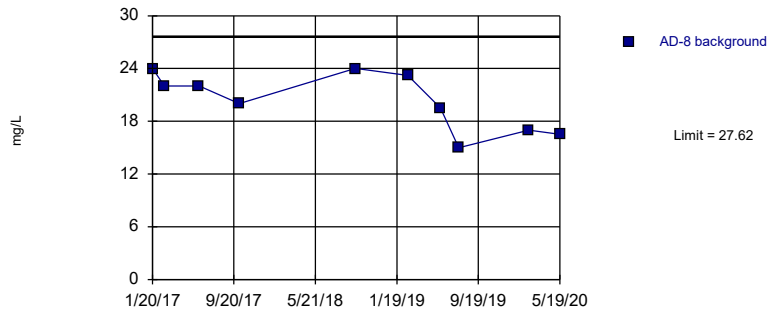
Prediction Limit  
Intrawell Parametric, AD-5 (bg)



Background Data Summary: Mean=17.51, Std. Dev.=3.708, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8923, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

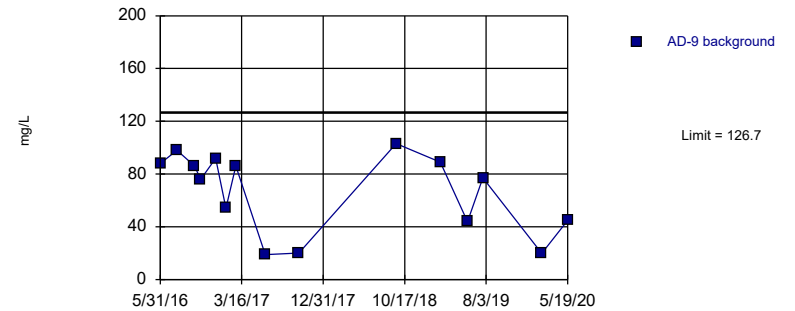
Prediction Limit  
Intrawell Parametric, AD-8



Background Data Summary: Mean=20.32, Std. Dev.=3.261, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9127, critical = 0.781. Kappa = 2.238 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

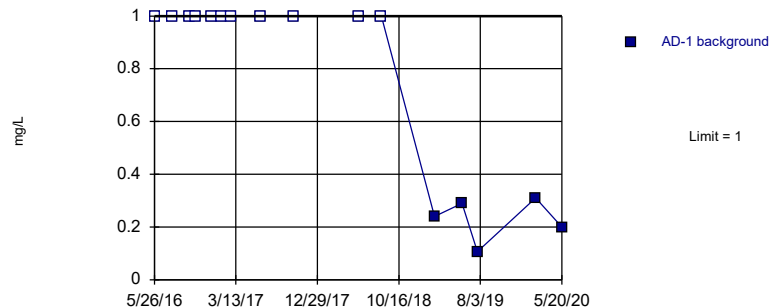
Prediction Limit  
Intrawell Parametric, AD-9



Background Data Summary: Mean=66.45, Std. Dev.=30.03, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8663, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

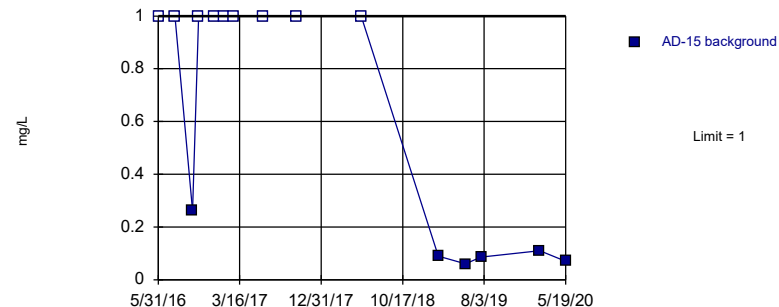
Prediction Limit  
Intrawell Non-parametric, AD-1 (bg)



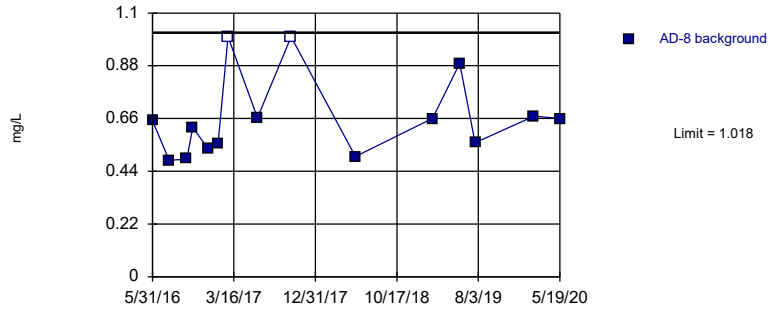
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 68.75% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Prediction Limit  
Intrawell Non-parametric, AD-15



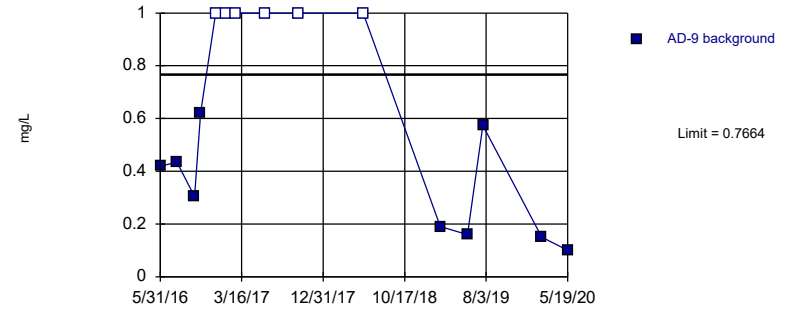
Prediction Limit  
Intrawell Parametric, AD-8



Background Data Summary (based on square root transformation): Mean=0.8085, Std. Dev.=0.09992, n=15, 13.33% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8572, critical = 0.835. 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 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

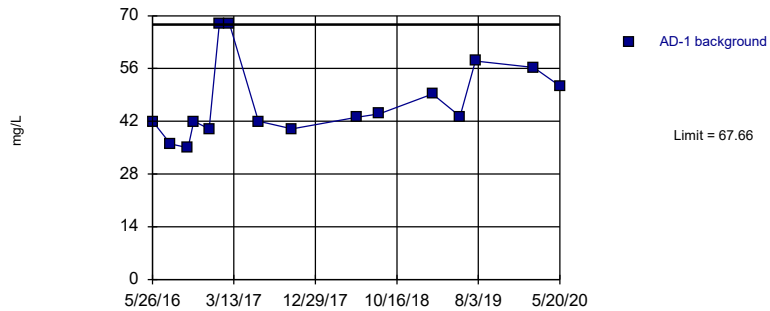
Prediction Limit  
Intrawell Parametric, AD-9



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.5493, Std. Dev.=0.1627, n=15, 40% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8499, critical = 0.835. 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 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

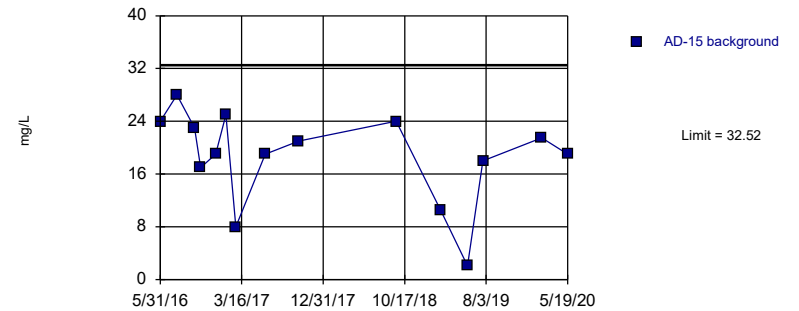
Prediction Limit  
Intrawell Parametric, AD-1 (bg)



Background Data Summary: Mean=47.39, Std. Dev.=10.29, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8677, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

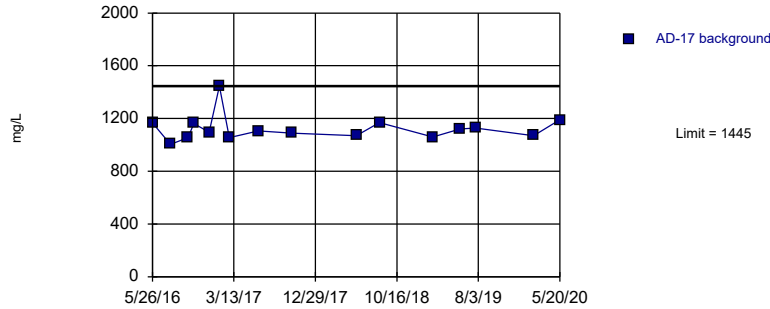
Prediction Limit  
Intrawell Parametric, AD-15



Background Data Summary: Mean=18.61, Std. Dev.=6.934, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8989, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

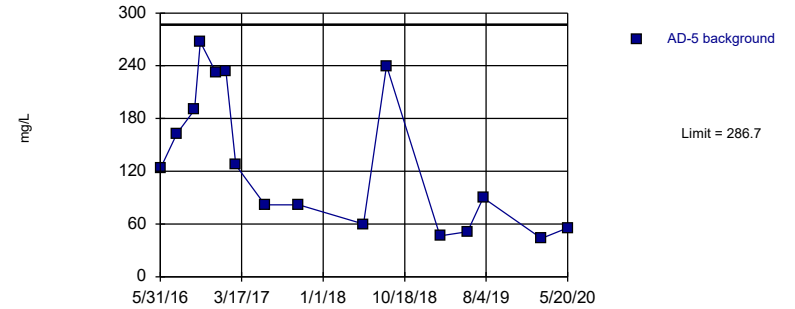
Prediction Limit  
Intrawell Non-parametric, AD-17 (bg)



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 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

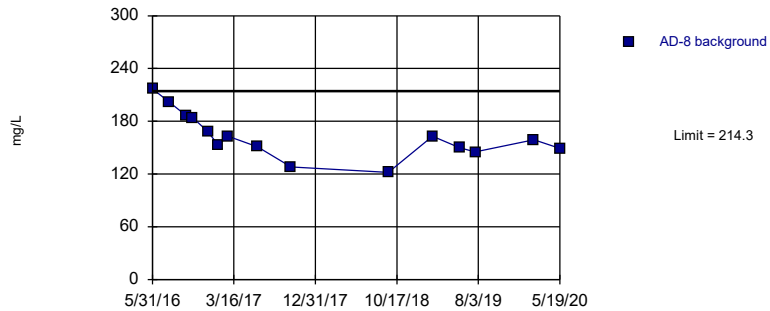
Prediction Limit  
Intrawell Parametric, AD-5 (bg)



Background Data Summary: Mean=130.5, Std. Dev.=79.29, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8753, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

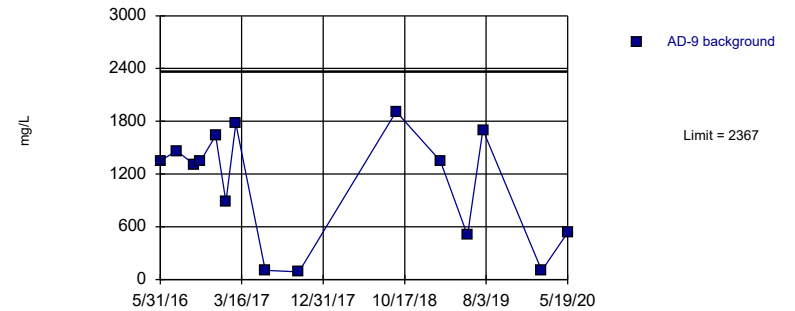
Prediction Limit  
Intrawell Parametric, AD-8



Background Data Summary: Mean=162.7, Std. Dev.=25.75, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.954, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Prediction Limit  
Intrawell Parametric, AD-9

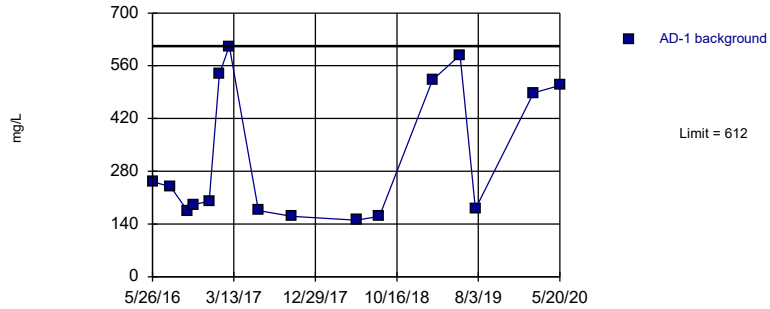


Background Data Summary: Mean=1070, Std. Dev.=646.4, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8834, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP



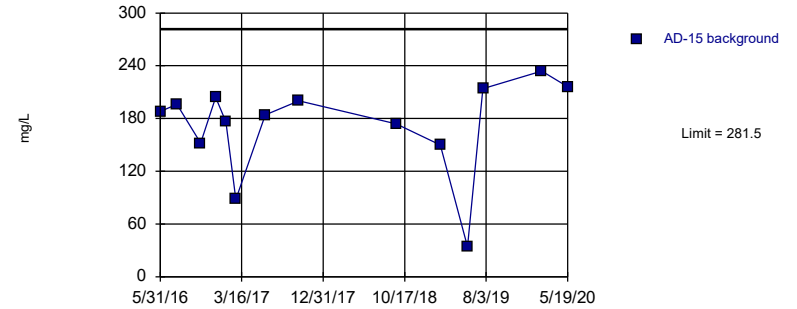
Prediction Limit  
Intrawell Non-parametric, AD-1 (bg)



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 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

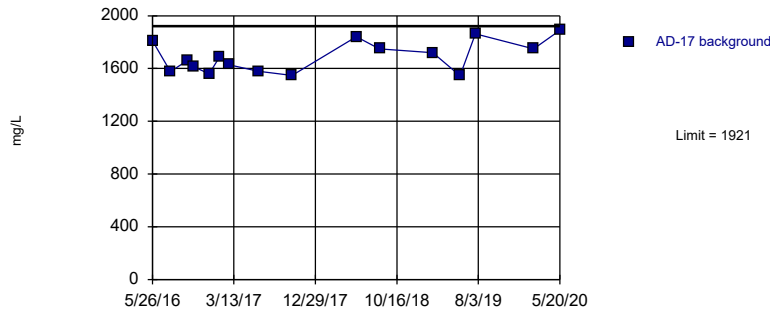
Prediction Limit  
Intrawell Parametric, AD-15



Background Data Summary: Mean=172.1, Std. Dev.=53.59, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8428, critical = 0.825. Kappa = 2.041 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

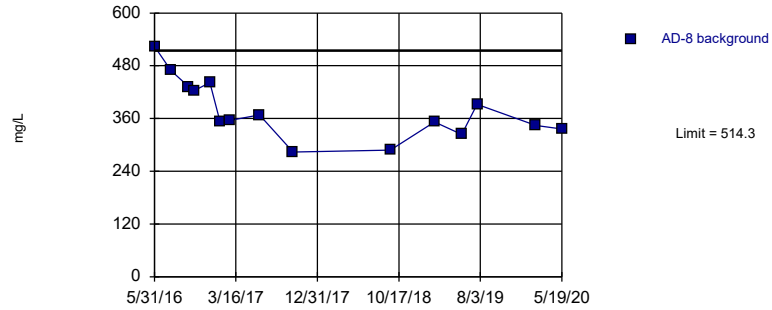
Constituent: Total Dissolved Solids Analysis Run 1/14/2022 8:53 AM View: All Intrawell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Prediction Limit  
Intrawell Parametric, AD-17 (bg)



Background Data Summary: Mean=1689, Std. Dev.=118.1, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9189, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.0

Prediction Limit  
Intrawell Parametric, AD-8



# Trend Test - Significant Results

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 1/10/2022, 10:29 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron, total (mg/L)	AD-1 (bg)	0.07302	106	81	Yes	20	0	n/a	n/a	0.01	NP
pH, field (SU)	AD-17 (bg)	-0.1299	-86	-81	Yes	20	0	n/a	n/a	0.01	NP

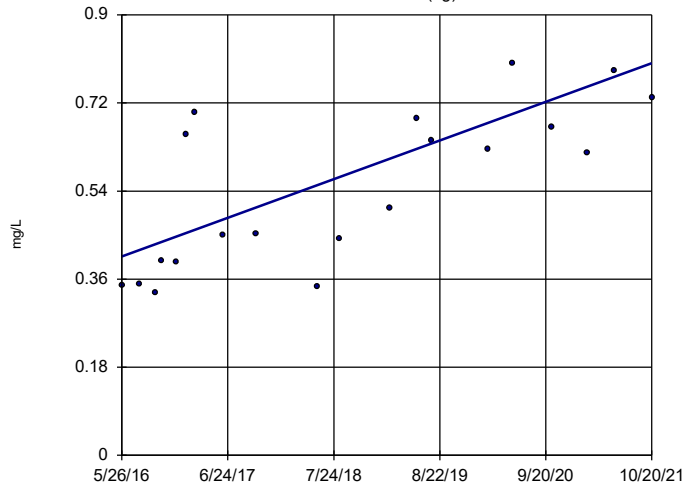
# Trend Test - All Results

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 1/10/2022, 10:29 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
<b>Boron, total (mg/L)</b>	<b>AD-1 (bg)</b>	<b>0.07302</b>	<b>106</b>	<b>81</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Boron, total (mg/L)	AD-17 (bg)	-0.002795	-38	-81	No	20	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	AD-5 (bg)	-0.002298	-58	-81	No	20	0	n/a	n/a	0.01	NP
pH, field (SU)	AD-1 (bg)	0.003456	1	81	No	20	0	n/a	n/a	0.01	NP
<b>pH, field (SU)</b>	<b>AD-17 (bg)</b>	<b>-0.1299</b>	<b>-86</b>	<b>-81</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
pH, field (SU)	AD-5 (bg)	0.04563	28	81	No	20	0	n/a	n/a	0.01	NP

### Sen's Slope Estimator

AD-1 (bg)

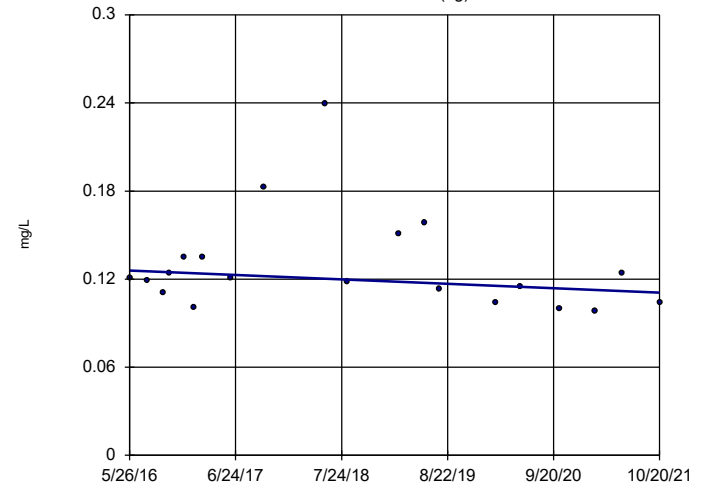


n = 20  
 Slope = 0.07302  
 units per year.  
 Mann-Kendall  
 statistic = 106  
 critical = 81  
 Increasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Boron, total Analysis Run 1/10/2022 10:28 AM View: All Interwell  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Sen's Slope Estimator

AD-17 (bg)

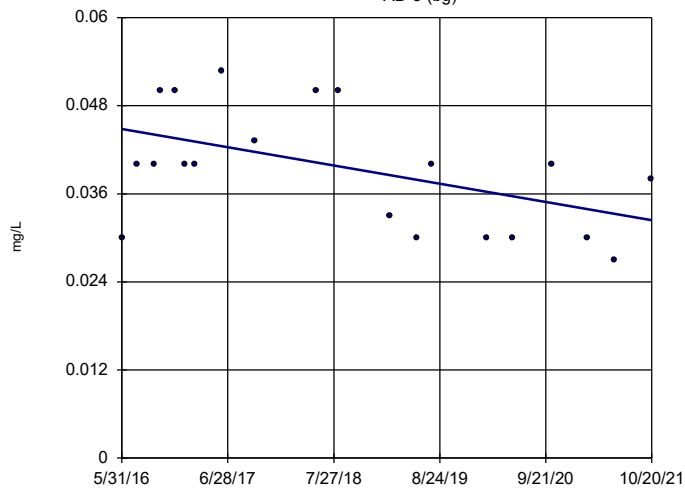


n = 20  
 Slope = -0.002795  
 units per year.  
 Mann-Kendall  
 statistic = -38  
 critical = -81  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Boron, total Analysis Run 1/10/2022 10:28 AM View: All Interwell  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Sen's Slope Estimator

AD-5 (bg)

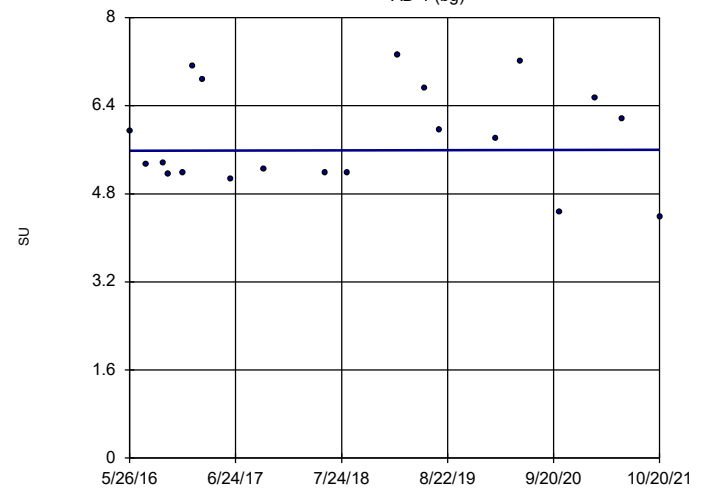


n = 20  
 Slope = -0.002298  
 units per year.  
 Mann-Kendall  
 statistic = -58  
 critical = -81  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Boron, total Analysis Run 1/10/2022 10:28 AM View: All Interwell  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Sen's Slope Estimator

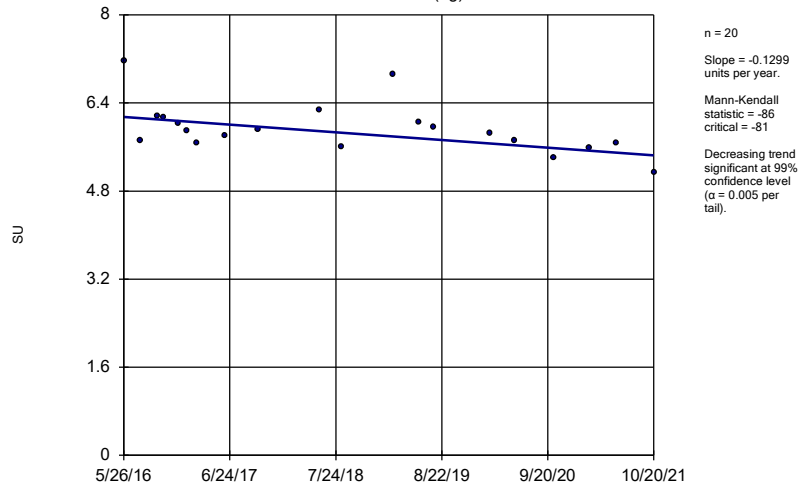
AD-1 (bg)



n = 20  
 Slope = 0.003456  
 units per year.  
 Mann-Kendall  
 statistic = 1  
 critical = 81  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

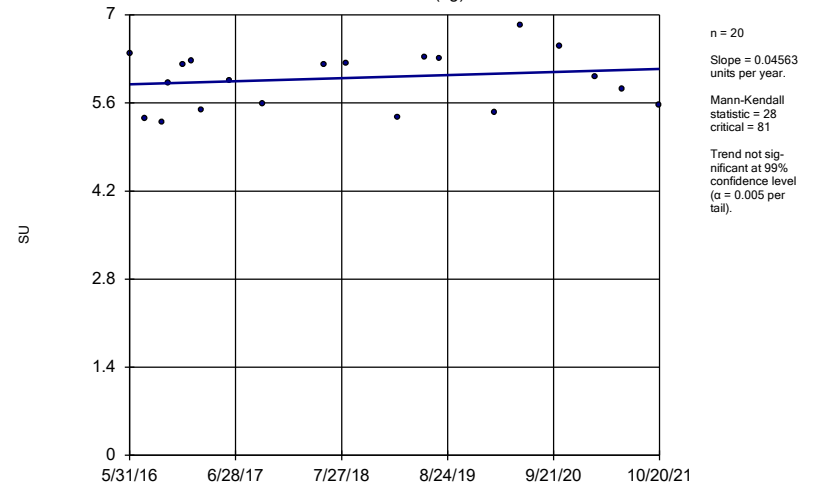
Constituent: pH, field Analysis Run 1/10/2022 10:28 AM View: All Interwell  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Sen's Slope Estimator AD-17 (bg)



Constituent: pH, field Analysis Run 1/10/2022 10:28 AM View: All Interwell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Sen's Slope Estimator AD-5 (bg)



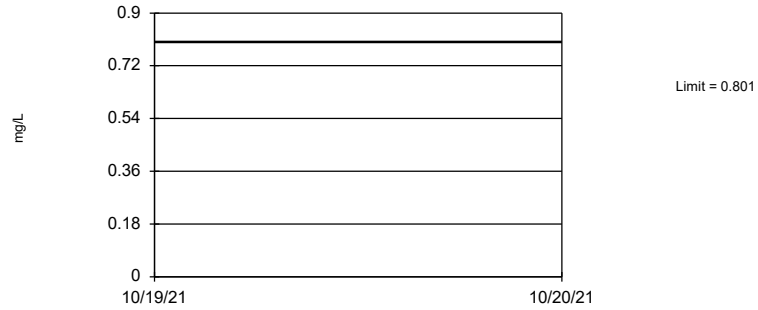
Constituent: pH, field Analysis Run 1/10/2022 10:28 AM View: All Interwell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

# Interwell Prediction Limits

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 1/10/2022, 10:27 AM

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)	n/a	0.801	n/a	n/a	3 future	n/a	60	n/a	n/a	n/a	0	n/a	n/a	0.0005253	NP Inter (normality) 1 of 2
pH, field (SU)	n/a	6.979	4.824	n/a	3 future	n/a	60	5.902	0.6318	0	None	No	0.001253	Param Inter 1 of 2	

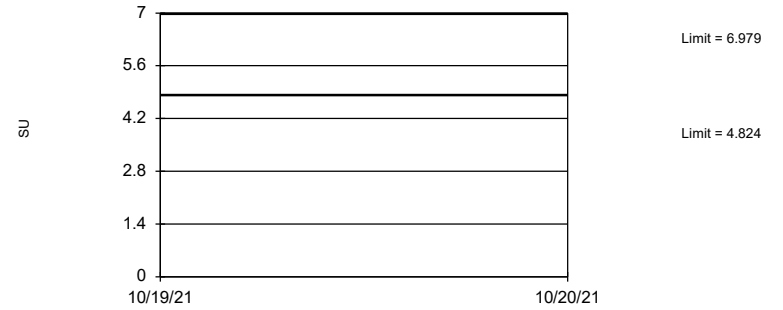
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 60 background values. Annual per-constituent alpha = 0.003148. Individual comparison alpha = 0.0005253 (1 of 2). Assumes 3 future values.

Constituent: Boron, total Analysis Run 1/10/2022 10:26 AM View: All Interwell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=5.902, Std. Dev.=0.6318, n=60. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9783, critical = 0.945. Kappa = 1.706 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001253. Assumes 3 future values.

Constituent: pH, field Analysis Run 1/10/2022 10:26 AM View: All Interwell  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

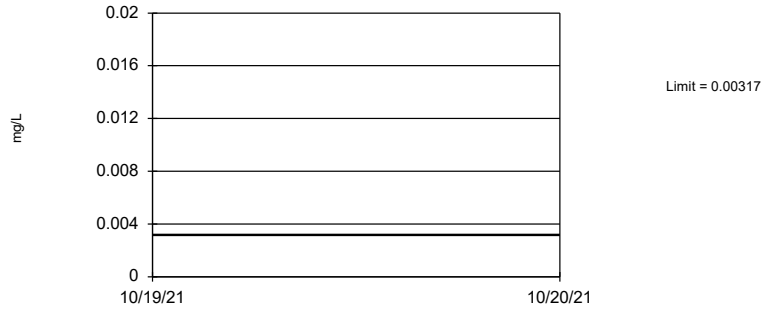


# Upper Tolerance Limits

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 9:42 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00317	n/a	n/a	n/a	57	n/a	n/a	70.18	n/a	n/a	0.05373	NP Inter(NDs)
Arsenic, total (mg/L)	n/a	0.00628	n/a	n/a	n/a	57	n/a	n/a	33.33	n/a	n/a	0.05373	NP Inter(normality)
Barium, total (mg/L)	n/a	0.6299	n/a	n/a	n/a	57	-2.819	1.162	0	None	ln(x)	0.05	Inter
Beryllium, total (mg/L)	n/a	0.0007622	n/a	n/a	n/a	57	0.05309	0.01886	7.018	None	x^(1/3)	0.05	Inter
Cadmium, total (mg/L)	n/a	0.004	n/a	n/a	n/a	55	n/a	n/a	32.73	n/a	n/a	0.05954	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.00235	n/a	n/a	n/a	56	-8.217	1.064	16.07	Kaplan-Meier	ln(x)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.0748	n/a	n/a	n/a	57	n/a	n/a	0	n/a	n/a	0.05373	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	n/a	3.838	n/a	n/a	n/a	57	2.108	0.8532	0	None	No	0.05	Inter
Fluoride, total (mg/L)	n/a	0.583	n/a	n/a	n/a	60	n/a	n/a	45	n/a	n/a	0.04607	NP Inter(normality)
Lead, total (mg/L)	n/a	0.003384	n/a	n/a	n/a	57	n/a	n/a	54.39	n/a	n/a	0.05373	NP Inter(NDs)
Lithium, total (mg/L)	n/a	0.394	n/a	n/a	n/a	57	n/a	n/a	1.754	n/a	n/a	0.05373	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000033	n/a	n/a	n/a	57	n/a	n/a	63.16	n/a	n/a	0.05373	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.00243	n/a	n/a	n/a	56	n/a	n/a	67.86	n/a	n/a	0.05656	NP Inter(NDs)
Selenium, total (mg/L)	n/a	0.016	n/a	n/a	n/a	57	-7.827	1.82	36.84	Kaplan-Meier	ln(x)	0.05	Inter
Thallium, total (mg/L)	n/a	0.001251	n/a	n/a	n/a	57	n/a	n/a	91.23	n/a	n/a	0.05373	NP Inter(NDs)

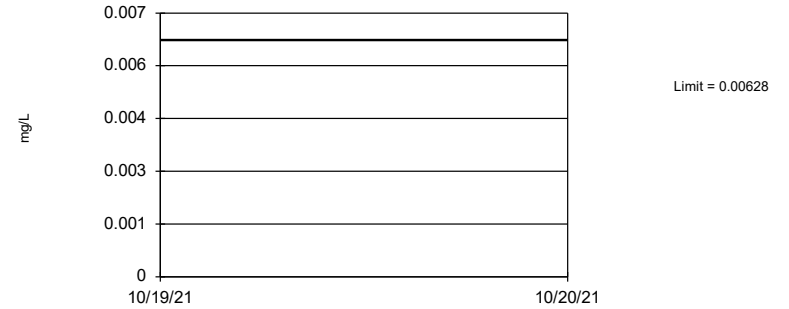
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 70.18% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Antimony, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

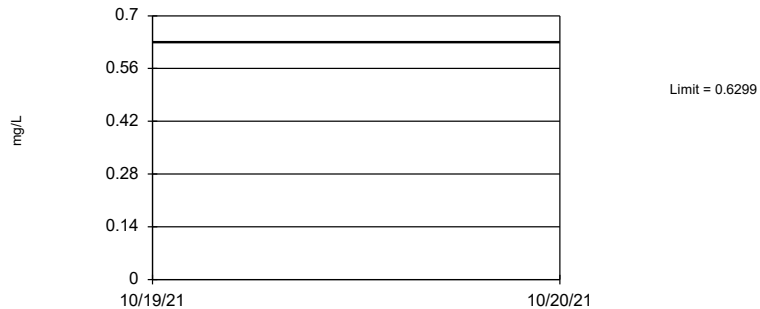
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 33.33% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Arsenic, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

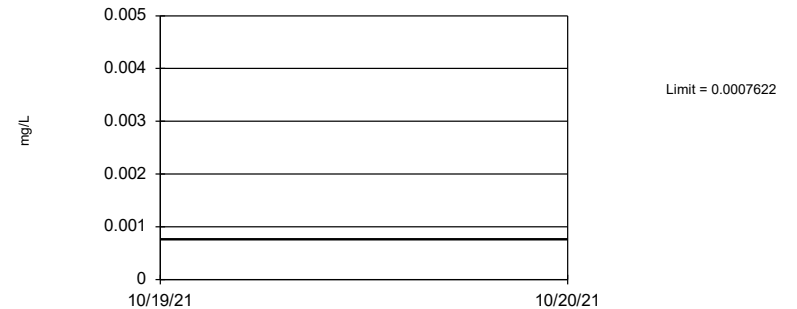
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-2.819, Std. Dev.=1.162, n=57. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9595, critical = 0.944. Report alpha = 0.05.

Constituent: Barium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

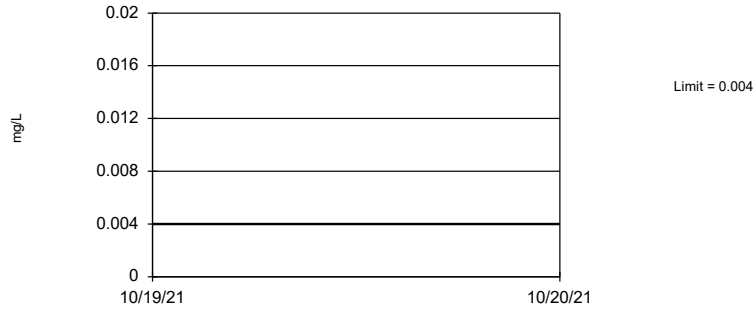
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.05309, Std. Dev.=0.01886, n=57, 7.018% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.946, critical = 0.944. Report alpha = 0.05.

Constituent: Beryllium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

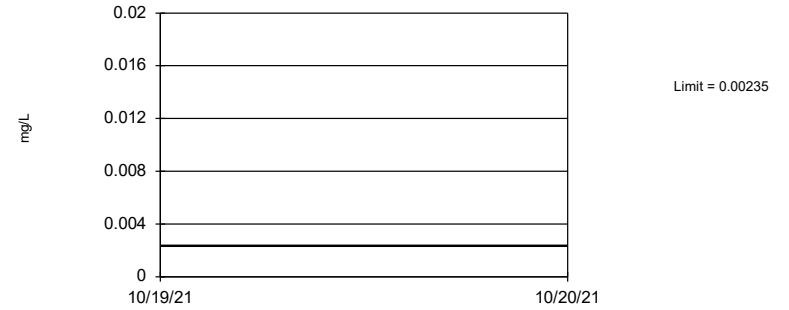
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 55 background values. 32.73% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05954.

Constituent: Cadmium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

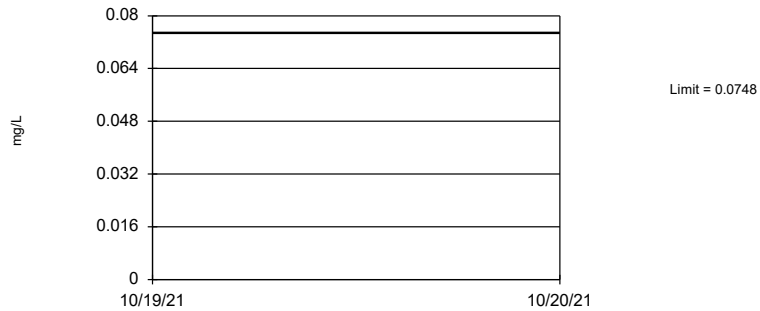
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-8.217, Std. Dev.=1.064, n=56, 16.07% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9539, critical = 0.942. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

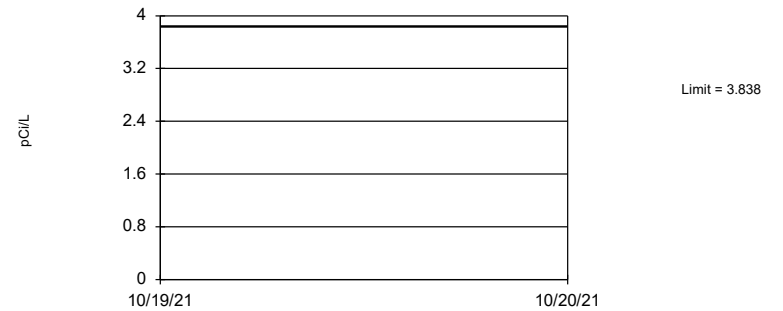
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Cobalt, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

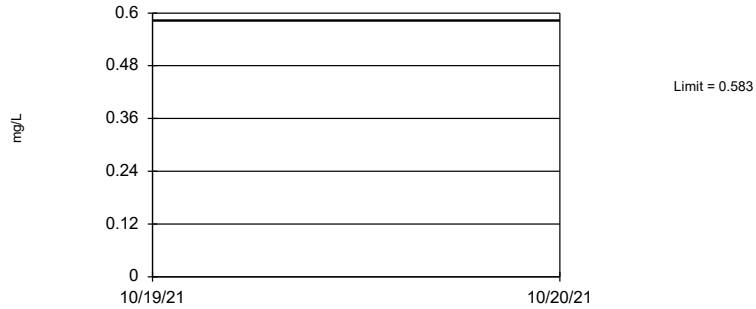
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=2.108, Std. Dev.=0.8532, n=57. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9636, critical = 0.944. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

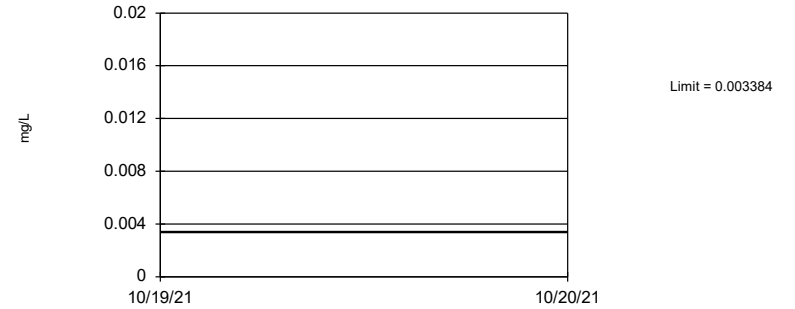
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 60 background values. 45% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04607.

Constituent: Fluoride, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

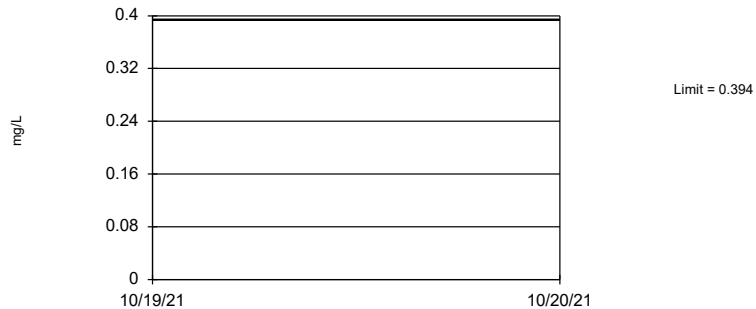
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 54.39% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Lead, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

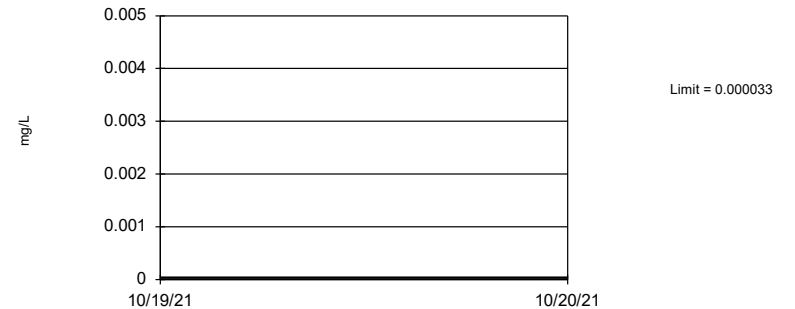
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 1.754% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Lithium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

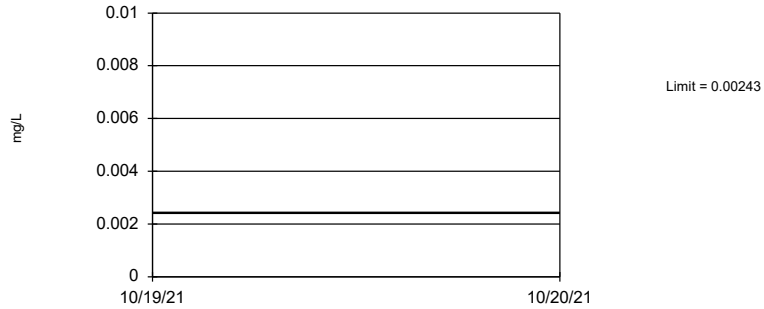
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 63.16% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Mercury, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 67.86% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Molybdenum, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

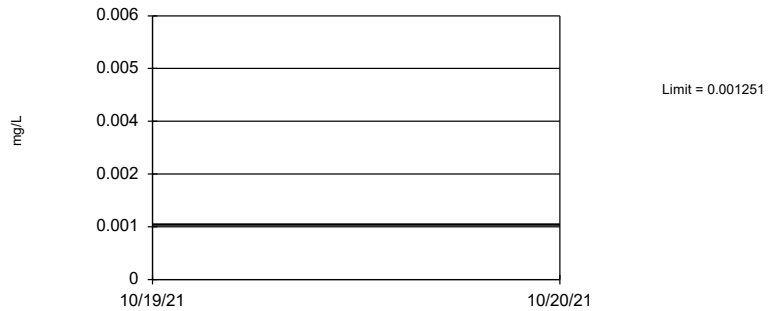
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-7.827, Std. Dev.=1.82, n=57, 36.84% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9462, critical = 0.944. Report alpha = 0.05.

Constituent: Selenium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 91.23% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Thallium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

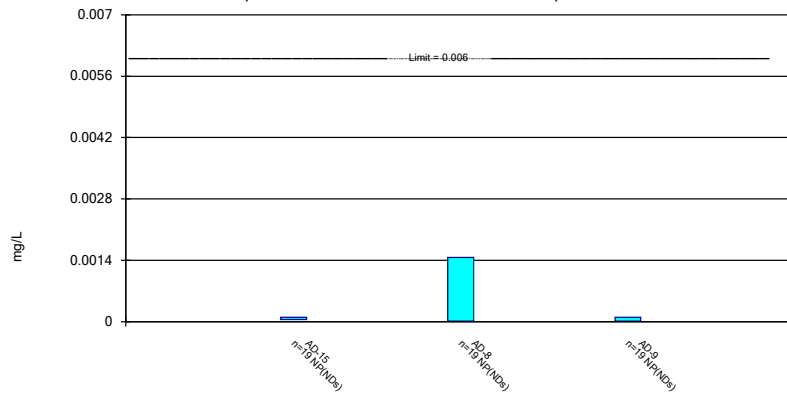
# Confidence Intervals - All Results (No Significant)

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 9:51 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-15	0.0001	0.00005	0.006	No 19	0.00008158	0.00003096	68.42	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-8	0.001461	0.00001	0.006	No 19	0.0003295	0.0007604	84.21	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-9	0.0001	0.00001	0.006	No 19	0.00009526	0.00002065	94.74	None	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-15	0.008637	0.003174	0.01	No 18	0.006707	0.006073	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	AD-8	0.005	0.00031	0.01	No 19	0.002356	0.002323	42.11	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-9	0.005	0.00027	0.01	No 19	0.002712	0.002265	47.37	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-15	0.203	0.0769	2	No 18	0.1495	0.0975	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-8	0.0295	0.02203	2	No 19	0.02632	0.007452	0	None	ln(x)	0.01	Param.
Barium, total (mg/L)	AD-9	0.05126	0.03281	2	No 19	0.04398	0.01772	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	AD-15	0.0008144	0.0001993	0.004	No 18	0.000589	0.0006306	0	None	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	AD-8	0.0001145	0.00003	0.004	No 19	0.00008752	0.00004009	68.42	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	AD-9	0.001113	0.000561	0.004	No 19	0.0008371	0.0004716	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-15	0.0003515	0.00001	0.005	No 18	0.0001894	0.0002695	5.556	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-8	0.001	0.000021	0.005	No 19	0.0004895	0.0004977	47.37	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-9	0.0009815	0.0002373	0.005	No 19	0.000776	0.0008579	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	AD-15	0.01172	0.001058	0.1	No 18	0.01015	0.01602	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	AD-8	0.0005027	0.0001362	0.1	No 19	0.0005649	0.0005077	26.32	Kaplan-Meier	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	AD-9	0.001	0.000346	0.1	No 19	0.0006695	0.0003106	42.11	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-15	0.008124	0.003773	0.075	No 18	0.006842	0.005229	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	AD-8	0.00627	0.003347	0.075	No 19	0.004808	0.002496	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-9	0.02397	0.01621	0.075	No 19	0.02042	0.007099	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-15	2.557	1.51	5	No 18	2.034	0.8649	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-8	1.328	0.5192	5	No 19	1.204	1.424	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-9	2.446	1.743	5	No 19	2.095	0.6007	0	None	No	0.01	Param.
Fluoride, total (mg/L)	AD-15	1	0.086	4	No 19	0.5288	0.461	47.37	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-8	0.7809	0.5913	4	No 19	0.6919	0.1665	10.53	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-9	1	0.19	4	No 19	0.5123	0.3677	31.58	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-15	0.003606	0.0003128	0.0034	No 18	0.004285	0.006531	16.67	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	AD-8	0.0002	0.00007	0.0034	No 19	0.0001527	0.00006725	57.89	Kaplan-Meier	No	0.01	NP (NDs)
Lead, total (mg/L)	AD-9	0.0002	0.00008	0.0034	No 19	0.0001743	0.00007305	47.37	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-15	0.01546	0.004345	0.39	No 19	0.01727	0.03316	0	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	AD-8	0.1056	0.07943	0.39	No 19	0.09251	0.02234	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-9	1.33	0.189	0.39	No 19	0.804	0.52	0	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-15	0.00002939	0.000006165	0.002	No 17	0.00002634	0.00002937	35.29	Kaplan-Meier	ln(x)	0.01	Param.
Mercury, total (mg/L)	AD-8	0.000008	0.000005	0.002	No 18	0.000006538	0.000003925	77.78	Kaplan-Meier	No	0.01	NP (NDs)
Mercury, total (mg/L)	AD-9	0.00001	0.000003	0.002	No 18	0.000008788	0.00001051	27.78	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	AD-15	0.001546	0.0004635	0.0024	No 19	0.0009616	0.000981	57.89	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-8	0.0008389	0.00016	0.0024	No 19	0.0005787	0.0002731	78.95	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-9	0.0005	0.00011	0.0024	No 19	0.0004795	0.00008947	94.74	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-15	0.001857	0.0006319	0.05	No 18	0.001372	0.001257	11.11	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	AD-8	0.00137	0.00008	0.05	No 19	0.0005328	0.0005624	47.37	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-9	0.00106	0.0003	0.05	No 19	0.001156	0.001899	21.05	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-15	0.00137	0.0001	0.002	No 19	0.000491	0.0003918	63.16	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-8	0.001185	0.00011	0.002	No 19	0.0004693	0.0003895	57.89	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-9	0.0003362	0.00008834	0.002	No 18	0.0004634	0.0004514	38.89	Kaplan-Meier	ln(x)	0.01	Param.

### Non-Parametric Confidence Interval

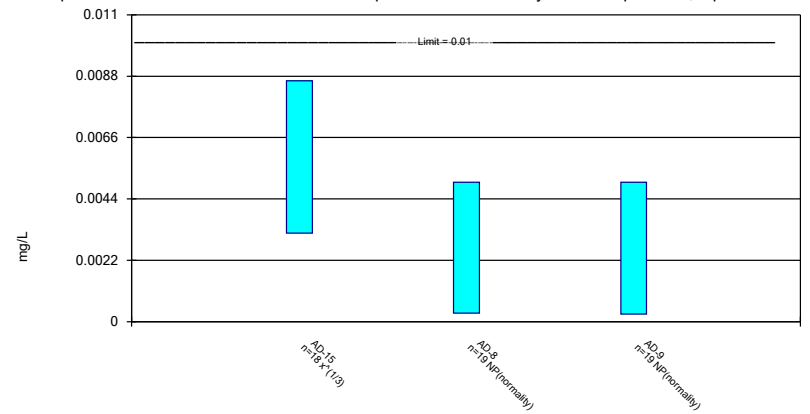
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

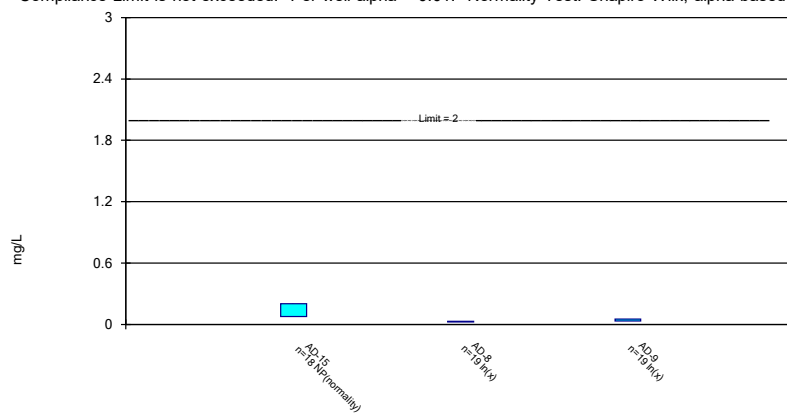
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

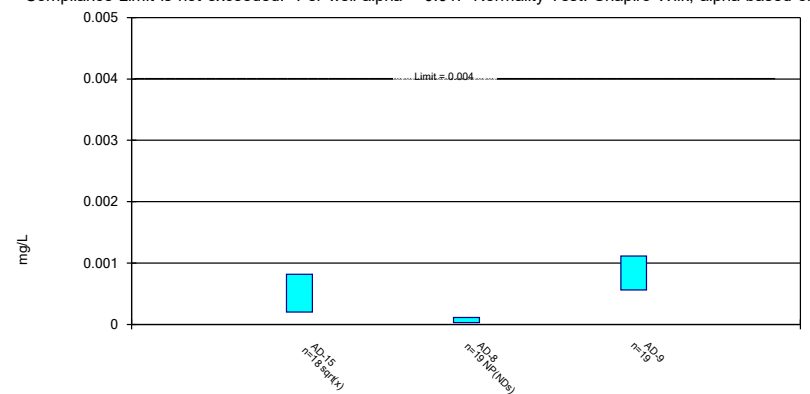
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

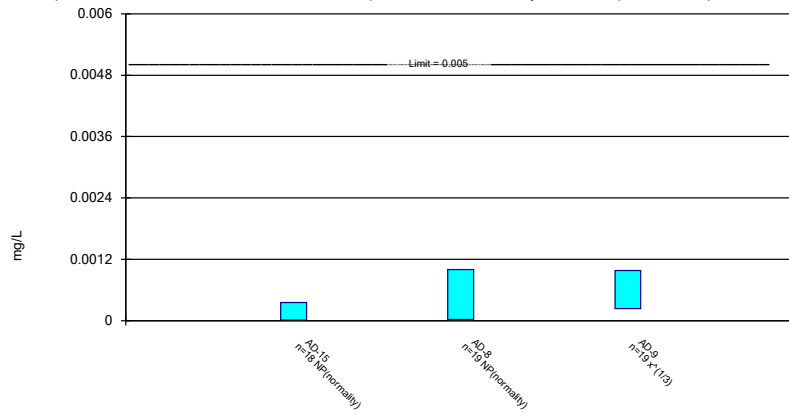
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric and Non-Parametric (NP) Confidence Interval

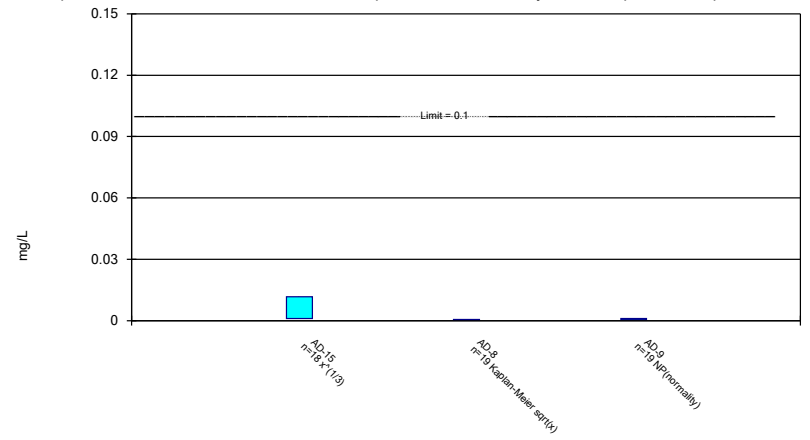
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric and Non-Parametric (NP) Confidence Interval

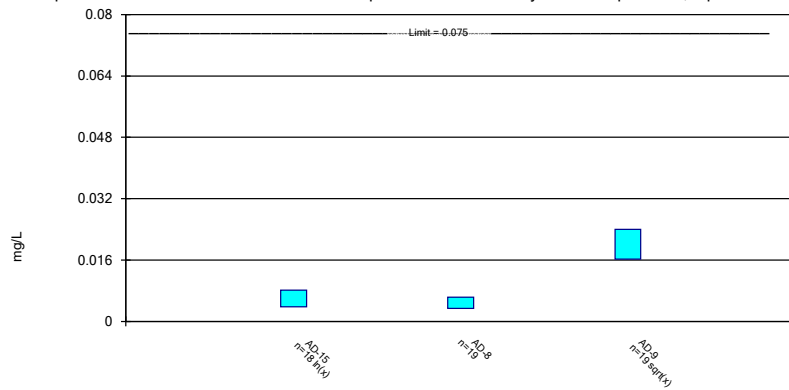
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric Confidence Interval

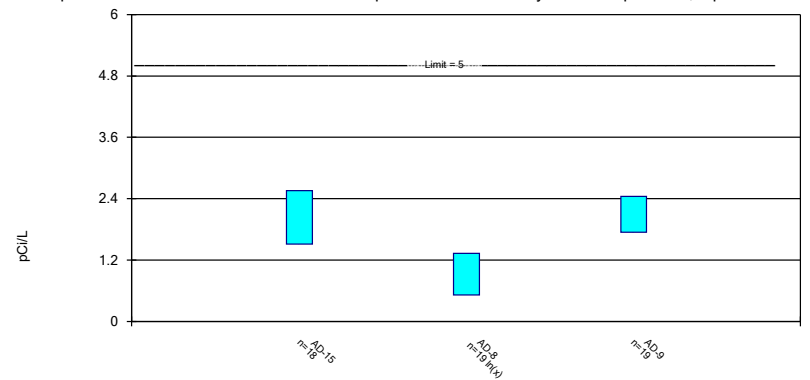
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric Confidence Interval

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

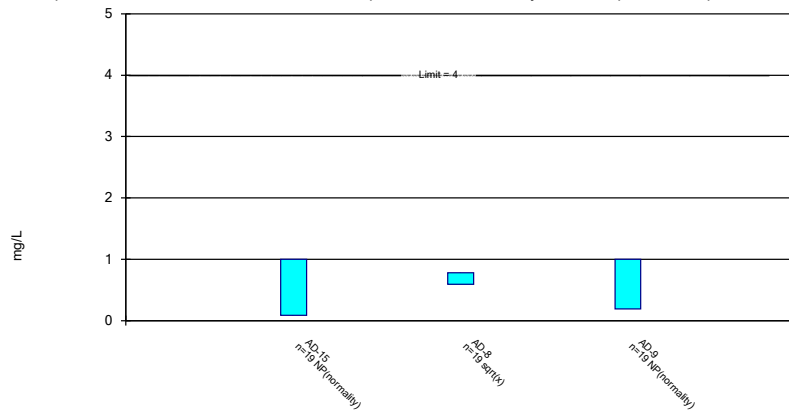


Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



Parametric and Non-Parametric (NP) Confidence Interval

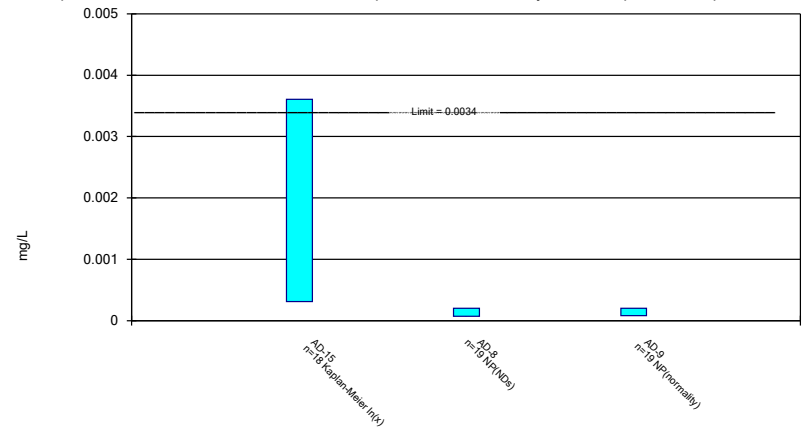
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric and Non-Parametric (NP) Confidence Interval

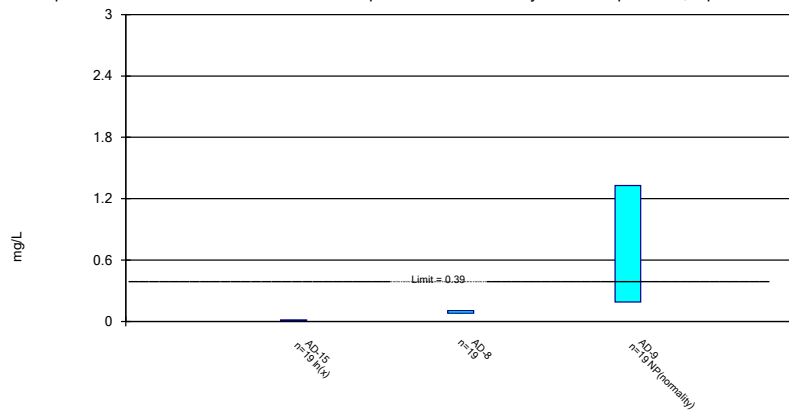
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric and Non-Parametric (NP) Confidence Interval

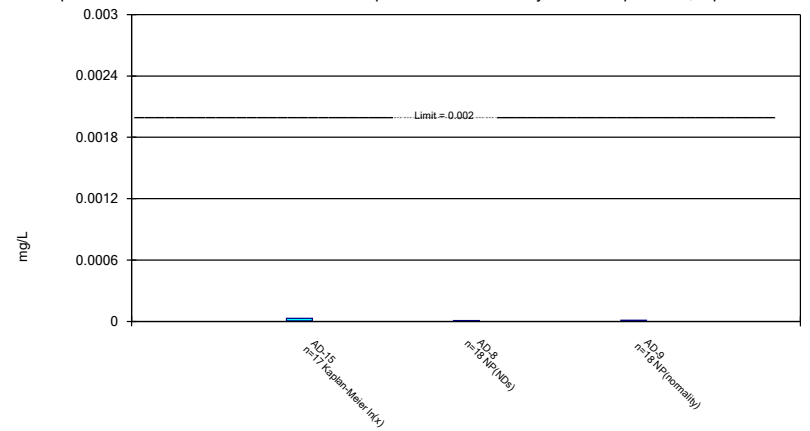
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



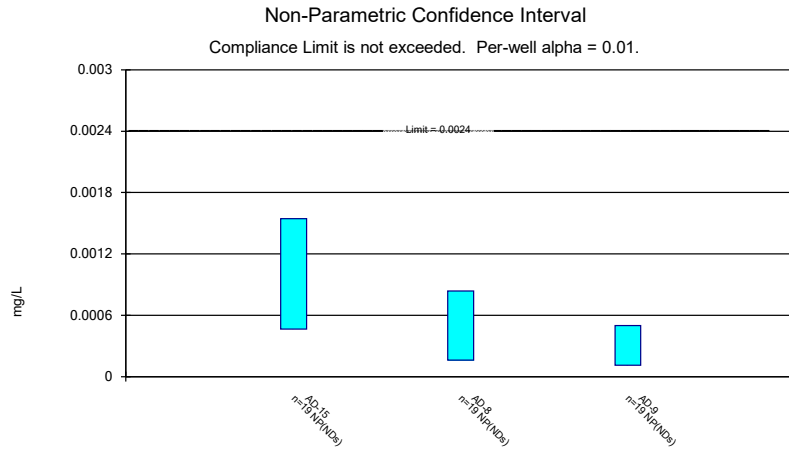
Constituent: Lithium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Parametric and Non-Parametric (NP) Confidence Interval

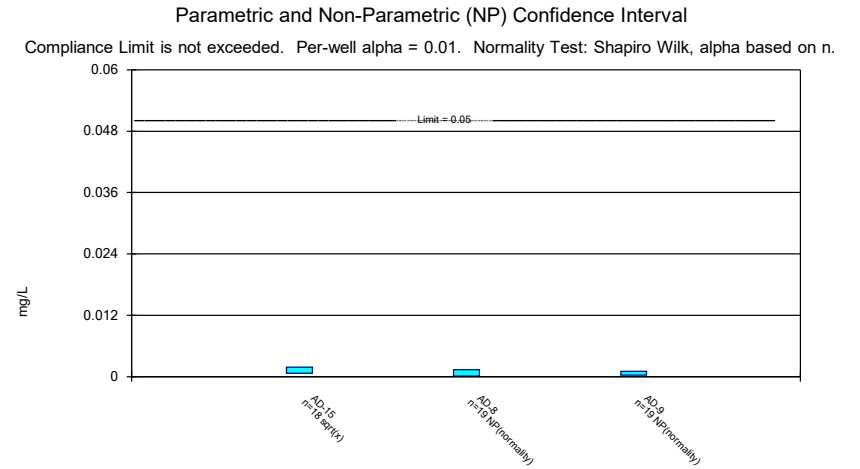
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



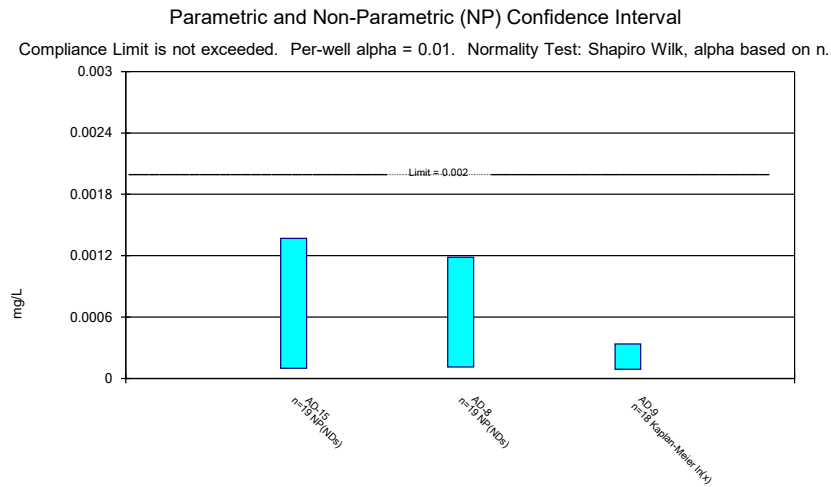
Constituent: Mercury, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



Constituent: Molybdenum, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



Constituent: Selenium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP



Constituent: Thallium, total Analysis Run 2/1/2022 9:47 AM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

# STATISTICAL ANALYSIS SUMMARY PRIMARY BOTTOM ASH POND

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CHA8500B

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Table 2	Appendix IV Groundwater Protection Standards
Table 3	Appendix III Data Summary

## LIST OF ATTACHMENTS

Attachment A	Certification by Qualified Professional Engineer
Attachment B	Data Quality Review Memorandum
Attachment C	Statistical Analysis Output

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
PBAP	Primary Bottom Ash Pond
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
SU	Standard Units
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
UTL	Upper Tolerance Limit

## SECTION 1

### EXECUTIVE SUMMARY

In accordance 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"), groundwater monitoring has been conducted at the Primary Bottom Ash Pond (PBAP), an existing CCR unit at the Welsh Power Plant located in Pittsburg, Texas. Recent groundwater monitoring results were compared to site-specific groundwater protection standards (GWPSs) to identify potential exceedances for CCR units in assessment monitoring.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron at the PBAP. An alternative source was not identified at the time, so assessment monitoring was initiated and GWPS were set in accordance with § 352.951(b). Two assessment monitoring events were conducted at the PBAP in March and June 2022 in accordance with § 352.951(a). The results of these assessment events are documented in this report.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at an SSL above previously established GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A. The statistical analysis and certification of the selected methods were completed within 90 days of obtaining the data.

## SECTION 2

### PRIMARY BOTTOM ASH POND EVALUATION

#### 2.1 Data Validation & QA/QC

During the assessment monitoring program in 2022, two sets of samples (March 2022 and June 2022) were collected for analysis. Samples were collected from each background and compliance well during the June 2022 event, whereas samples were collected only from the compliance well locations during the March 2022 event. Samples from both events were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during these assessment monitoring events may be found in Table 1.

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

A data quality review was completed to assess if the data met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis (TCEQ, 2020). The data were determined usable for supporting project objectives, as documented in the review memorandum provided in Attachment B. 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.9.6.32 statistics software. The export file was checked against the analytical data for transcription errors and completeness.

#### 2.2 Statistical Analysis

Time series plots and results for all completed statistical tests are provided in Attachment C. The data obtained in March and June 2022 were screened for potential outliers. No outliers were identified for this event.

##### 2.2.1 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ( $\alpha = 0.01$ ); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment C. The calculated confidence limits were compared to the GWPSs provided in Table 2. The GWPSs were established as either

the greater value of the background concentration calculated during a previous statistical analysis (Geosyntec, 2022) or the maximum contaminant level (MCL).

No SSLs were identified at the PBAP.

### **2.2.2 Evaluation of Potential Appendix III SSIs**

A review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Data collected during the June 2022 assessment monitoring event from each compliance well were compared to previously established prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) or, in the case of pH, values below the lower prediction limits (LPLs) were noted:

- Boron concentrations exceeded the interwell UPL of 0.801 mg/L at AD-8 (1.15 mg/L).
- The reported pH values were below the interwell LPL of 4.8 SU mg/L at AD-15 (4.5 SU).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (June 2022) sample was above the UPL or below the LPL. Based on these results, the boron and pH concentrations appear to be above or below the appropriate background concentrations and the unit will remain assessment monitoring.

### **2.3 Conclusions**

An annual and semi-annual assessment monitoring event were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that prevented data usage. A review of outliers identified no potential outliers in the March and June 2022 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. **No SSLs were identified.**

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. Boron concentrations exceeded and pH values were below background levels at select downgradient wells.

Based on this evaluation, the PBAP CCR unit will remain in assessment monitoring.



### **SECTION 3**

#### **REFERENCES**

Geosyntec Consultants, Inc. (Geosyntec). 2022. Statistical Analysis Summary – Primary Bottom Ash Pond, J. Robert Welsh Plant. February 10, 2022.

Texas Commission on Environmental Quality (TCEQ). 2020. Draft Technical Guidance No. 32. Coal Combustion Residuals Groundwater Monitoring and Corrective Action. May.

# TABLES

**Table 1: Groundwater Data Summary  
Welsh Plant - Primary Bottom Ash Pond**

Well ID		AD-1	AD-5	AD-8		AD-9		AD-15		AD-17
Well Classification		Background	Background	Compliance		Compliance		Compliance		Background
Parameter	Unit	6/28/2022	6/28/2022	3/1/2022	6/27/2022	3/1/2022	6/27/2022	3/1/2022	6/27/2022	6/28/2022
Antimony	µg/L	0.03 J1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1
Arsenic	µg/L	0.26	3.01	0.27	0.25	0.24	0.87	1.89	3.03	0.53
Barium	µg/L	85.4	51.8	23.6	26.1	55.3	49.7	75.1	78.5	12.6
Beryllium	µg/L	0.995	0.032 J1	0.25 U1	0.05 U1	1.20	0.780	0.207	0.088	0.040 J1
Boron	mg/L	0.768	0.048 J1	1.16	1.15	0.148	0.174	0.076	0.329	0.112
Cadmium	µg/L	0.030	0.02 U1	0.018 J1	0.018 J1	0.266	0.244	0.011 J1	0.015 J1	0.011 J1
Calcium	mg/L	6.76	32.9	18.7	19.5	12.0	109	2.63	3.25	167
Chloride	mg/L	2.32	15.3	15.9	15.9	18.3	59.8	25.0	30.9	37.0
Chromium	µg/L	0.37	0.22	0.23	0.41	0.74	0.59	0.55	0.38	0.40
Cobalt	µg/L	2.34	12.8	5.10	3.15	19.1	19.5	2.76	3.54	41.3
Combined Radium	pCi/L	3.69	2.06	1.31	1.39	3.35	3.52	2.01	2.15	6.54
Fluoride	mg/L	0.22	0.15	0.97	0.82	0.15	0.09 J1	0.05 J1	0.09	0.09 J1
Lead	µg/L	0.33	0.2 U1	0.2 U1	0.07 J1	0.08 J1	0.27	0.09 J1	0.05 J1	0.12 J1
Lithium	mg/L	0.00855	0.161	0.0654	0.0777	0.205	0.539	0.00208	0.00573	0.267
Mercury	µg/L	0.002 J1	0.005 U1	0.005 Q1, U1	0.005 U1	0.003 Q1, J1	0.005 U1	0.003 Q1, J1	0.005 U1	0.003 J1
Molybdenum	µg/L	0.5 U1	0.1 J1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.1 J1
Selenium	µg/L	8.35	0.5 U1	0.5 U1	0.5 U1	0.26 J1	0.46 J1	0.29 J1	0.63	0.5 U1
Sulfate	mg/L	74.7	146	138	156	109	933	4.29	18.9	1,050
Thallium	µg/L	0.05 J1	0.05 J1	0.13 J1	0.11 J1	0.22	0.22	0.05 J1	0.07 J1	0.2 U1
Total Dissolved Solids	mg/L	180	310	260	330	300	1,460	80	170	1,740
pH	SU	4.87	5.88	5.92	5.93	4.79	4.79	4.37	4.5	5.17

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J1: Estimated value. Parameter was detected in concentrations below the reporting limit.

Q1: Sample was received in inappropriate sample container.

**Table 2: Appendix IV Groundwater Protection Standards  
Welsh Plant - Primary Bottom Ash Pond**

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.00317	0.00600
Arsenic, Total (mg/L)	0.0100	0.00628	0.0100
Barium, Total (mg/L)	2.00	0.630	2.00
Beryllium, Total (mg/L)	0.00400	0.000762	0.00400
Cadmium, Total (mg/L)	0.00500	0.00400	0.00500
Chromium, Total (mg/L)	0.100	0.00235	0.100
Cobalt, Total (mg/L)	n/a	0.0748	0.0748
Combined Radium, Total (pCi/L)	5.00	3.84	5.00
Fluoride, Total (mg/L)	4.00	0.583	4.00
Lead, Total (mg/L)	n/a	0.00338	0.00338
Lithium, Total (mg/L)	n/a	0.394	0.394
Mercury, Total (mg/L)	0.00200	0.0000330	0.00200
Molybdenum, Total (mg/L)	n/a	0.00243	0.00243
Selenium, Total (mg/L)	0.0500	0.0160	0.0500
Thallium, Total (mg/L)	0.00200	0.00125	0.00200

Notes:

MCL = Maximum Contaminant Level

GWPS = Groundwater Protection Standard

Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

Grey cells indicate the GWPS is based on the calculated UTL, which is either higher than the MCL or an MCL does not exist.

**Table 3: Appendix III Data Summary  
Welsh - Primary Bottom Ash Pond**

Analyte	Unit	Description	AD-8	AD-9	AD-15
			6/27/2022	6/27/2022	6/27/2022
Boron	mg/L	Interwell Background Value (UPL)	0.801		
		Analytical Result	<b>1.15</b>	0.174	0.329
Calcium	mg/L	Intrawell Background Value (UPL)	30.2	292	4.97
		Analytical Result	19.5	109	3.25
Chloride	mg/L	Intrawell Background Value (UPL)	27.6	127	38.6
		Analytical Result	15.9	59.8	30.9
Fluoride	mg/L	Intrawell Background Value (UPL)	1.02	0.766	1.00
		Analytical Result	0.82	0.09	0.09
pH	SU	Interwell Background Value (UPL)	7.0		
		Interwell Background Value (LPL)	4.8		
		Analytical Result	5.9	4.8	<b>4.5</b>
Sulfate	mg/L	Intrawell Background Value (UPL)	214	2,370	32.5
		Analytical Result	156	933	18.9
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	514	2,870	282
		Analytical Result	330	1,460	170

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Background values are shaded gray.**

**Bold values exceed the background value.**

# ATTACHMENT A

Certification by Qualified Professional Engineer



**Certification by Qualified Professional Engineer**

I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Welsh Primary Bottom Ash Pond 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  
License Number

TEXAS  
Licensing State

11.07.22  
Date



**ATTACHMENT B**  
**Data Quality Review Memorandum**



## Memorandum

Date: October 19, 2022

To: David Miller (AEP)

Copies to: Jill Parker-Witt (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Data Quality Review – Welsh Power Plant  
June 2022 Sampling Event

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This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in June 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"). 40 CFR 257 Appendix III and IV constituents were analyzed.

The following sample data groups (SDGs) were associated with the thirty-six (36) groundwater samples collected during the June 2022 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222057
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222059
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222060
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222061
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222084
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222085
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222086
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 222087

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

The following data quality issues were identified:

- As reported in SDG 222084, barium, boron, chromium, cobalt, and lithium were detected in the equipment blank sample “EQ BLANK - BACKGROUND” collected on 6/28/2022. The detected boron concentration in the equipment blank (0.027 mg/L) was more than 10% of the detected value in sample AD-5 (0.048 mg/L), which could result in high bias in the AD-5 boron results. Likewise, the detected chromium concentration in the equipment blank (0.84 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.
- As reported in SDG 222085, barium, boron, chromium, cobalt, and lithium were detected in the equipment blank sample “EQUIPMENT BLANK – PBAP” collected on 6/27/2022. The detected boron concentration in the equipment blank (0.024 mg/L) was more than 10% of the detected value in sample AD-9 (0.174 mg/L), which could result in high bias in the AD-9 boron results. Likewise, the detected chromium concentration in the equipment blank (0.84 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.
- As reported in SDG 222086, barium, boron, chromium, cobalt, and lithium were detected in the equipment blank sample “EQUIPMENT BLANK – LANDFILL” collected on 6/27/2022. The detected chromium concentration in the equipment blank (0.96 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.
- As reported in SDG 222087, barium, boron, chromium, and cobalt were detected in the equipment blank sample “EQUIPMENT BLANK – BASP” collected on 6/28/2022. The detected boron concentration in the equipment blank (0.024 mg/L) was more than 10% of

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<sup>1</sup> TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

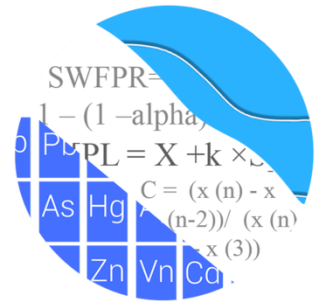
the detected values for boron in all groundwater samples, which could result in high bias for all groundwater boron results. Likewise, the detected chromium concentration in the equipment blank (0.90 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.

- As reported in SDG 222085, the relative percent difference (RPD) for chromium concentrations from parent sample “AD-15” and duplicate sample “DUPLICATE – PBAP” was 27%. The AD-15 chromium results should be considered estimated.
- As reported in SDG 222086, the matrix spike (MS) recovery (68.2%) and matrix spike duplicate (MSD) recovery (68%) for beryllium were below the acceptable range of 75-125%. The associated sample (AD-11) was flagged M1: the associated MS or MSD recovery was outside acceptance limits. The AD-11 beryllium results should be considered estimated.
- As reported in SDG 222060, the RPD for total dissolved solids (TDS; 17.5%) in the laboratory duplicate was above the acceptable limit of 10%. The associated sample (AD-14) was flagged P1: the precision between duplicate results was above acceptance limits. The AD-14 TDS 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.

**ATTACHMENT C**  
**Statistical Analysis Output**

## GROUNDWATER STATS CONSULTING



September 19, 2022

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

Re: Welsh PBAP – March & June 2022 Assessment Monitoring Report

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the March and June 2022 Assessment Monitoring report for American Electric Power Inc.'s Welsh PBAP. The analysis complies with the Texas Commission of Environmental Quality Rule 30 TAC 352 as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the Coal Combustion Residual (CCR) program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-1, AD-5, and AD-17
- **Downgradient wells:** AD-8, AD-9, and AD-15

Data were sent electronically, and the statistical analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting (GSC). The analysis was conducted according to the Statistical Analysis Plan prepared by GSC and approved by Dr. Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC.

The CCR Assessment Monitoring program consists of the following constituents:

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

Time series plots for Appendix IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). For all constituents, a substitution of the most recent reporting limit is used for non-detect data. While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

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. Values previously identified and flagged as outliers may be seen in the Outlier Summary following this letter (Figure C) and are plotted in a lighter font and disconnected symbol on the time series graphs. Note that the measured concentrations of most metals for the September 30, 2016 sample event at well AD-15 are very high compared to the rest of the observations and resulted from elevated turbidity levels of >1000 NTU. These values were flagged as outliers as they do not represent the population at this well.

### **Summary of Statistical Methods – Appendix IV Parameters**

Parametric tolerance 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. 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 (USEPA, 2009), data are analyzed using either parametric or non-parametric tolerance limits as appropriate.

- 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 in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent 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. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

## **Summary of Background Update – Conducted in February 2022**

### Outlier Analysis

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also cautiously flagged in the downgradient wells when they are clearly much different from the rest of the data. This is generally a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals, although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean. All flagged values may be seen on the Outlier Summary following this letter (Figure C) and no changes to previously flagged outliers were made.

Tukey's outlier test on pooled upgradient well data through October 2021 identified outliers for fluoride, lead, and mercury. The values identified by Tukey's test were either similar to concentrations upgradient of the facility or were lower than the respective Maximum Contaminant Level (MCL); therefore, none of these values were flagged as outliers. Although not identified by Tukey's test, the highest value for molybdenum in upgradient well AD-1 and two highest values for cadmium in upgradient well AD-17 were flagged in order to maintain statistical limits that are conservative (i.e., lower) from a regulatory perspective.

Additionally, downgradient well data through October 2021 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No new outliers among downgradient wells were flagged during the background update.

## Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through October 2021 for Appendix IV parameters (Figure D). For parametric limits a target of 95% confidence and 95% coverage is used. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

## Groundwater Protection Standards

These background limits were compared to the Maximum Contaminant Levels (MCLs) as shown in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the confidence interval comparisons (Figure E).

## **Evaluation of Appendix IV Parameters – March & June 2022**

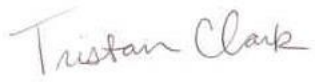
Time series plots were used to visually identify potential outliers in downgradient wells during the March and June 2022 sample events. When suspected outliers are identified, Tukey's outlier test is used to formally test whether measurements are statistically significant. As mentioned above, high outliers are 'cautiously' flagged in the downgradient wells when measurements are clearly much different from remaining data within a given well. This is intended to be a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals; although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean. No suspected outliers were identified.

Confidence intervals were then constructed with data through June 2022 on downgradient wells for each of the Appendix IV parameters and compared to the GWPS (i.e., the highest limit of the MCL or background limit as discussed above). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No exceedances were noted for any of the well/constituent pairs. A summary of the confidence interval results follows this letter (Figure F).



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

For Groundwater Stats Consulting,

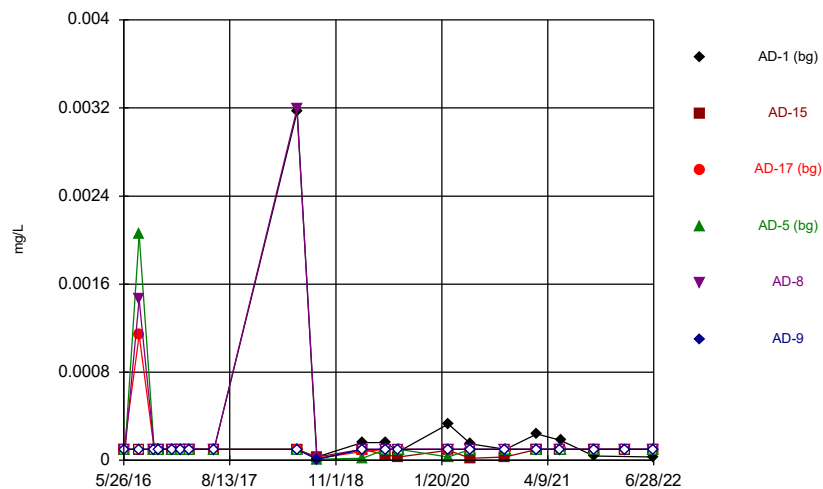


Tristan Clark  
Groundwater Analyst



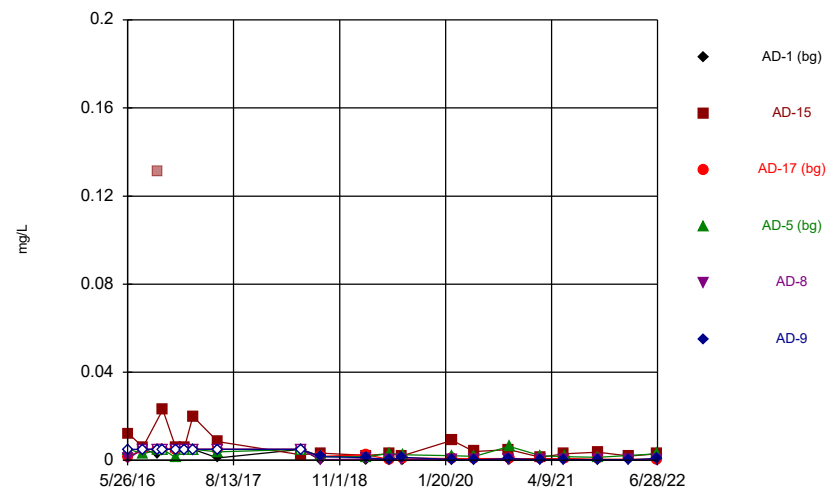
Andrew Collins  
Project Manager

### Time Series



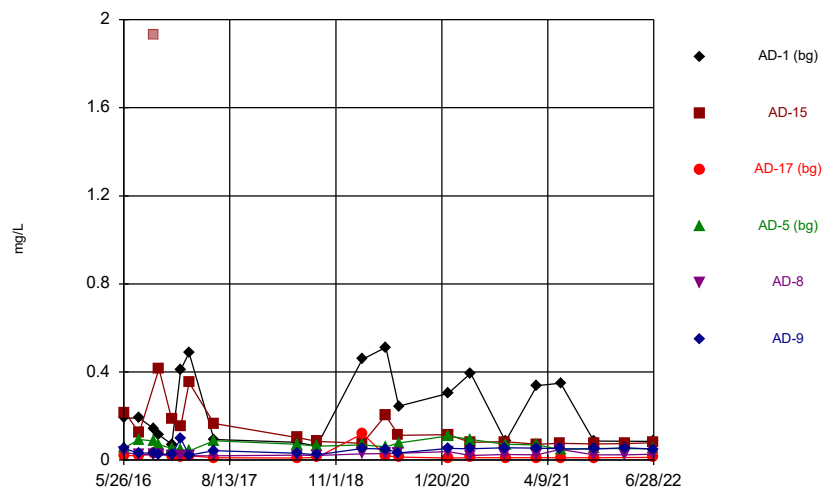
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



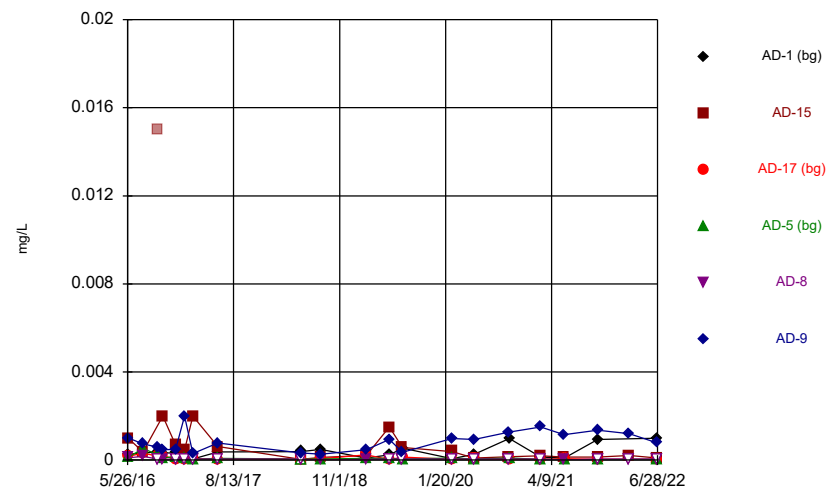
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



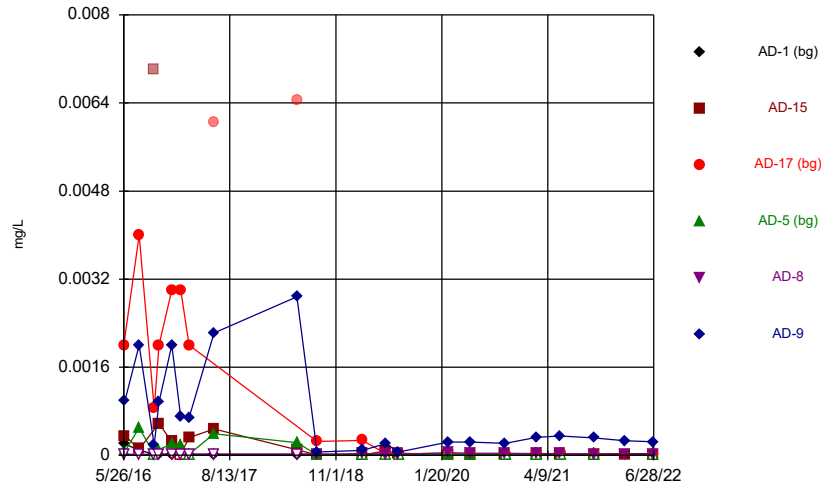
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Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



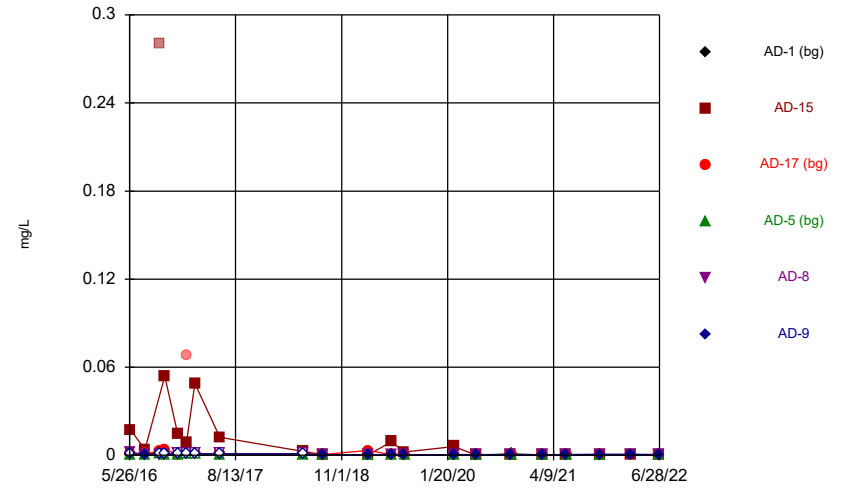
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Time Series



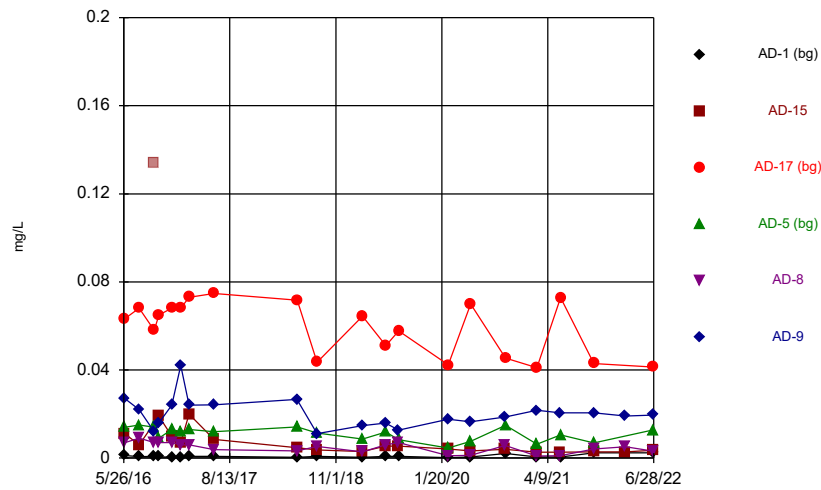
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Time Series



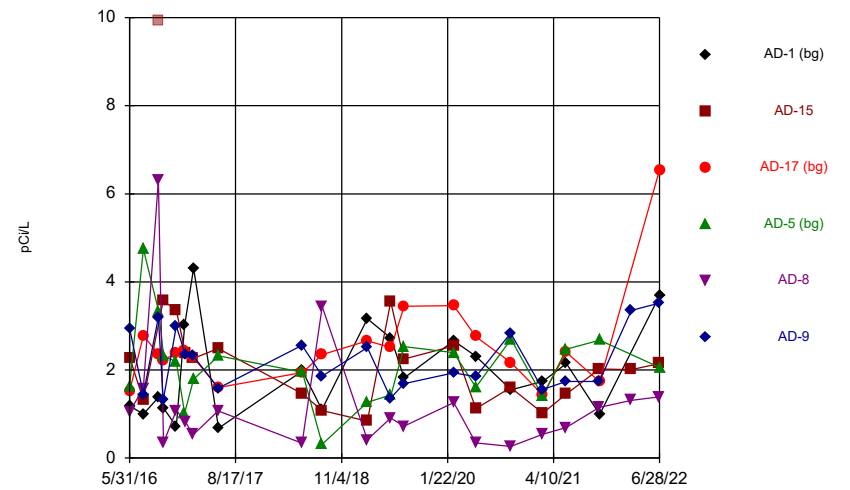
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Time Series



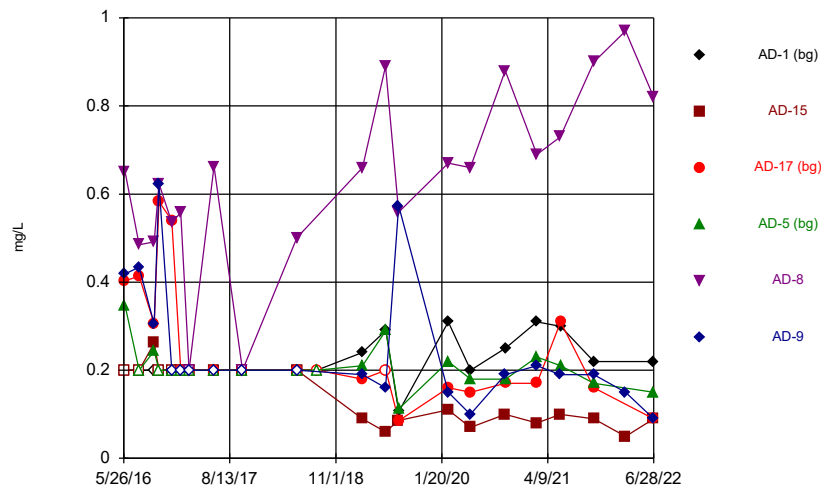
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Time Series

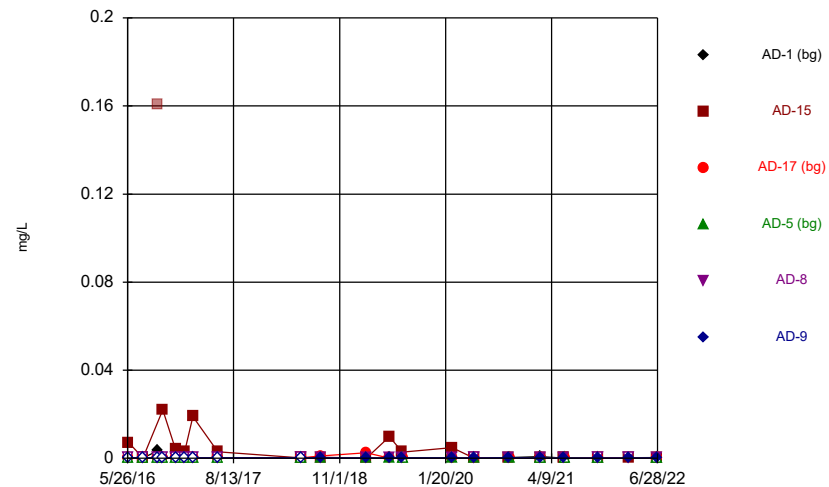


Constituent: Combined Radium 226 + 228 Analysis Run 9/15/2022 9:26 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

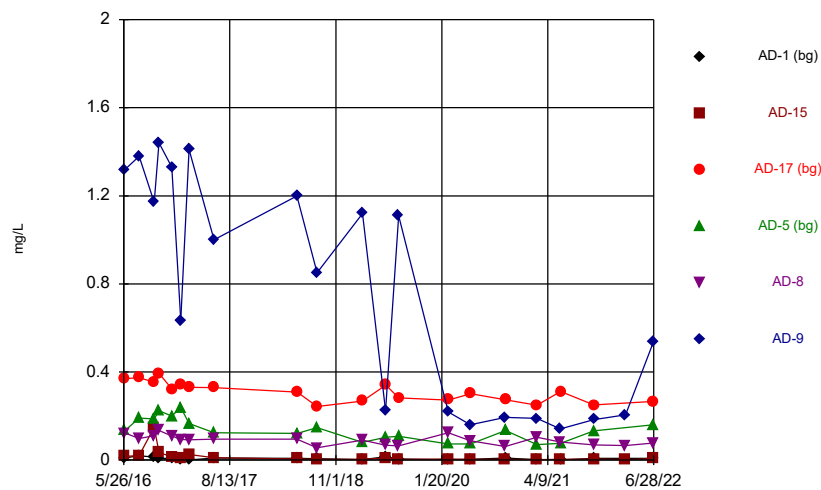
### Time Series



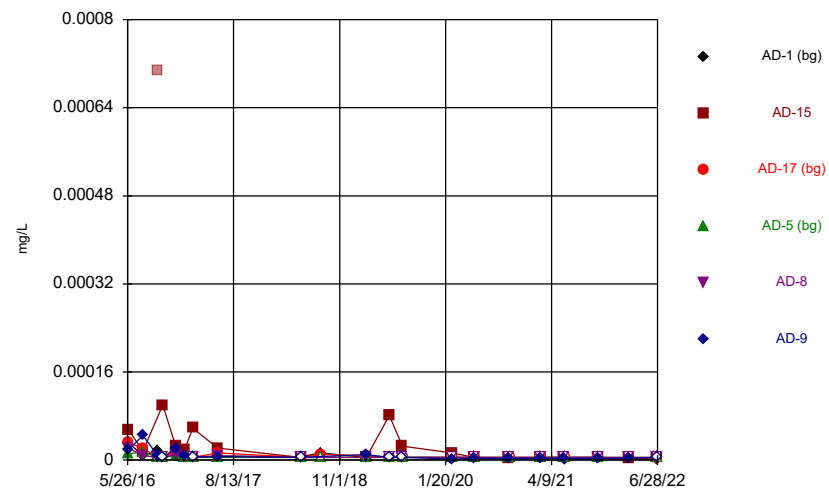
### Time Series



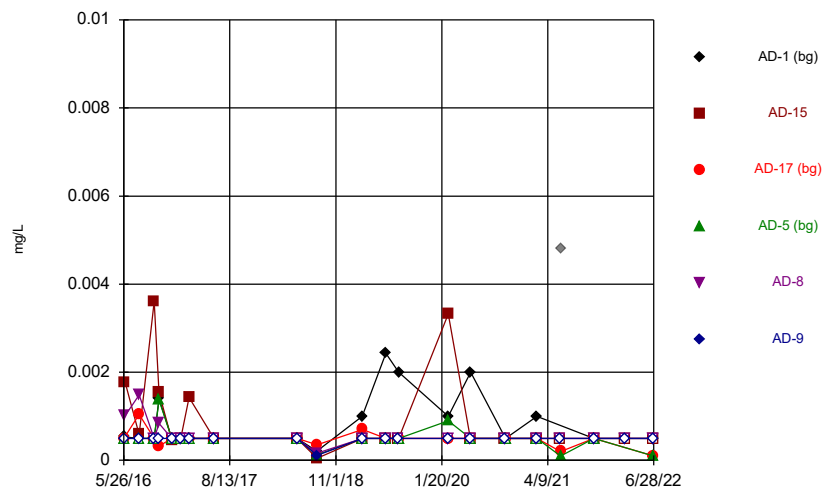
### Time Series



### Time Series

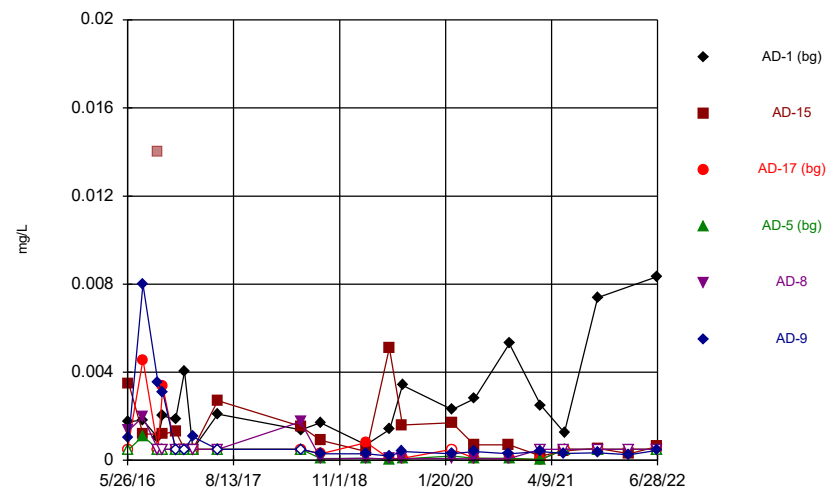


### Time Series



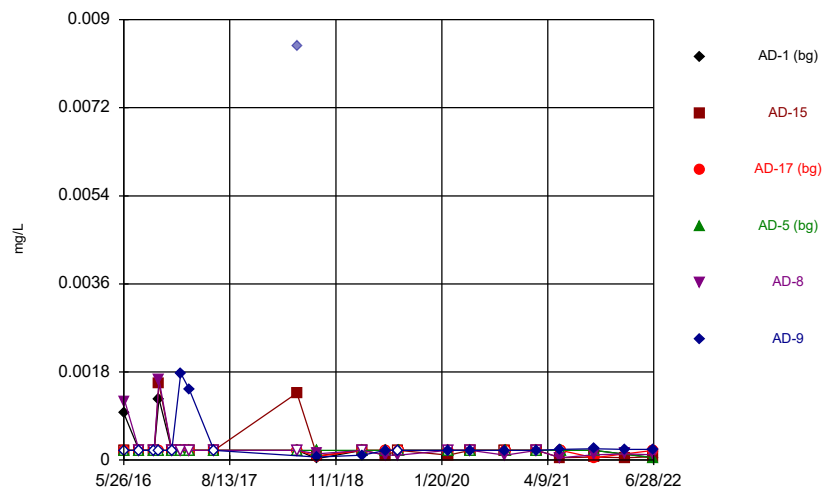
Constituent: Molybdenum, total Analysis Run 9/15/2022 9:26 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



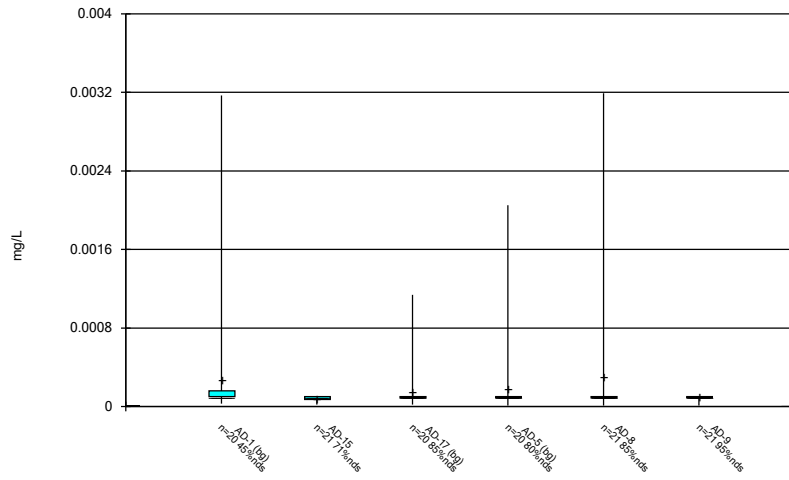
Constituent: Selenium, total Analysis Run 9/15/2022 9:26 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Time Series



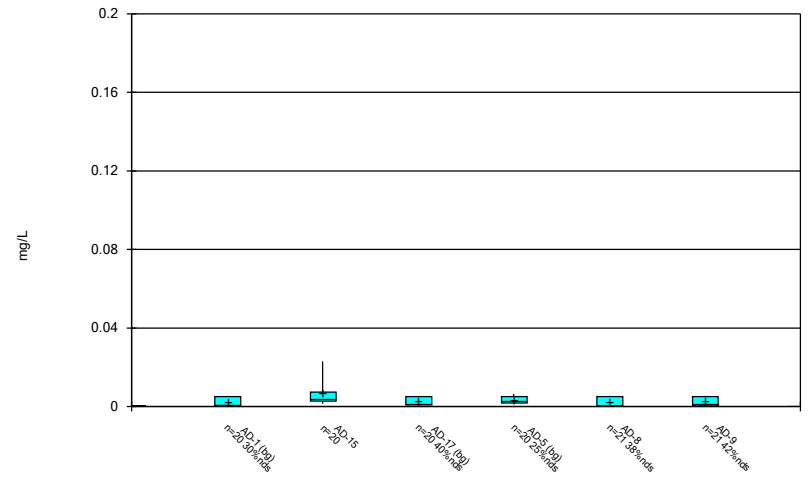
Constituent: Thallium, total Analysis Run 9/15/2022 9:26 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



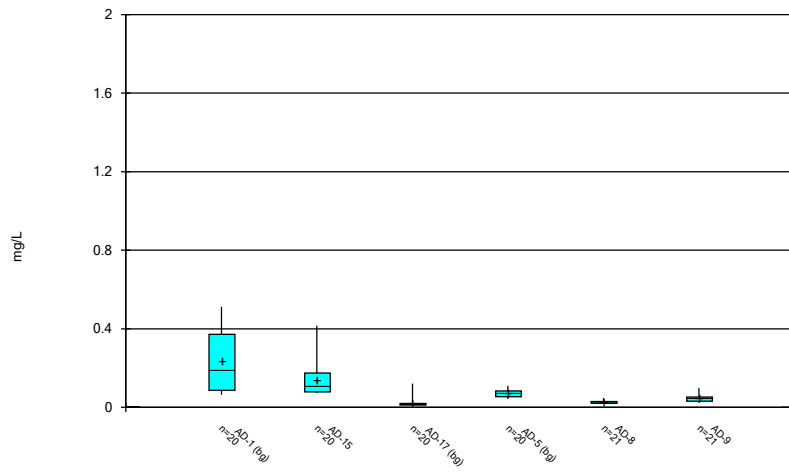
Constituent: Antimony, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



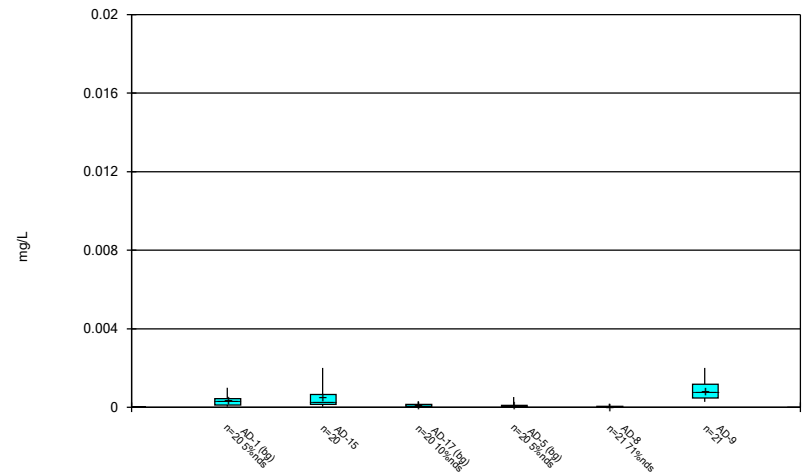
Constituent: Arsenic, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



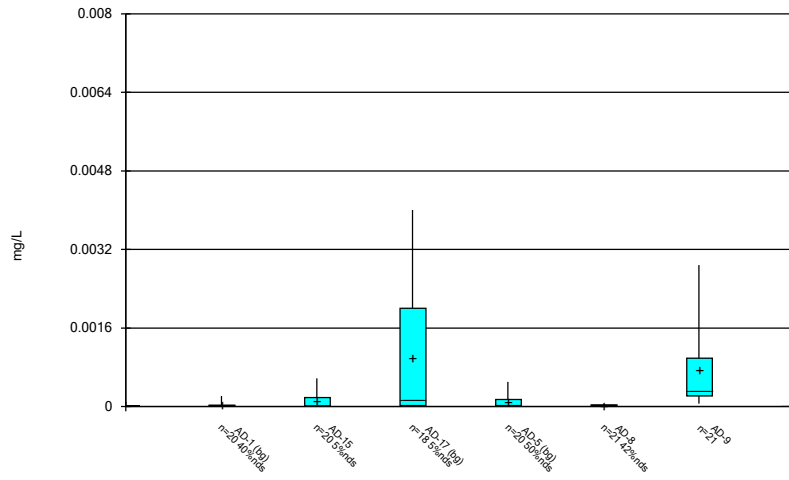
Constituent: Barium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



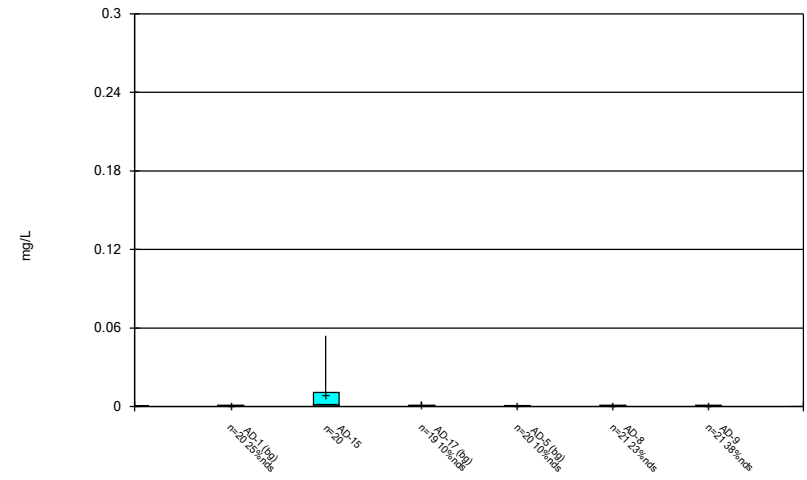
Constituent: Beryllium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



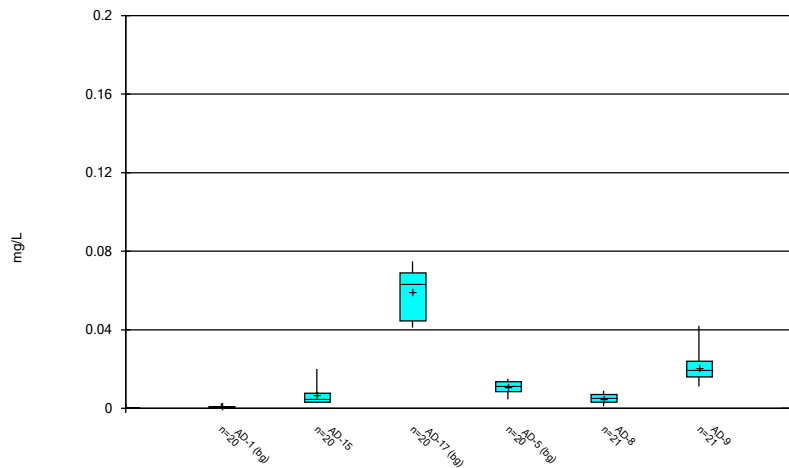
Constituent: Cadmium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



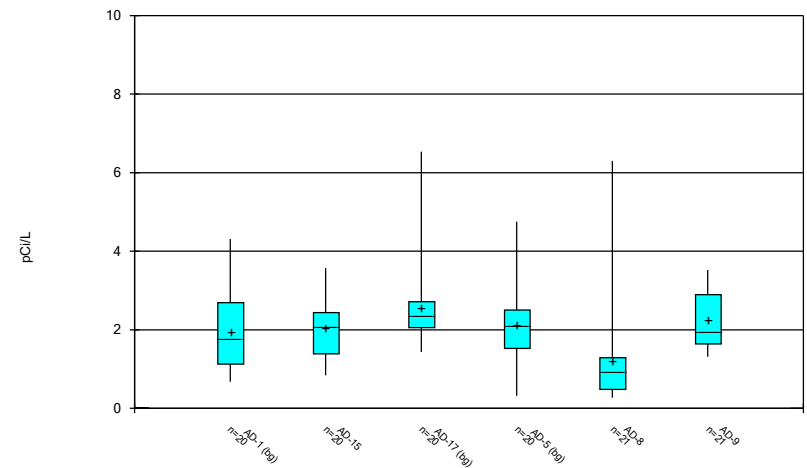
Constituent: Chromium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



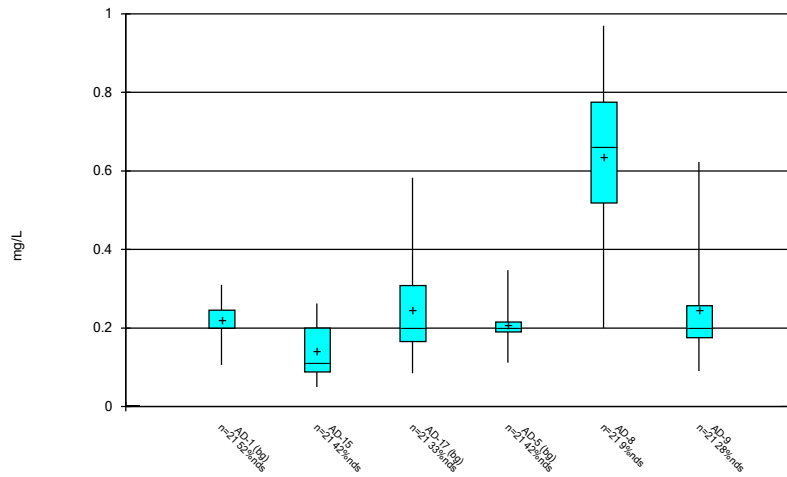
Constituent: Cobalt, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Box & Whiskers Plot



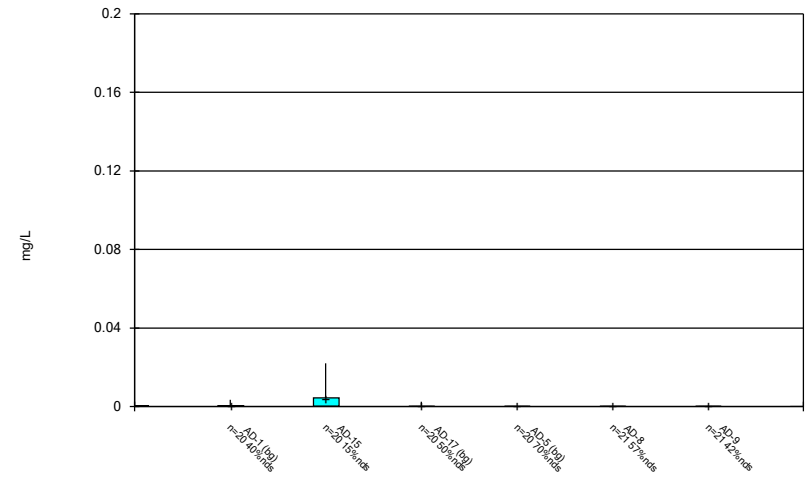
Constituent: Combined Radium 226 + 228 Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



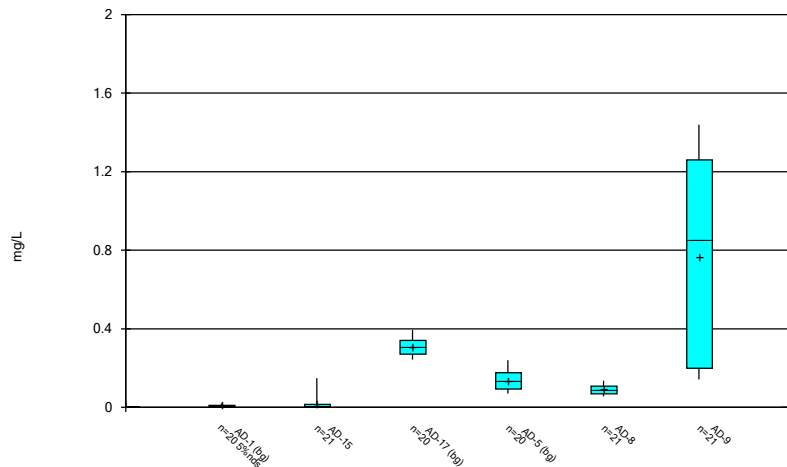
Constituent: Fluoride, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



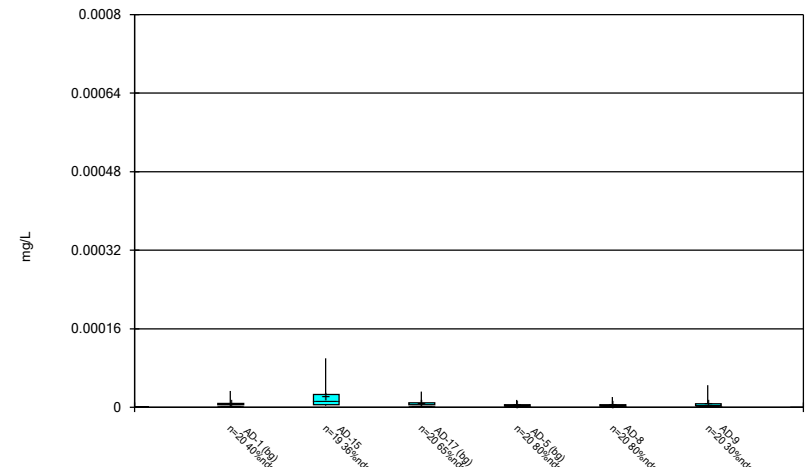
Constituent: Lead, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



Constituent: Lithium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

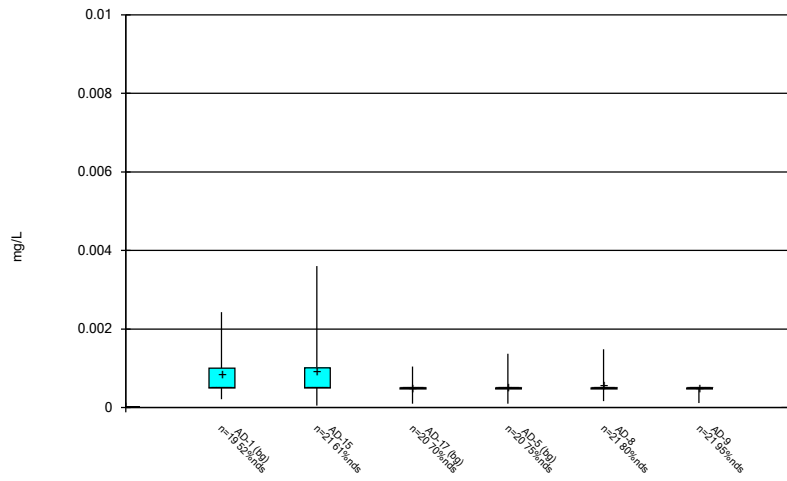
Box & Whiskers Plot



Constituent: Mercury, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

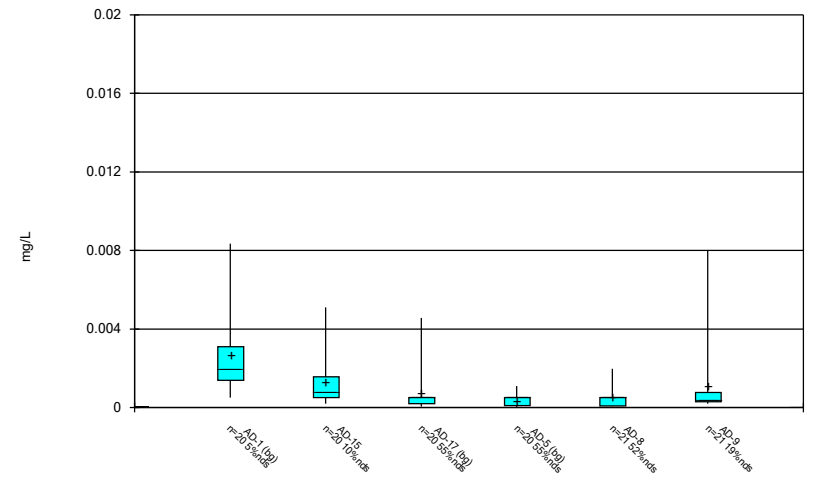


Box & Whiskers Plot



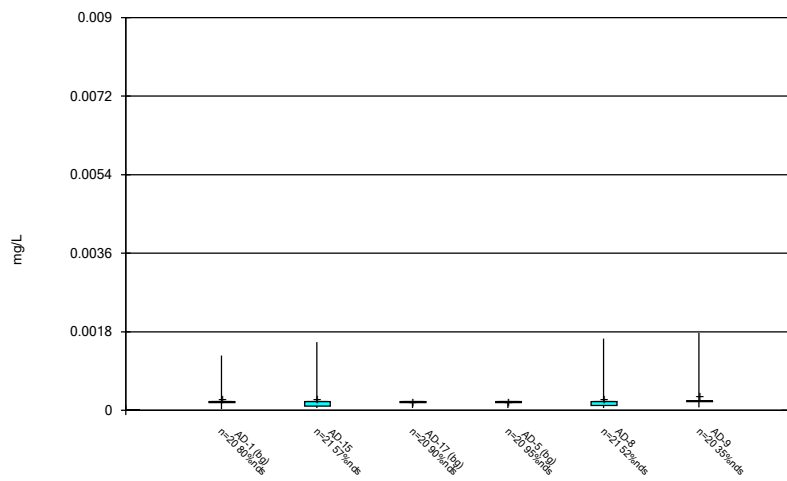
Constituent: Molybdenum, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 9/15/2022 9:27 AM View: Appendix IV  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

# Outlier Summary

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 9/15/2022, 9:28 AM

AD-15 Arsenic, total (mg/L) AD-15 Barium, total (mg/L) AD-15 Beryllium, total (mg/L) AD-15 Cadmium, total (mg/L) AD-17 Cadmium, total (mg/L) AD-15 Chromium, total (mg/L) AD-17 Chromium, total (mg/L) AD-15 Cobalt, total (mg/L) AD-15 Combined Radium 226 + 228 (pCi/L) AD-15 Lead, total (mg/L)

Date	AD-15 Arsenic, total (mg/L)	AD-15 Barium, total (mg/L)	AD-15 Beryllium, total (mg/L)	AD-15 Cadmium, total (mg/L)	AD-17 Cadmium, total (mg/L)	AD-15 Chromium, total (mg/L)	AD-17 Chromium, total (mg/L)	AD-15 Cobalt, total (mg/L)	AD-15 Combined Radium 226 + 228 (pCi/L)	AD-15 Lead, total (mg/L)
9/29/2016									9.92 (o)	
9/30/2016	0.131 (o)	1.93 (o)	0.015 (o)	0.007 (o)		0.28 (o)		0.134 (o)		0.161 (o)
1/20/2017							0.068 (o)			
6/8/2017					0.00606 (o)					
5/23/2018										
5/24/2018					0.00646 (o)					
6/2/2021										

AD-15 Mercury, total (mg/L) AD-1 Molybdenum, total (mg/L) AD-15 Selenium, total (mg/L) AD-9 Thallium, total (mg/L)

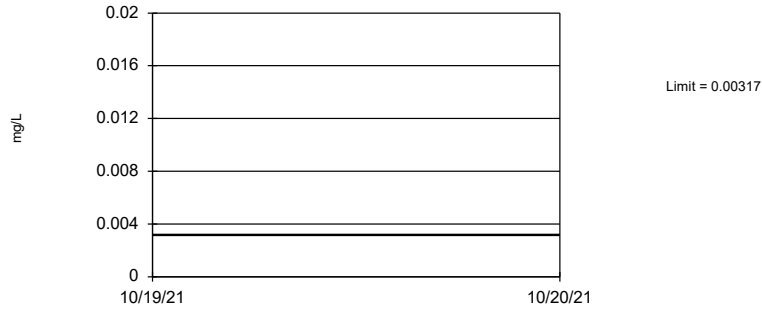
Date	AD-15 Mercury, total (mg/L)	AD-1 Molybdenum, total (mg/L)	AD-15 Selenium, total (mg/L)	AD-9 Thallium, total (mg/L)
9/29/2016				
9/30/2016	0.000707 (o)		0.014 (o)	
1/20/2017				
6/8/2017				
5/23/2018			0.00846 (o)	
5/24/2018				
6/2/2021		0.0048 (o)		

# Upper Tolerance Limits

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 2/1/2022, 9:42 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00317	n/a	n/a	n/a	57	n/a	n/a	70.18	n/a	n/a	0.05373	NP Inter(NDs)
Arsenic, total (mg/L)	n/a	0.00628	n/a	n/a	n/a	57	n/a	n/a	33.33	n/a	n/a	0.05373	NP Inter(normality)
Barium, total (mg/L)	n/a	0.6299	n/a	n/a	n/a	57	-2.819	1.162	0	None	ln(x)	0.05	Inter
Beryllium, total (mg/L)	n/a	0.0007622	n/a	n/a	n/a	57	0.05309	0.01886	7.018	None	x^(1/3)	0.05	Inter
Cadmium, total (mg/L)	n/a	0.004	n/a	n/a	n/a	55	n/a	n/a	32.73	n/a	n/a	0.05954	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.00235	n/a	n/a	n/a	56	-8.217	1.064	16.07	Kaplan-Meier	ln(x)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.0748	n/a	n/a	n/a	57	n/a	n/a	0	n/a	n/a	0.05373	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	n/a	3.838	n/a	n/a	n/a	57	2.108	0.8532	0	None	No	0.05	Inter
Fluoride, total (mg/L)	n/a	0.583	n/a	n/a	n/a	60	n/a	n/a	45	n/a	n/a	0.04607	NP Inter(normality)
Lead, total (mg/L)	n/a	0.003384	n/a	n/a	n/a	57	n/a	n/a	54.39	n/a	n/a	0.05373	NP Inter(NDs)
Lithium, total (mg/L)	n/a	0.394	n/a	n/a	n/a	57	n/a	n/a	1.754	n/a	n/a	0.05373	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000033	n/a	n/a	n/a	57	n/a	n/a	63.16	n/a	n/a	0.05373	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.00243	n/a	n/a	n/a	56	n/a	n/a	67.86	n/a	n/a	0.05656	NP Inter(NDs)
Selenium, total (mg/L)	n/a	0.016	n/a	n/a	n/a	57	-7.827	1.82	36.84	Kaplan-Meier	ln(x)	0.05	Inter
Thallium, total (mg/L)	n/a	0.001251	n/a	n/a	n/a	57	n/a	n/a	91.23	n/a	n/a	0.05373	NP Inter(NDs)

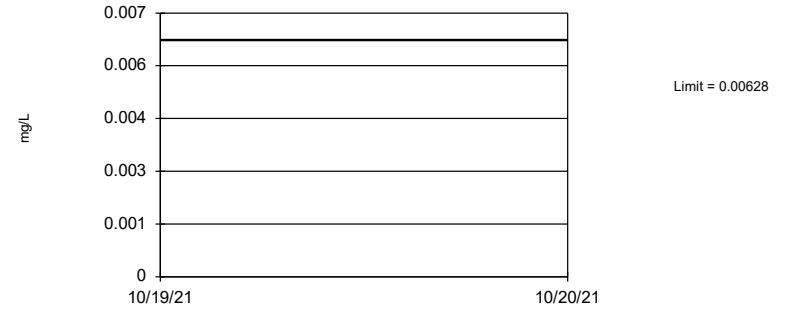
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 70.18% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Antimony, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

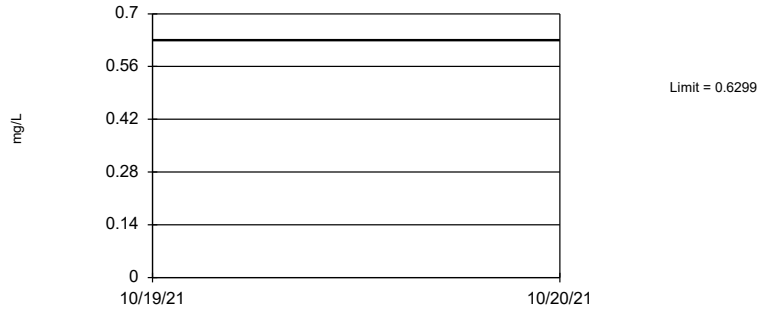
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 33.33% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Arsenic, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

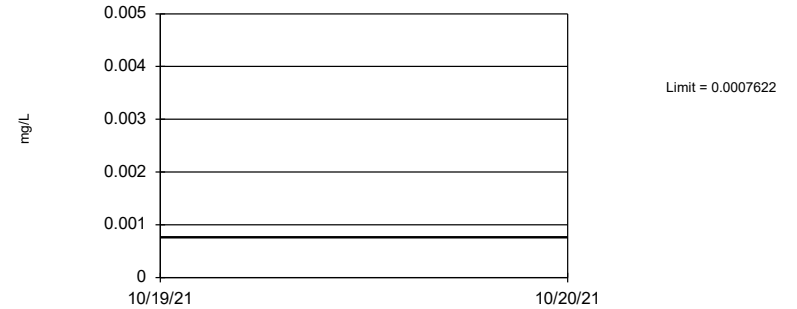
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-2.819, Std. Dev.=1.162, n=57. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9595, critical = 0.944. Report alpha = 0.05.

Constituent: Barium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.05309, Std. Dev.=0.01886, n=57, 7.018% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.946, critical = 0.944. Report alpha = 0.05.

Constituent: Beryllium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

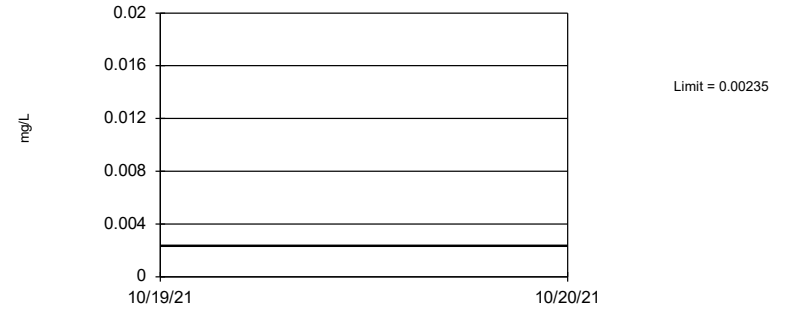
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 55 background values. 32.73% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05954.

Constituent: Cadmium, total Analysis Run 2/1/2022 9:40 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

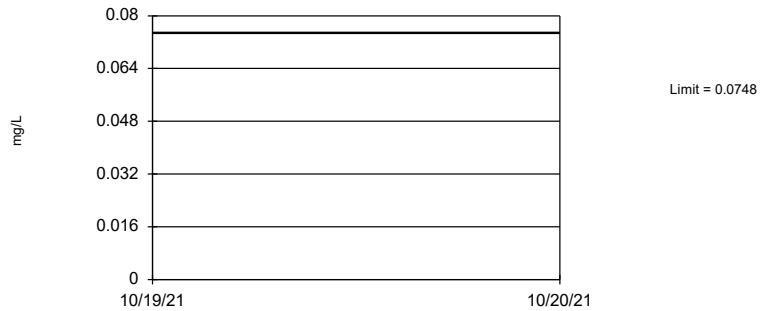
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-8.217, Std. Dev.=1.064, n=56, 16.07% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9539, critical = 0.942. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

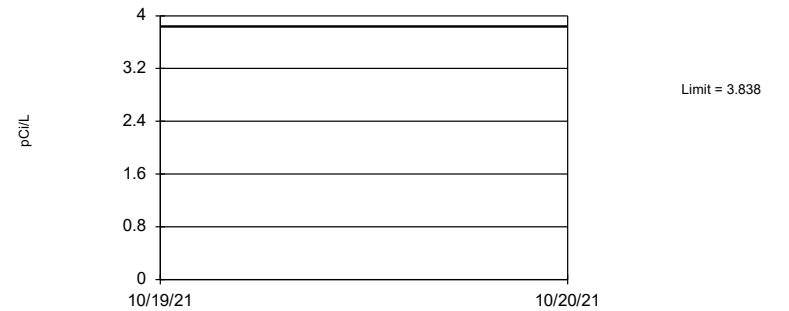
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Cobalt, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

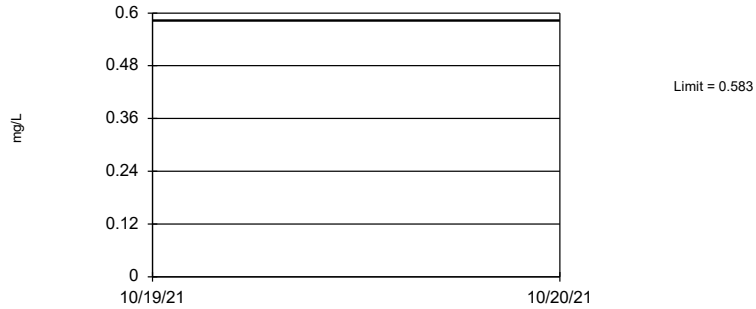
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=2.108, Std. Dev.=0.8532, n=57. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9636, critical = 0.944. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

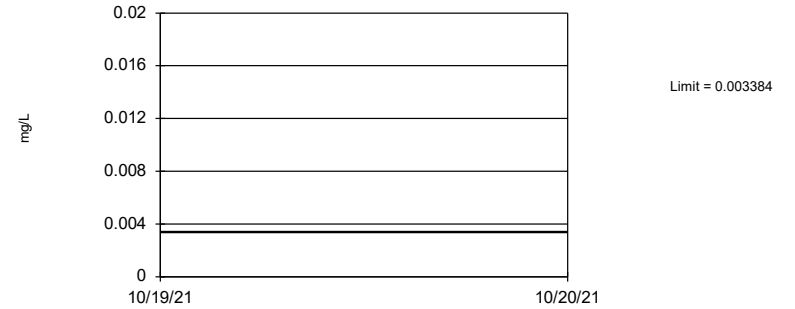
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 60 background values. 45% NDs. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04607.

Constituent: Fluoride, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

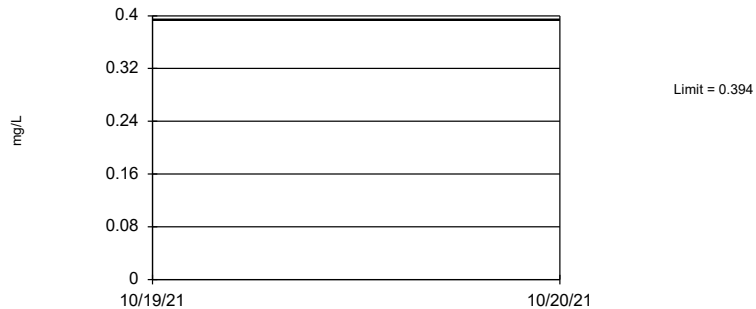
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 54.39% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Lead, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

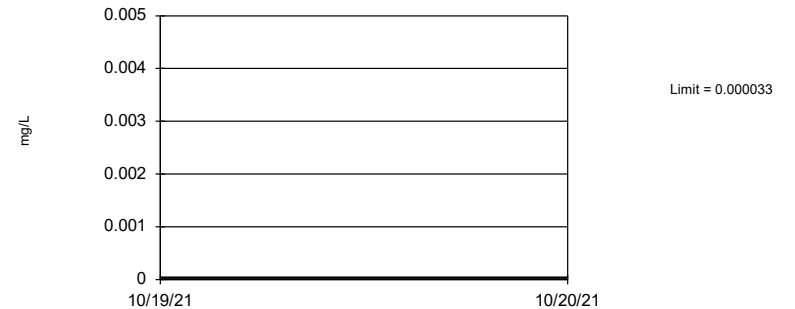
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 57 background values. 1.754% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Lithium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

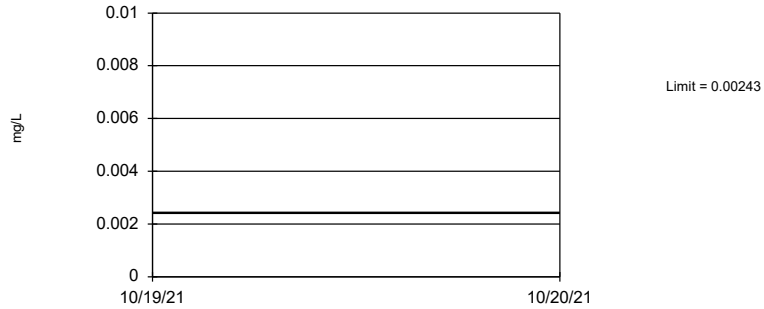
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 63.16% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Mercury, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 67.86% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Molybdenum, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-7.827, Std. Dev.=1.82, n=57, 36.84% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9462, critical = 0.944. Report alpha = 0.05.

Constituent: Selenium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 57 background values. 91.23% NDs. 92.38% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05373.

Constituent: Thallium, total Analysis Run 2/1/2022 9:41 AM View: UTLs  
Welsh PBAP Client: Geosyntec Data: Welsh PBAP

<b>WELSH PBAP GWPS</b>			
<b>Constituent Name</b>	<b>MCL</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006	0.0032	0.006
Arsenic, Total (mg/L)	0.01	0.0063	0.01
Barium, Total (mg/L)	2	0.63	2
Beryllium, Total (mg/L)	0.004	0.00076	0.004
Cadmium, Total (mg/L)	0.005	0.004	0.005
Chromium, Total (mg/L)	0.1	0.0024	0.1
Cobalt, Total (mg/L)	n/a	0.075	0.075
Combined Radium, Total (pCi/L)	5	3.84	5
Fluoride, Total (mg/L)	4	0.58	4
Lead, Total (mg/L)	n/a	0.0034	0.0034
Lithium, Total (mg/L)	n/a	0.39	0.39
Mercury, Total (mg/L)	0.002	0.000033	0.002
Molybdenum, Total (mg/L)	n/a	0.0024	0.0024
Selenium, Total (mg/L)	0.05	0.016	0.05
Thallium, Total (mg/L)	0.002	0.0013	0.002

*\*MCL = Maximum Contaminant Level*

*\*GWPS = Groundwater Protection Standard*



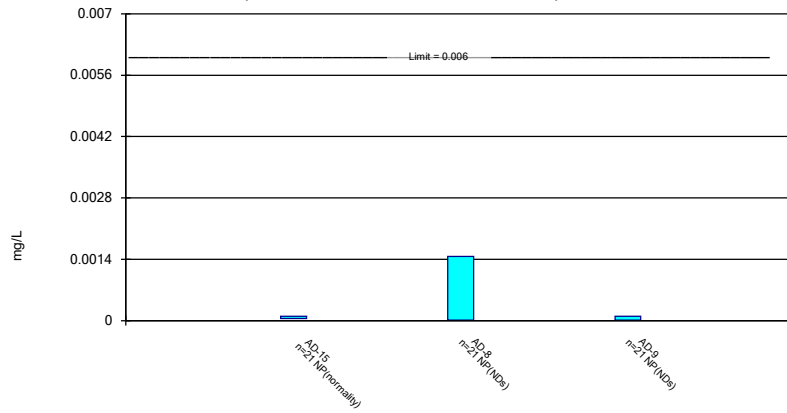
# Confidence Interval - All Results (No Significant)

Welsh PBAP Client: Geosyntec Data: Welsh PBAP Printed 9/16/2022, 3:53 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	AD-15	0.0001	0.00005	0.006	No	21	71.43	No	0.01	NP (normality)
Antimony, total (mg/L)	AD-8	0.001461	0.00001	0.006	No	21	85.71	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-9	0.0001	0.00001	0.006	No	21	95.24	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-15	0.007857	0.003046	0.01	No	20	0	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	AD-8	0.005	0.0003	0.01	No	21	38.1	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-9	0.005	0.00027	0.01	No	21	42.86	No	0.01	NP (normality)
Barium, total (mg/L)	AD-15	0.184	0.0769	2	No	20	0	No	0.01	NP (normality)
Barium, total (mg/L)	AD-8	0.02933	0.02231	2	No	21	0	x^(1/3)	0.01	Param.
Barium, total (mg/L)	AD-9	0.05271	0.03493	2	No	21	0	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	AD-15	0.0007295	0.0001892	0.004	No	20	0	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	AD-8	0.0001145	0.00003	0.004	No	21	71.43	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-9	0.001103	0.0006009	0.004	No	21	0	No	0.01	Param.
Cadmium, total (mg/L)	AD-15	0.0003194	0.000011	0.005	No	20	5	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-8	0.001	0.000021	0.005	No	21	42.86	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-9	0.0008845	0.0002385	0.005	No	21	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	AD-15	0.009726	0.0009452	0.1	No	20	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	AD-8	0.000483	0.0001533	0.1	No	21	23.81	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	AD-9	0.000525	0.0003495	0.1	No	21	38.1	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	AD-15	0.007461	0.003664	0.075	No	20	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	AD-8	0.006065	0.003421	0.075	No	21	0	No	0.01	Param.
Cobalt, total (mg/L)	AD-9	0.02404	0.0166	0.075	No	21	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-15	2.503	1.574	5	No	20	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-8	1.333	0.5672	5	No	21	0	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-9	2.608	1.837	5	No	21	0	No	0.01	Param.
Fluoride, total (mg/L)	AD-15	1	0.086	4	No	21	42.86	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-8	0.8056	0.6169	4	No	21	9.524	No	0.01	Param.
Fluoride, total (mg/L)	AD-9	0.2832	0.1361	4	No	21	28.57	ln(x)	0.01	Param.
Lead, total (mg/L)	AD-15	0.002486	0.0002351	0.0034	No	20	15	ln(x)	0.01	Param.
Lead, total (mg/L)	AD-8	0.0002	0.00007	0.0034	No	21	57.14	No	0.01	NP (normality)
Lead, total (mg/L)	AD-9	0.0002	0.00008	0.0034	No	21	42.86	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-15	0.01364	0.004177	0.39	No	21	0	ln(x)	0.01	Param.
Lithium, total (mg/L)	AD-8	0.1028	0.07827	0.39	No	21	0	No	0.01	Param.
Lithium, total (mg/L)	AD-9	1.32	0.194	0.39	No	21	0	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-15	0.000054	0.000005	0.002	No	19	36.84	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-8	0.000008	0.000005	0.002	No	20	80	No	0.01	NP (NDs)
Mercury, total (mg/L)	AD-9	0.0000739	0.000003	0.002	No	20	30	No	0.01	NP (normality)
Molybdenum, total (mg/L)	AD-15	0.001427	0.0004635	0.0024	No	21	61.9	No	0.01	NP (normality)
Molybdenum, total (mg/L)	AD-8	0.0008389	0.00016	0.0024	No	21	80.95	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-9	0.0005	0.00011	0.0024	No	21	95.24	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-15	0.001692	0.0005996	0.05	No	20	10	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	AD-8	0.00137	0.00008	0.05	No	21	52.38	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-9	0.001042	0.0003	0.05	No	21	19.05	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-15	0.00137	0.00009	0.002	No	21	57.14	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-8	0.0005	0.00011	0.002	No	21	52.38	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-9	0.0002857	0.00008587	0.002	No	20	35	ln(x)	0.01	Param.

### Non-Parametric Confidence Interval

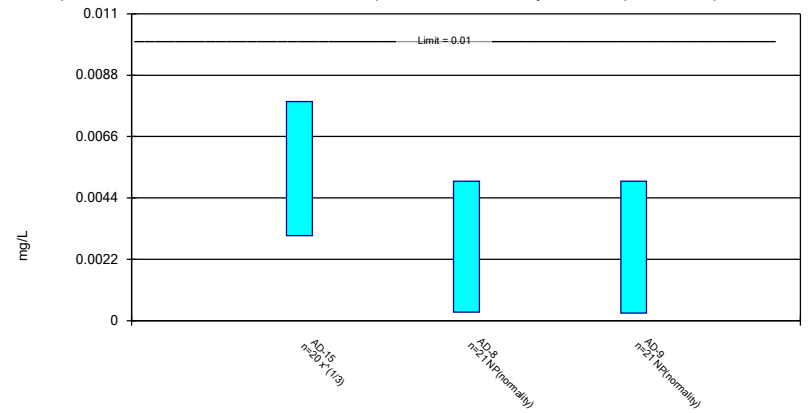
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

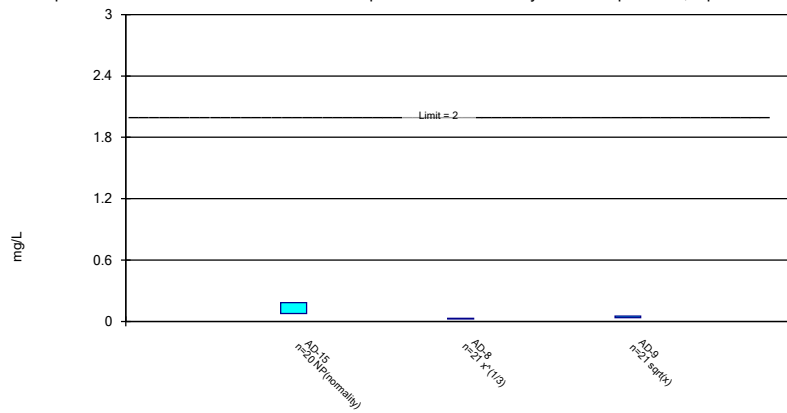
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

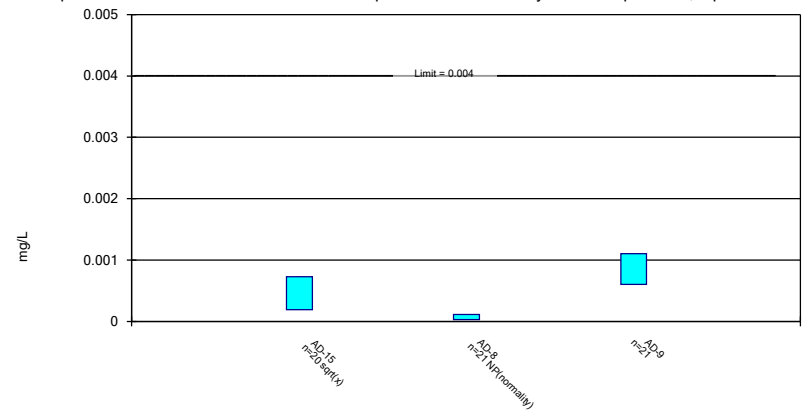
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

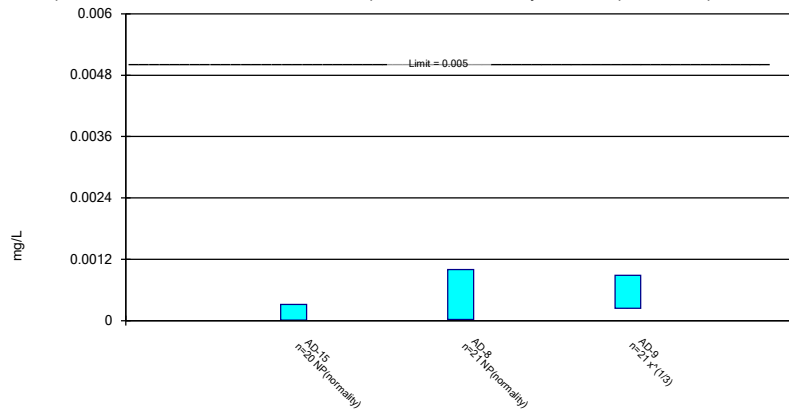
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

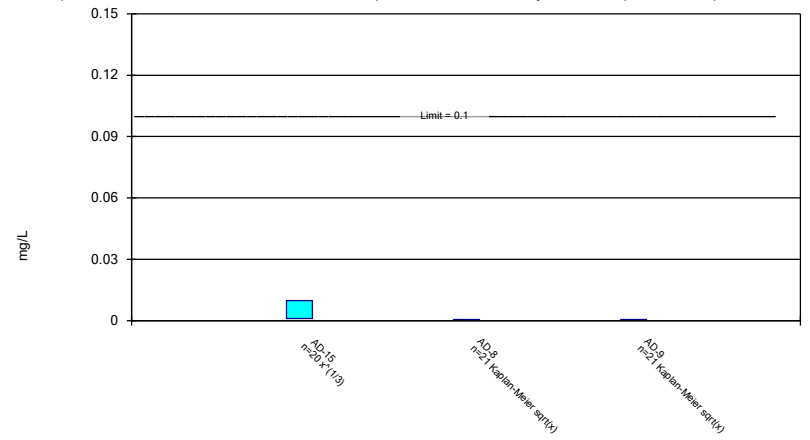
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric Confidence Interval

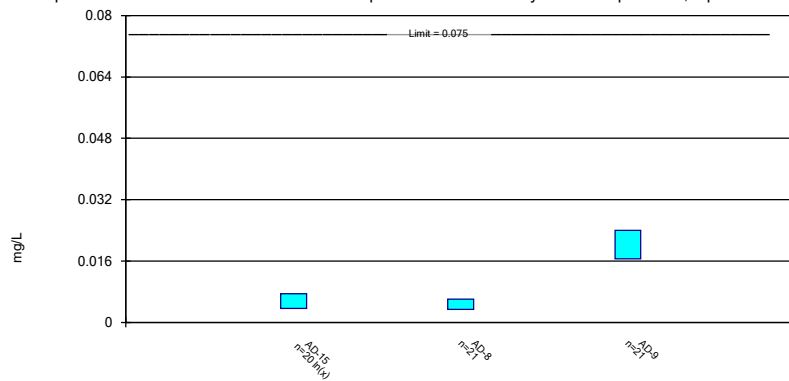
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric Confidence Interval

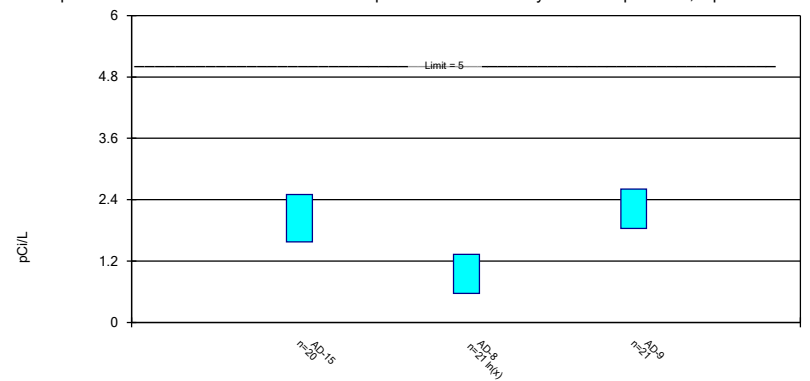
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric Confidence Interval

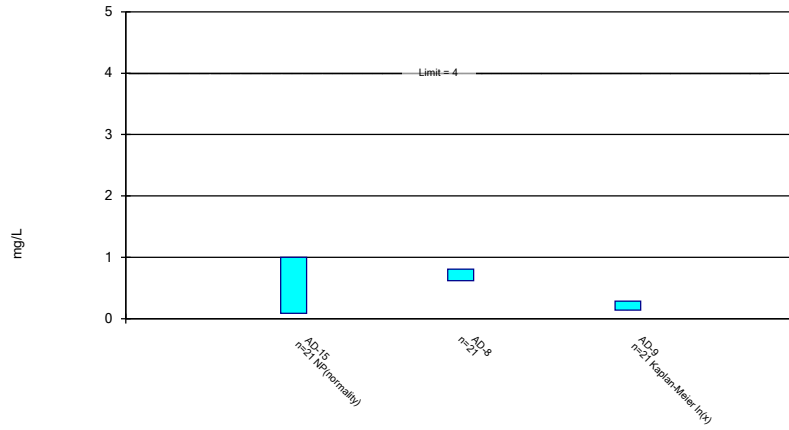
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

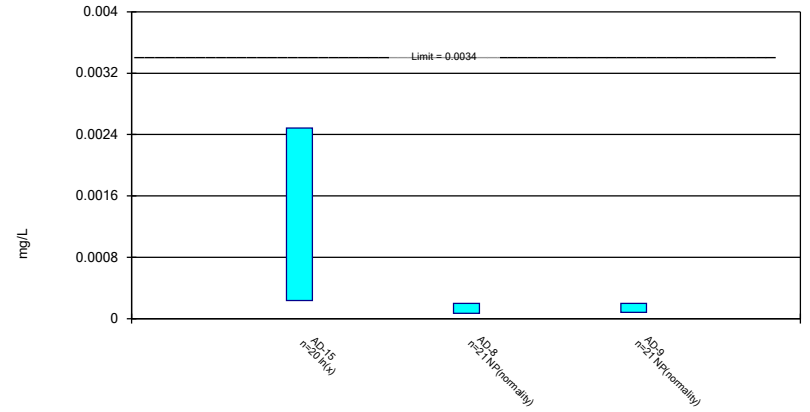
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

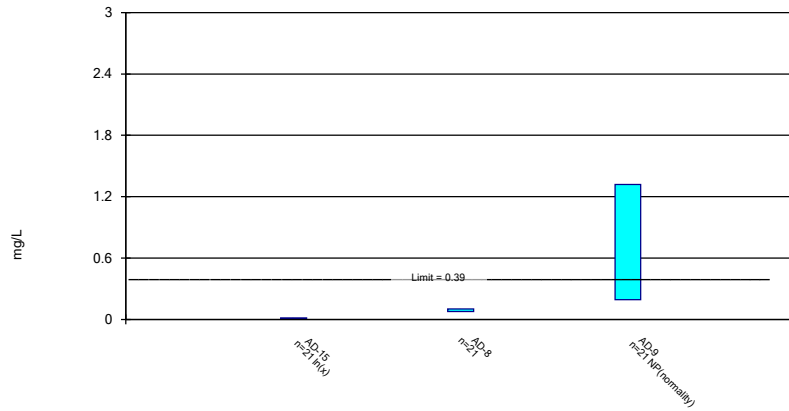
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

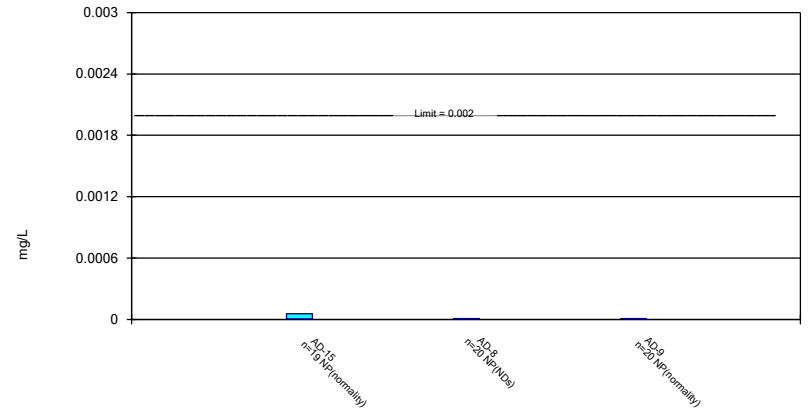
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Non-Parametric Confidence Interval

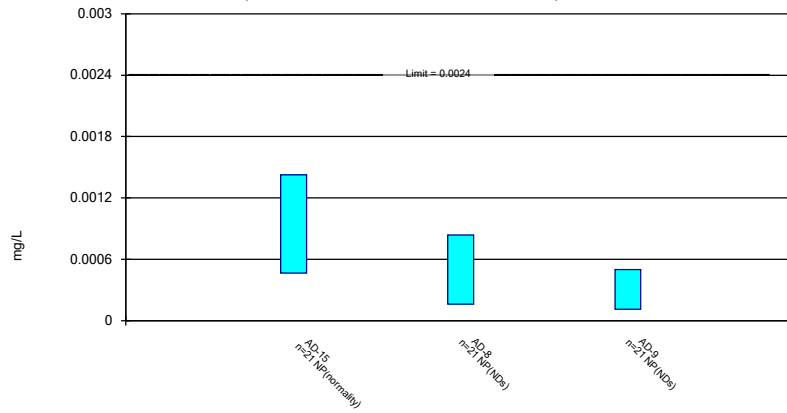
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 9/16/2022 3:52 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Non-Parametric Confidence Interval

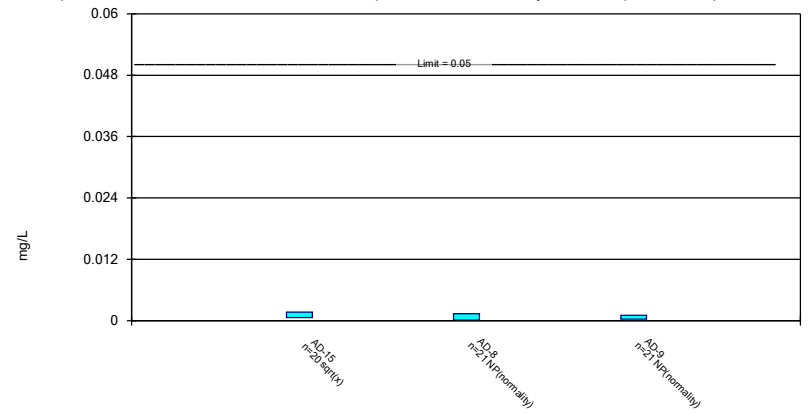
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 9/16/2022 3:53 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

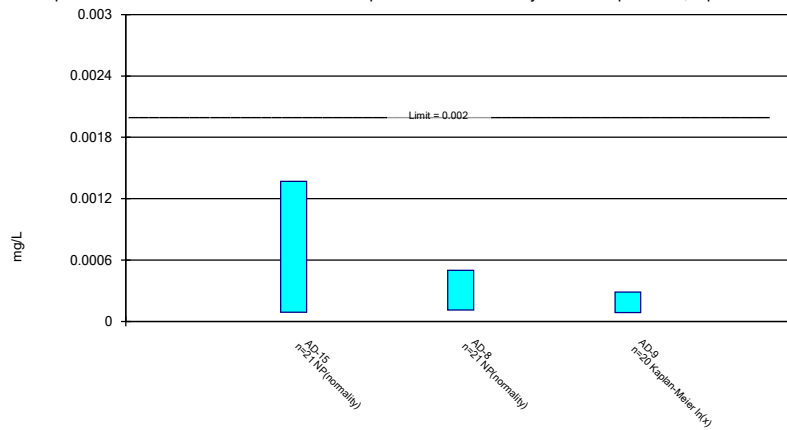
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 9/16/2022 3:53 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

### Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Thallium, total Analysis Run 9/16/2022 3:53 PM View: Confidence Intervals  
 Welsh PBAP Client: Geosyntec Data: Welsh PBAP

## Memorandum

Date: January 18, 2023  
To: David Miller (AEP)  
Copies to: Jill Parker-Witt (AEP)  
From: Allison Kreinberg (Geosyntec)  
Subject: Data Quality Review – Welsh Power Plant  
October-November 2022 Sampling Event

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This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in October and 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"). 40 CFR 257 Appendix III and IV constituents were analyzed.

The following sample data groups (SDGs) were associated with the twenty-one (21) groundwater samples collected during the October and November 2022 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223477
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223481
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223483
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223484
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223509
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223510
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223511
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223515

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

The following data quality issues were identified:

- As reported in SDG 223509, chromium and cobalt were detected in the equipment blank sample “EQUIPMENT BLANK - BASP” collected on 11/1/2022. The detected chromium concentration in the equipment blank (0.53 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The detected cobalt concentration in the equipment blank (0.145 µg/L) was more than 10% of the detected value in sample AD-4C (0.757 µg/L), which could result in high bias in the AD-4C cobalt results.
- As reported in SDG 222510, barium, boron, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample “EB - Background” collected on 11/1/2022. The detected boron concentration in the equipment blank (0.01 mg/L) was more than 10% of the detected value in samples AD-5 (0.041 mg/L) and AD-17 (0.097 mg/L), which could result in high bias in the AD-5 and AD-17 boron results. Likewise, the detected chromium concentration in the equipment blank (0.52 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The detected cobalt concentration in the equipment blank (0.161 µg/L) was more than 10% of the detected value in samples AD-1 (1.17 µg/L) and “Dup-Background” (1.17 µg/L), which could result in high bias in the AD-1 and duplicate cobalt results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.
- As reported in SDG 223511, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample “EQUIPMENT BLANK – PBAP” collected on 10/31/2022. The detected chromium concentration in the equipment blank (0.53 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The estimated molybdenum concentration in the equipment blank (0.2 µg/L) was more than 10% of the estimated value in sample AD-8 (0.2 µg/L), which could result in high bias in the AD-8 molybdenum results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.

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<sup>1</sup> TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

- As reported in SDG 223513, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample “EQUIPMENT BLANK – LF” collected on 10/31/2022. The detected chromium concentration in the equipment blank (0.7 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The estimated molybdenum concentration in the equipment blank (0.3 µg/L) was more than 10% of the estimated value in samples AD-13 (0.2 µg/L) and AD-14 (0.4 µg/L), which could result in high bias in the AD-13 and AD-14 molybdenum results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.
- As reported in SDG 223510, the relative percent difference (RPD) for chromium concentrations from parent sample “AD-1” and duplicate sample “Dup Background” was 41%. The AD-1 chromium results should be considered estimated.
- As reported in SDG 223510, the RPD for radium-226 (77.1%) in the laboratory duplicate was above the acceptable limit of 25%. The “AD-1” radium-226 results should be considered estimated.
- As reported in SDG 223509, the matrix spike (MS) recovery (47.8%) and matrix spike duplicate (MSD) recovery (35.3%) for lithium were below the acceptable range of 75-125%. The associated sample (AD-3) was flagged M1: the associated MS or MSD recovery was outside acceptance limits. The AD-3 lithium 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.



## **APPENDIX 3 - NA**

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.

## **APPENDIX 4 - NA**

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

## **APPENDIX 5- NA**

Reports documenting monitoring well plugging and abandonment or well installation are included in the appendix. or other information required to be included in the annual report such as program related notification or assessment of corrective measures.

## APPENDIX 6

Field reports and analytical reports.

# CCR Groundwater Monitoring Well Inspection Form

Facility: Welsch      Sampling Period: 3-1-22  
 Sampling Contractor: Egsk      Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments
AD-14	✓	✓	✓	✓	✓	✓	
AD-11	✓	✓	✓	✓	✓	✓	
AD-16	✓	✓	✓	✓	✓	✓	DTW 20.28
AD-15	✓	✓	✓	✓	✓	✓	
AD-16R	✓	✓	✓	✓	✓	✓	DTW 27.38
AD-4A	✓	✓	✓	✓	✓	✓	DTW 16.57
AD-4	✓	✓	✓	✓	✓	✓	DTW 18.49
AD-4B	✓	✓	✓	✓	✓	✓	DTW 7.27
AD-4C	✓	✓	✓	✓	✓	✓	DTW 7.66
AD-17	✓	✓	✓	✓	✓	✓	DTW 23.18
AD-18	✓	✓	✓	✓	✓	✓	DTW 7.53
AD-22	✓	✓	✓	✓	✓	✓	DTW 10.37

**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.

AD-23      DTW 10.05

# CCR Groundwater Monitoring Well Inspection Form

Facility: AEP WELSH PP      Sampling Period: MARCH 2022  
 Sampling Contractor: AGILE ENVIRONMENTAL      Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments
AD-05	✓	✓	✓	✓	✓	✓	13.88
AD-06	✓	✓	✓	✓	✓	✓	12.85
AD-12	✓	✓	✓	✓	✓	✓	21.53
AD-01	✓	✓	✓	✓	✓	✓	17.99
AD-02	✓	✓	✓	✓	✓	✓	15.24
AD-03	✓	✓	✓	✓	✓	✓	9.30
AD-08	✓	✓	✓	✓	✓	✓	
AD-07	✓	✓	✓	✓	✓	✓	17.55
AD-09	✓	✓	✓	✓	✓	✓	
AD-13	✓	✓	✓	✓	✓	✓	

**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: APP WELSH PP

Sampling Period: JUNE 2022

Sampling Contractor: EA&T

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
AD-13	S	S	S	S	S	S	S	PART OF THE WELLS HAVE WELL HEAD, VENT TO CAP, INSIDE LABEL  DTW  13,999  18,47  18,59  9,73
AD-8	S	S	S	S	S	S	S	
AD-9	S	S	S	S	S	S	S	
AD-6	S	S	S	S	S	S	S	
AD-5	S	S	S	S	S	S	S	
AD-4	S	S	S	S	S	S	S	
AD-4A	S	S	S	S	S	S	S	
AD-4B	S	S	S	S	S	S	S	
AD-4C	S	S	S	S	S	S	S	
AD-1	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.

# CCR Groundwater Monitoring Well Inspection Form

Facility: Welsh Sampling Period: June 2022  
 Sampling Contractor: Enyc 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
AD-15	S	S	S	S	S	S	S	All wells - No weep holes - No fill - No internal label
AD-10	S	S	S	S	S	S	S	DTW - 20.03
AD-11	S	S	S	S	S	S	S	
AD-14	S	S	S	S	S	S	S	- Has fill
AD-16A	S	S	S	S	S	S	S	- Has internal label
AD-2	S	S	S	S	S	S	S	DTW - 15.60 - Has fill
AD-3	S	S	S	S	S	S	S	- No bollards
AD-7	S	S	S	S	S	S	S	DTW 17.49
AD-12	S	S	S	S	S	S	S	DTW 21.68
AD-17	S	S	S	S	S	S	S	<del>DTW 19.58</del>
AD-18	S	S	S	S	S	S	S	DTW 8.39
AD-22	N/A	N/A	N/A	U	S	U	S	DTW 10.58 - Flush M=not well

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

AD-23 N/A N/A N/A U S U S DTW 10.31

















# CCR Groundwater Monitoring Well Inspection Form

Facility: Welsh      Sampling Period: Oct 2-22  
 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-15	✓	✓	✓	✓	✓	✓	✓	
AD-16	✓	✓	✓	✓	✓	✓	✓	DTW-19.51
AD-11	✓	✓	✓	✓	✓	✓	✓	
AD-14	✓	✓	✓	✓	✓	✓	✓	
AD-16A	✓	✓	✓	✓	✓	✓	✓	
AD-7	✓	✓	✓	✓	✓	✓	✓	DTW 17.65
AD-3	✓	✓	✓	✓	✓	✓	✓	
AD-2	✓	✓	✓	✓	✓	✓	✓	DTW 15.79 no boards
AD-17	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	DTW-16.49
AD-22	✓	✓	✓	✓	✓	✓	✓	DTW 11.09
AD-23	✓	✓	✓	✓	✓	✓	✓	DTW-12.22

**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 WELSH PP Sampling Period: OCTOBER 31 - NOV 1, 2022  
 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-08	S	S	S	S	S	S	S	
AD-09	S	S	S	S	S	S	S	
AD-13	S	S	S	-	S	S	S	NEEDS VEFERATING W/REGULATION 6
AD-05	S	S	S	S	S	S	S	
AD-04C	S	S	S	S	S	S	S	
AD-04	S	S	S	S	S	S	S	17.63
AD-01	S	S	S	S	S	S	S	NEEDS VEFERATING W/REGULATION 6
AD-12	S	S	S	S	S	S	S	22.61
AD-06	S	S	S	S	S	S	S	13.69

**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.





















# Water Analysis Report

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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-8 (PBAP)

Customer Description:

Lab Number: 220714-001

Preparation:

Date Collected: 03/01/2022 10:45 EST

Date Received: 03/03/2022 11:00 EST

### Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.11	mg/L	2	0.10	0.02		CRJ	03/08/2022 02:27	EPA 300.1 -1997, Rev. 1.0
Chloride	15.9	mg/L	2	0.04	0.02		CRJ	03/08/2022 02:27	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.97	mg/L	2	0.06	0.02		CRJ	03/08/2022 02:27	EPA 300.1 -1997, Rev. 1.0
Sulfate	138	mg/L	10	2.0	0.3		CRJ	03/07/2022 21:09	EPA 300.1 -1997, Rev. 1.0

### Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Arsenic	0.27	µg/L	1	0.10	0.03		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Barium	23.6	µg/L	1	0.20	0.05		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.04	µg/L	5	0.25	0.04	U1	GES	03/14/2022 10:36	EPA 200.8-1994, Rev. 5.4
Boron	1.16	mg/L	1	0.050	0.009		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Cadmium	0.018	µg/L	1	0.020	0.004	J1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Calcium	18.7	mg/L	1	0.05	0.02		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.20	0.04		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Cobalt	5.10	µg/L	1	0.020	0.003		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Lithium	0.0654	mg/L	5	0.0010	0.0003		GES	03/14/2022 10:36	EPA 200.8-1994, Rev. 5.4
Magnesium	7.94	mg/L	1	0.10	0.02		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	Q1, U1	JAB	03/23/2022 11:38	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Potassium	4.24	mg/L	1	0.10	0.02		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Sodium	43.2	mg/L	1	0.20	0.05		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Strontium	0.194	mg/L	1	0.0020	0.0004		GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4
Thallium	0.13	µg/L	1	0.20	0.04	J1	GES	03/14/2022 09:57	EPA 200.8-1994, Rev. 5.4

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.91	pCi/L	0.19	0.23		ST	03/11/2022 11:23	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.4	%						
Radium-228	0.40	pCi/L	0.17	0.58		TTP	03/16/2022 16:21	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.4	%						

\* 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.



# Water Analysis Report

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

**Reissued**

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-8 (PBAP)

Customer Description:

Lab Number: 220714-001

Preparation:

Date Collected: 03/01/2022 10:45 EST

Date Received: 03/03/2022 11:00 EST

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	10	mg/L	1	20	5	J1	MGK	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	260	mg/L	1	50	20	P1	SDW	03/05/2022 09:35	SM 2540C-2011

Customer Sample ID: AD-9 (PBAP)

Customer Description:

Lab Number: 220714-002

Preparation:

Date Collected: 03/01/2022 11:45 EST

Date Received: 03/03/2022 11:00 EST

## 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	03/08/2022 02:53	EPA 300.1 -1997, Rev. 1.0
Chloride	18.3	mg/L	2	0.04	0.02		CRJ	03/08/2022 02:53	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	03/08/2022 02:53	EPA 300.1 -1997, Rev. 1.0
Sulfate	109	mg/L	25	5.0	0.8		CRJ	03/07/2022 21:36	EPA 300.1 -1997, Rev. 1.0



# Water Analysis Report

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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-9 (PBAP)	Customer Description:
Lab Number: 220714-002	Preparation:
Date Collected: 03/01/2022 11:45 EST	Date Received: 03/03/2022 11:00 EST

### Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Arsenic	0.24	µg/L	1	0.10	0.03		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Barium	55.3	µg/L	1	0.20	0.05		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Beryllium	1.20	µg/L	5	0.25	0.04		GES	03/14/2022 10:41	EPA 200.8-1994, Rev. 5.4
Boron	0.148	mg/L	1	0.050	0.009		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Cadmium	0.266	µg/L	1	0.020	0.004		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Calcium	12.0	mg/L	1	0.05	0.02		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Chromium	0.74	µg/L	1	0.20	0.04		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Cobalt	19.1	µg/L	1	0.020	0.003		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Lithium	0.205	mg/L	5	0.0010	0.0003		GES	03/14/2022 10:41	EPA 200.8-1994, Rev. 5.4
Magnesium	5.64	mg/L	1	0.10	0.02		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	Q1, J1	JAB	03/23/2022 11:45	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Potassium	3.05	mg/L	1	0.10	0.02		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Selenium	0.26	µg/L	1	0.50	0.09	J1	GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Sodium	41.8	mg/L	1	0.20	0.05		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Strontium	0.426	mg/L	1	0.0020	0.0004		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.22	µg/L	1	0.20	0.04		GES	03/14/2022 10:02	EPA 200.8-1994, Rev. 5.4

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.79	pCi/L	0.28	0.31		ST	03/11/2022 11:23	SW-846 9315-1986, Rev. 0
Carrier Recovery	83.1	%						
Radium-228	1.56	pCi/L	0.14	0.40		TTP	03/16/2022 16:21	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	91.3	%						

\* 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.

### Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	8	mg/L	1	20	5	J1	MGK	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	300	mg/L	1	50	20		SDW	03/05/2022 09:45	SM 2540C-2011



# Water Analysis Report

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

**Reissued**

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-11 (LF)

Customer Description:

Lab Number: 220714-003

Preparation:

Date Collected: 03/01/2022 11:45 EST

Date Received: 03/03/2022 11:00 EST

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.27	mg/L	2	0.10	0.02		CRJ	03/08/2022 03:46	EPA 300.1 -1997, Rev. 1.0
Chloride	11.5	mg/L	2	0.04	0.02		CRJ	03/08/2022 03:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.19	mg/L	2	0.06	0.02		CRJ	03/08/2022 03:46	EPA 300.1 -1997, Rev. 1.0
Sulfate	594	mg/L	25	5.0	0.8		CRJ	03/07/2022 22:02	EPA 300.1 -1997, Rev. 1.0

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Arsenic	0.84	µg/L	1	0.10	0.03		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Barium	10.5	µg/L	1	0.20	0.05		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Beryllium	2.56	µg/L	5	0.25	0.04		GES	03/14/2022 10:46	EPA 200.8-1994, Rev. 5.4
Boron	1.67	mg/L	1	0.050	0.009		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Cadmium	0.426	µg/L	1	0.020	0.004		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Calcium	10.2	mg/L	1	0.05	0.02		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Chromium	0.66	µg/L	1	0.20	0.04		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Cobalt	21.3	µg/L	1	0.020	0.003		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Lead	1.48	µg/L	1	0.20	0.05		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Lithium	0.0254	mg/L	5	0.0010	0.0003		GES	03/14/2022 10:46	EPA 200.8-1994, Rev. 5.4
Magnesium	13.2	mg/L	1	0.10	0.02		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Mercury	10	ng/L	1	5	2	Q1	JAB	03/23/2022 11:47	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Potassium	2.10	mg/L	1	0.10	0.02		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Selenium	1.89	µg/L	1	0.50	0.09		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Sodium	225	mg/L	5	1.0	0.3		GES	03/14/2022 10:46	EPA 200.8-1994, Rev. 5.4
Strontium	0.246	mg/L	1	0.0020	0.0004		GES	03/14/2022 10:07	EPA 200.8-1994, Rev. 5.4
Thallium	0.20	µg/L	1	0.20	0.04		GES	03/14/2022 10:07	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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-11 (LF)

Customer Description:

Lab Number: 220714-003

Preparation:

Date Collected: 03/01/2022 11:45 EST

Date Received: 03/03/2022 11:00 EST

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	3.24	pCi/L	0.36	0.24		ST	03/11/2022 11:23	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.9	%						
Radium-228	1.66	pCi/L	0.19	0.59	L1	TTP	03/17/2022 16:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.3	%						

\* 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.

### 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	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	900	mg/L	1	50	20		SDW	03/05/2022 09:45	SM 2540C-2011

Customer Sample ID: AD-13 (LF)

Customer Description:

Lab Number: 220714-004

Preparation:

Date Collected: 03/01/2022 12:48 EST

Date Received: 03/03/2022 11:00 EST

### 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	03/08/2022 05:05	EPA 300.1 -1997, Rev. 1.0
Chloride	11.0	mg/L	2	0.04	0.02		CRJ	03/08/2022 05:05	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.17	mg/L	2	0.06	0.02		CRJ	03/08/2022 05:05	EPA 300.1 -1997, Rev. 1.0
Sulfate	221	mg/L	10	2.0	0.3		CRJ	03/07/2022 23:22	EPA 300.1 -1997, Rev. 1.0



# Water Analysis Report

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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-13 (LF)

Customer Description:

Lab Number: 220714-004

Preparation:

Date Collected: 03/01/2022 12:48 EST

Date Received: 03/03/2022 11:00 EST

### Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Barium	12.9	µg/L	1	0.20	0.05		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Beryllium	0.67	µg/L	5	0.25	0.04		GES	03/14/2022 10:51	EPA 200.8-1994, Rev. 5.4
Boron	1.36	mg/L	1	0.050	0.009		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Cadmium	0.148	µg/L	1	0.020	0.004		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Calcium	4.98	mg/L	1	0.05	0.02		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.20	0.04		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Cobalt	6.57	µg/L	1	0.020	0.003		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Lithium	0.0305	mg/L	5	0.0010	0.0003		GES	03/14/2022 10:51	EPA 200.8-1994, Rev. 5.4
Magnesium	3.32	mg/L	1	0.10	0.02		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	Q1, J1	JAB	03/23/2022 11:49	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Potassium	2.08	mg/L	1	0.10	0.02		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Selenium	0.32	µg/L	1	0.50	0.09	J1	GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Sodium	89.7	mg/L	1	0.20	0.05		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Strontium	0.0988	mg/L	1	0.0020	0.0004		GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4
Thallium	0.16	µg/L	1	0.20	0.04	J1	GES	03/14/2022 10:12	EPA 200.8-1994, Rev. 5.4

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.69	pCi/L	0.35	0.26		ST	03/11/2022 11:23	SW-846 9315-1986, Rev. 0
Carrier Recovery	86.1	%						
Radium-228	1.18	pCi/L	0.14	0.43	L1	TTP	03/17/2022 16:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	96.5	%						

\* 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.

### 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	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	390	mg/L	1	50	20		SDW	03/05/2022 09:50	SM 2540C-2011





# Water Analysis Report

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

**Reissued**

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-14 (LF)

Customer Description:

Lab Number: 220714-005

Preparation:

Date Collected: 03/01/2022 10:47 EST

Date Received: 03/03/2022 11:00 EST

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.66	mg/L	2	0.10	0.02		CRJ	03/08/2022 05:32	EPA 300.1 -1997, Rev. 1.0
Chloride	9.34	mg/L	2	0.04	0.02		CRJ	03/08/2022 05:32	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.28	mg/L	2	0.06	0.02		CRJ	03/08/2022 05:32	EPA 300.1 -1997, Rev. 1.0
Sulfate	241	mg/L	10	2.0	0.3		CRJ	03/07/2022 23:48	EPA 300.1 -1997, Rev. 1.0

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Arsenic	0.42	µg/L	1	0.10	0.03		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Barium	21.9	µg/L	1	0.20	0.05		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Beryllium	1.60	µg/L	5	0.25	0.04		GES	03/14/2022 10:57	EPA 200.8-1994, Rev. 5.4
Boron	1.08	mg/L	1	0.050	0.009		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Cadmium	3.34	µg/L	1	0.020	0.004		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Calcium	8.58	mg/L	1	0.05	0.02		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Chromium	0.57	µg/L	1	0.20	0.04		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Cobalt	26.7	µg/L	1	0.020	0.003		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Lead	0.35	µg/L	1	0.20	0.05		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Lithium	0.0180	mg/L	5	0.0010	0.0003		GES	03/14/2022 10:57	EPA 200.8-1994, Rev. 5.4
Magnesium	6.82	mg/L	1	0.10	0.02		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Mercury	500	ng/L	100	500	200	Q1	JAB	03/29/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Potassium	1.58	mg/L	1	0.10	0.02		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Selenium	2.22	µg/L	1	0.50	0.09		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Sodium	95.3	mg/L	1	0.20	0.05		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Strontium	0.195	mg/L	1	0.0020	0.0004		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4
Thallium	0.30	µg/L	1	0.20	0.04		GES	03/14/2022 10:20	EPA 200.8-1994, Rev. 5.4





# Water Analysis Report

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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-14 (LF)	Customer Description:
Lab Number: 220714-005	Preparation:
Date Collected: 03/01/2022 10:47 EST	Date Received: 03/03/2022 11:00 EST

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	4.10	pCi/L	0.43	0.27		ST	03/11/2022 11:23	SW-846 9315-1986, Rev. 0
Carrier Recovery	79.4	%						
Radium-228	1.96	pCi/L	0.19	0.55	L1	TTP	03/17/2022 16:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.0	%						

\* 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.

### 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	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	440	mg/L	1	50	20		SDW	03/05/2022 09:50	SM 2540C-2011

Customer Sample ID: AD-15 (PBAP)	Customer Description:
Lab Number: 220714-006	Preparation:
Date Collected: 03/01/2022 12:33 EST	Date Received: 03/03/2022 11:00 EST

### Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.89	mg/L	2	0.10	0.02		CRJ	03/07/2022 20:17	EPA 300.1 -1997, Rev. 1.0
Chloride	25.0	mg/L	2	0.04	0.02		CRJ	03/07/2022 20:17	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	03/07/2022 20:17	EPA 300.1 -1997, Rev. 1.0
Sulfate	4.29	mg/L	2	0.40	0.06		CRJ	03/07/2022 20:17	EPA 300.1 -1997, Rev. 1.0



# Water Analysis Report

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

## Reissued

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-15 (PBAP)

Customer Description:

Lab Number: 220714-006

Preparation:

Date Collected: 03/01/2022 12:33 EST

Date Received: 03/03/2022 11:00 EST

### Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Arsenic	1.89	µg/L	1	0.10	0.03		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Barium	75.1	µg/L	1	0.20	0.05		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Beryllium	0.207	µg/L	1	0.050	0.007		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Boron	0.076	mg/L	1	0.050	0.009		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Calcium	2.63	mg/L	1	0.05	0.02		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Chromium	0.55	µg/L	1	0.20	0.04		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Cobalt	2.76	µg/L	1	0.020	0.003		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Lithium	0.00208	mg/L	1	0.00020	0.00005		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Magnesium	3.27	mg/L	1	0.10	0.02		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	Q1, J1	JAB	03/23/2022 11:42	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Potassium	0.54	mg/L	1	0.10	0.02		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Selenium	0.29	µg/L	1	0.50	0.09	J1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Sodium	16.6	mg/L	1	0.20	0.05		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Strontium	0.0359	mg/L	1	0.0020	0.0004		GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	03/14/2022 12:02	EPA 200.8-1994, Rev. 5.4

### Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.61	pCi/L	0.32	0.39		ST	03/11/2022 15:29	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.9	%						
Radium-228	0.40	pCi/L	0.14	0.48	L1	TTP	03/17/2022 16:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	81.6	%						

\* 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.

### Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	25	mg/L	1	20	5		MGK	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	80	mg/L	1	50	20		SDW	03/05/2022 09:58	SM 2540C-2011



# Water Analysis Report

Reissued

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

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: Duplicate

Customer Description:

Lab Number: 220714-007

Preparation:

Date Collected: 03/01/2022 11:59 EST

Date Received: 03/03/2022 11:00 EST

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.66	mg/L	2	0.10	0.02		CRJ	03/08/2022 04:12	EPA 300.1 -1997, Rev. 1.0
Chloride	9.37	mg/L	2	0.04	0.02		CRJ	03/08/2022 04:12	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.28	mg/L	2	0.06	0.02		CRJ	03/08/2022 04:12	EPA 300.1 -1997, Rev. 1.0
Sulfate	255	mg/L	25	5.0	0.8		CRJ	03/07/2022 22:29	EPA 300.1 -1997, Rev. 1.0

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Arsenic	0.41	µg/L	1	0.10	0.03		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Barium	21.9	µg/L	1	0.20	0.05		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Beryllium	1.68	µg/L	5	0.25	0.04		GES	03/14/2022 12:59	EPA 200.8-1994, Rev. 5.4
Boron	1.09	mg/L	1	0.050	0.009		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Cadmium	3.32	µg/L	1	0.020	0.004		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Calcium	8.67	mg/L	1	0.05	0.02		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Chromium	0.66	µg/L	1	0.20	0.04		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Cobalt	26.6	µg/L	1	0.020	0.003		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Lead	0.36	µg/L	1	0.20	0.05		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Lithium	0.0190	mg/L	5	0.0010	0.0003		GES	03/14/2022 12:59	EPA 200.8-1994, Rev. 5.4
Magnesium	6.91	mg/L	1	0.10	0.02		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Mercury	500	ng/L	100	500	200	Q1	JAB	03/29/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Potassium	1.62	mg/L	1	0.10	0.02		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Selenium	2.16	µg/L	1	0.50	0.09		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Sodium	96.3	mg/L	1	0.20	0.05		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Strontium	0.195	mg/L	1	0.0020	0.0004		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4
Thallium	0.29	µg/L	1	0.20	0.04		GES	03/14/2022 12:07	EPA 200.8-1994, Rev. 5.4

## 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	03/04/2022 11:00	SM 2320B-2011
TDS, Filterable Residue	440	mg/L	1	50	20		SDW	03/05/2022 09:58	SM 2540C-2011



# Water Analysis Report

## Reissued

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

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: Equipment Blank

Customer Description:

Lab Number: 220714-008

Preparation:

Date Collected: 03/01/2022 12:18 EST

Date Received: 03/03/2022 11:00 EST

### Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Barium	0.05	µg/L	1	0.20	0.05	J1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.20	0.04		GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Cobalt	0.011	µg/L	1	0.020	0.003	J1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00005	mg/L	1	0.00020	0.00005	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.02	mg/L	1	0.10	0.02	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	Q1, U1	JAB	03/23/2022 11:58	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Potassium	<0.02	mg/L	1	0.10	0.02	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Sodium	<0.05	mg/L	1	0.20	0.05	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Strontium	<0.0004	mg/L	1	0.0020	0.0004	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	03/14/2022 12:13	EPA 200.8-1994, Rev. 5.4

220714

Job Comments:

Original report issued 4/1/22. Report reissued 5/10/22. Report reissued with amended matrix spike precision calculations.



## Water Analysis Report

Reissued

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

Job ID: 220714

Customer: Welsh Power Station

Date Reported: 12/27/2022

### 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**

### Data Qualifier 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.

Q1 - Sample was received in inappropriate sample container.

P1 - The precision between duplicate results was above acceptance limits.

L1 - The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_

COC/Order #: \_\_\_\_\_

For Lab Use Only:

220714

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Jonathan Barnhill (318-673-3803)  
 Contacts: Michael Ohlinger (614-838-4184)

Project Name: Welsh Annual Screening  
 Contact Name: Jill Parker-Witt  
 Contact Phone: (318) 673-3816

Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials					Field-filter 500 mL bottle, than pH<2, HNO <sub>3</sub>	250 mL bottle, pH<2, HNO <sub>3</sub>	1 L bottle, Cool, 0-8°C	Three (six every 10th) 1 L bottles, pH<2, HNO <sub>3</sub>	125 mL PTFE lined bottle, HCL, pH<2	Sample Specific Notes
						B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl, and Na, K, Mg, Sr	dissolved Fe and Mn	TDS, F, Cl, SO <sub>4</sub> , and Br, Alkalinity	Ra-226, Ra-228	Hg						
AD-8 (PBAP)	3/1/2022	945	G	GW	5					X		X				
AD-9 (PBAP)	3/1/2022	1045	G	GW	5					X		X				
AD-11 (LF)	3/1/2022	1045	G	GW	5					X		X				
AD-13 (LF)	3/1/2022	1148	G	GW	5					X		X				
AD-14 (LF)	3/1/2022	947	G	GW	8					X		X				
AD-15 (PBAP)	3/1/2022	1133	G	GW	5					X		X				
DUPLICATE	3/1/2022	1059	G	GW	2					X		X				
EQUIPMENT BLANK	3/1/2022	1118	G		1					X						
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other; F= filter in field																
* Six 1L Bottles must be collected for Radium for every 10th sample.																

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>Michael Ohlinger</i>	Company: Eagle	Date/Time: 3/2/22 1530	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>Michael Ohlinger</i>	Date/Time: 3/3/22 11:00 AM

**AEP WATER & WASTE SAMPLE RECEIPT FORM (IR#1)**

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEx	<input type="radio"/> USPS
				Other _____			
Plant/Customer <u>Welsh PS</u>			Number of Plastic Containers: <u>20</u>				
Opened By <u>MSO</u>			Number of Glass Containers: <u>✓</u>				
Date/Time <u>3/7/22 12:30PM</u>			Number of Mercury Containers: <u>✓</u>				
Were all temperatures within 0-6°C? Y/N or N/A Initial: _____ on ice / <input checked="" type="radio"/> no ice							
(IR Gun Ser# 210441568, Expir. 5/27/2023) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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 3/7/22

pH paper (circle one): MQuant pH Cat 1.09535.0001 \_\_\_\_\_ [OR] Lab rat pH Cat # LRS -4801   
lot HC904495 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# 220714 Initial & Date & Time : \_\_\_\_\_

Comments: 2nd half of shipment

Logged by MSO \_\_\_\_\_

Reviewed by GAB \_\_\_\_\_

**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

**Reissued**

Job ID: 222057

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: AD-1

Customer Description: TG-32

Lab Number: 222057-001

Preparation:

Date Collected: 06/28/2022 12:35 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.32	mg/L	2	0.04	0.02		CRJ	07/13/2022 00:06	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	2	0.06	0.02		CRJ	07/13/2022 00:06	EPA 300.1 -1997, Rev. 1.0
Sulfate	74.7	mg/L	2	0.40	0.06		CRJ	07/13/2022 00:06	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	180	mg/L	1	50	20		SDW	07/01/2022 14:30	SM 2540C-2015

Customer Sample ID: AD-5

Customer Description: TG-32

Lab Number: 222057-002

Preparation:

Date Collected: 06/28/2022 10:05 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	15.3	mg/L	2	0.04	0.02		CRJ	07/12/2022 23:13	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	07/12/2022 23:13	EPA 300.1 -1997, Rev. 1.0
Sulfate	146	mg/L	10	2.0	0.3		CRJ	07/12/2022 22:47	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	310	mg/L	2	100	40		SDW	07/01/2022 14:38	SM 2540C-2015

Customer Sample ID: AD-17

Customer Description: TG-32

Lab Number: 222057-003

Preparation:

Date Collected: 06/28/2022 13:29 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	37.0	mg/L	5	0.10	0.05		CRJ	07/12/2022 21:54	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	5	0.15	0.05	J1	CRJ	07/12/2022 21:54	EPA 300.1 -1997, Rev. 1.0
Sulfate	1050	mg/L	50	10	2		CRJ	07/12/2022 21:28	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1740	mg/L	2	100	40		SDW	07/01/2022 14:48	SM 2540C-2015





# Water Analysis Report

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

**Reissued**

Job ID: 222057

Customer: Welsh Power Station

Date Reported: 12/27/2022

Customer Sample ID: DUPLICATE - BACKGROUND	Customer Description: TG-32
Lab Number: 222057-004	Preparation:
Date Collected: 06/28/2022 15:30 EDT	Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.25	mg/L	2	0.04	0.02		CRJ	07/12/2022 21:01	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	2	0.06	0.02		CRJ	07/12/2022 21:01	EPA 300.1 -1997, Rev. 1.0
Sulfate	73.0	mg/L	2	0.40	0.06		CRJ	07/12/2022 21:01	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	180	mg/L	1	50	20		SDW	07/01/2022 14:50	SM 2540C-2015

222057

Job Comments:

Original report issued 8/9/2022. Report reissued with amended matrix spike precision calculations.

## 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**



## Water Analysis Report

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

**Reissued**

Job ID: 222057

Customer: Welsh Power Station

Date Reported: **12/27/2022**

### Data Qualifier Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.





# WATER & WASTE SAMPLE RECEIPT FORM (IR#1)

Package Type			Delivery Type				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input type="radio"/> FedEx	<input type="radio"/> USPS
				Other _____			

Plant/Customer Welsh Number of Plastic Containers: 4

Opened By Misgina/Michael Number of Glass Containers: \_\_\_\_\_

Date/Time 06/30/22 10:30 Number of Mercury Containers: \_\_\_\_\_

Were all temperatures within 0-6°C?  Y /  N or N/A Initial: mbk  (on ice) / no ice  
 (IR Gun Ser# 210441568, Expir. 5/27/2023) - 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<sup>6+</sup> (pres)      NO<sub>2</sub> or NO<sub>3</sub> (48 hr)      ortho-PO<sub>4</sub> (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: mbk 06/30/22

pH paper (circle one): MQuant pH Cat 1.09535.0001 lot HC904495 [OR] Lab rat pH Cat # LRS -4801 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# 222057 Initial & Date & Time : \_\_\_\_\_

Logged by MSO Comments: \_\_\_\_\_

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.

# Ion Chromatography Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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 E. Arnold

Name (printed)



Signature

Chemist Principle

Official Title

7/13/2022

Date

## Ion Chromatography Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Wesh Background  
**Reviewer Name:** Timothy E. Arnold  
**LRC Date:** 7/13/2022  
**Laboratory Job Number:** 222057  
**Prep Batch Number(s):** QC2207091

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Ion Chromatography Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** Wesh Background  
**Reviewer Name:** Timothy E. Arnold  
**LRC Date:** 7/13/2022  
**Laboratory Job Number:** 222057  
**Prep Batch Number(s):** QC2207091

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# TDS Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

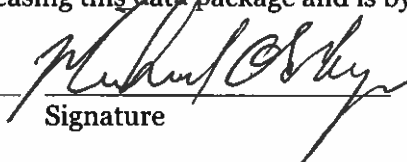
- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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

Name (printed)



Signature

chemist

Official Title

8/9/22

Date

## TDS Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Background  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 8/9/22  
**Laboratory Job Number:** 222057  
**Prep Batch Number(s):** QC2207067

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## TDS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## TDS Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Background  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 4/5/22  
**Laboratory Job Number:** 222057  
**Prep Batch Number(s):** QC2207067

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	







# Water Analysis Report

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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: AD-1

Customer Description: TG-32

Lab Number: 222084-001

Preparation:

Date Collected: 06/28/2022 12:35 EDT

Date Received: 07/01/2022 11:00 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.03	µg/L	1	0.10	0.02	J1	GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Arsenic	0.26	µg/L	1	0.10	0.03		GES	07/22/2022 08:56	EPA 200.8-1994, Rev. 5.4
Barium	85.4	µg/L	1	0.20	0.05		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Beryllium	0.995	µg/L	1	0.050	0.007		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Boron	0.768	mg/L	1	0.050	0.009		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Cadmium	0.030	µg/L	1	0.020	0.004		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Calcium	6.76	mg/L	1	0.05	0.02		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Chromium	0.37	µg/L	1	0.20	0.04		GES	07/22/2022 08:56	EPA 200.8-1994, Rev. 5.4
Cobalt	2.34	µg/L	1	0.020	0.003		GES	07/22/2022 08:56	EPA 200.8-1994, Rev. 5.4
Lead	0.33	µg/L	1	0.20	0.05		GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Lithium	0.00855	mg/L	1	0.00020	0.00005		GES	07/22/2022 08:56	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	07/19/2022 15:04	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4
Selenium	8.35	µg/L	1	0.50	0.09		GES	07/22/2022 08:56	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	07/14/2022 15:13	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	3.03	pCi/L	0.47	0.44		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	91.8	%						
Radium-228	0.66	pCi/L	0.16	0.51		TTP	07/12/2022 16:41	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.7	%						

\* 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.



# Water Analysis Report

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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: AD-5

Customer Description: TG-32

Lab Number: 222084-002

Preparation:

Date Collected: 06/28/2022 10:05 EDT

Date Received: 07/01/2022 11:00 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Arsenic	3.01	µg/L	1	0.10	0.03		GES	07/22/2022 09:01	EPA 200.8-1994, Rev. 5.4
Barium	51.8	µg/L	1	0.20	0.05		GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Beryllium	0.032	µg/L	1	0.050	0.007	J1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Boron	0.048	mg/L	1	0.050	0.009	J1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Calcium	32.9	mg/L	1	0.05	0.02		GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Chromium	0.22	µg/L	1	0.20	0.04		GES	07/22/2022 09:01	EPA 200.8-1994, Rev. 5.4
Cobalt	12.8	µg/L	1	0.020	0.003		GES	07/22/2022 09:01	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Lithium	0.161	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:01	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 15:07	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.1	µg/L	1	0.5	0.1	J1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	07/22/2022 09:01	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	07/14/2022 15:28	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.06	pCi/L	0.38	0.47		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.0	%						
Radium-228	-0.10	pCi/L	0.33	1.12		TTP	07/12/2022 16:41	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.1	%						

\* 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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: AD-17

Customer Description: TG-32

Lab Number: 222084-003

Preparation:

Date Collected: 06/28/2022 13:29 EDT

Date Received: 07/01/2022 11:00 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Arsenic	0.53	µg/L	1	0.10	0.03		GES	07/22/2022 09:11	EPA 200.8-1994, Rev. 5.4
Barium	12.6	µg/L	1	0.20	0.05		GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Beryllium	0.040	µg/L	1	0.050	0.007	J1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Boron	0.112	mg/L	1	0.050	0.009		GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Calcium	167	mg/L	1	0.05	0.02		GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.20	0.04		GES	07/22/2022 09:11	EPA 200.8-1994, Rev. 5.4
Cobalt	41.3	µg/L	1	0.020	0.003		GES	07/22/2022 09:11	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Lithium	0.267	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:11	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.1	µg/L	1	0.5	0.1	J1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	07/22/2022 09:11	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	07/14/2022 15:33	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	5.26	pCi/L	0.59	0.39		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	98.4	%						
Radium-228	1.28	pCi/L	0.15	0.45		TTP	07/12/2022 16:41	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	92.1	%						

\* 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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: DUPLICATE - BACKGROUND

Customer Description: TG-32

Lab Number: 222084-004

Preparation:

Date Collected: 06/28/2022 15:30 EDT

Date Received: 07/01/2022 11:00 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.03	µg/L	1	0.10	0.02	J1	GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.26	µg/L	1	0.10	0.03		GES	07/22/2022 09:21	EPA 200.8-1994, Rev. 5.4
Barium	82.3	µg/L	1	0.20	0.05		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Beryllium	0.852	µg/L	1	0.050	0.007		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Boron	0.779	mg/L	1	0.050	0.009		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.032	µg/L	1	0.020	0.004		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Calcium	6.56	mg/L	1	0.05	0.02		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.20	0.04		GES	07/22/2022 09:21	EPA 200.8-1994, Rev. 5.4
Cobalt	2.35	µg/L	1	0.020	0.003		GES	07/22/2022 09:21	EPA 200.8-1994, Rev. 5.4
Lead	0.38	µg/L	1	0.20	0.05		GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Lithium	0.00837	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:21	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 15:43	EPA 200.8-1994, Rev. 5.4
Selenium	7.92	µg/L	1	0.50	0.09		GES	07/22/2022 09:21	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.04	J1	GES	07/14/2022 15:43	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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: EQ BLANK - BACKGROUND

Customer Description: TG-32

Lab Number: 222084-005

Preparation:

Date Collected: 06/28/2022 12:09 EDT

Date Received: 07/01/2022 11:00 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	07/22/2022 09:26	EPA 200.8-1994, Rev. 5.4
Barium	0.06	µg/L	1	0.20	0.05	J1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Boron	0.027	mg/L	1	0.050	0.009	J1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.84	µg/L	1	0.20	0.04		GES	07/22/2022 09:26	EPA 200.8-1994, Rev. 5.4
Cobalt	0.009	µg/L	1	0.020	0.003	J1	GES	07/22/2022 09:26	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Lithium	0.00008	mg/L	1	0.00020	0.00005	J1	GES	07/22/2022 09:26	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	07/22/2022 09:26	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	07/14/2022 15:48	EPA 200.8-1994, Rev. 5.4

222084

Job Comments:

Original report issued 8/10/2022. Report reissued with amended matrix spike precision calculations.



## Water Analysis Report

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

**Reissued**

Job ID: 222084

Customer: Welsh Power Station

Date Reported: 12/29/2022

### 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**

### Data Qualifier 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).







# Mercury Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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      Chemist      7-21-22  
Name (printed)      Signature      Official Title      Date

## Mercury Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 7-21-22  
**Laboratory Job Number:** 222084  
**Prep Batch Number(s):** PB22070806

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Mercury Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## Mercury Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 7-21-22  
**Laboratory Job Number:** 222084  
**Prep Batch Number(s):** PB22070806

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# ICP-MS Laboratory Review Checklist

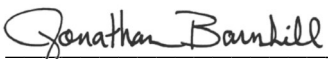
## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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.

<u>Jonathan Barnhill</u>	<u></u>	<u>Lab Supervisor</u>	<u>8-2-2022</u>
Name (printed)	Signature	Official Title	Date

# ICP-MS Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** \_\_\_\_\_

**Project Name:** \_\_\_\_\_

**Reviewer Name:** \_\_\_\_\_

**LRC Date:** \_\_\_\_\_

**Laboratory Job Number:** \_\_\_\_\_

**Prep Batch Number(s):** \_\_\_\_\_

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		
		Were all departures from standard conditions described in an exception report?		
R2	O, I	<b>Sample and quality control (QC) identification</b>		
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?		
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?		
R3	O, I	<b>Test reports</b>		
		Were all samples prepared and analyzed within holding times?		
		Other than those results < MQL, were all other raw values bracketed by calibration standards?		
		Were calculations checked by a peer or supervisor?		
		Were all analyte identifications checked by a peer or supervisor?		
		Were sample quantitation limits reported for all analytes not detected?		
		Were all results for soil and sediment samples reported on a dry weight basis?		
		Was % moisture (or solids) reported for all soil and sediment samples?		
		If required for the project, TICs reported?		
R4	O	<b>Surrogate recovery data</b>		
		Were surrogates added prior to extraction?		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		
R5	O, I	<b>Test reports/summary forms for blank samples</b>		
		Were appropriate type(s) of blanks analyzed?		
		Were blanks analyzed at the appropriate frequency?		



## ICP-MS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?		
		Were blank concentrations < MQL?		
R6	O, I	<b>Laboratory control samples (LCS):</b>		
		Were all COCs included in the LCS?		
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?		
		Were LCSs analyzed at the required frequency?		
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?		
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?		
		Was the LCSD RPD within QC limits?		
R7	O, I	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
		Were the project/method specified analytes included in the MS and MSD?		
		Were MS/MSD analyzed at the appropriate frequency?		
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		
		Were MS/MSD RPDs within laboratory QC limits?		
R8	O, I	<b>Analytical duplicate data</b>		
		Were appropriate analytical duplicates analyzed for each matrix?		
		Were analytical duplicates analyzed at the appropriate frequency?		
		Were RPDs or relative standard deviations within the laboratory QC limits?		
R9	O, I	<b>Method quantitation limits (MQLs):</b>		
		Are the MQLs for each method analyte included in the laboratory data package?		
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?		
		Are unadjusted MQLs included in the laboratory data package?		
R10	O, I	<b>Other problems/anomalies</b>		
		Are all known problems/anomalies/special conditions noted in this LRC and ER?		
		Were all necessary corrective actions performed for the reported data?		
		Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?		

## ICP-MS Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** \_\_\_\_\_

**Project Name:** \_\_\_\_\_

**Reviewer Name:** \_\_\_\_\_

**LRC Date:** \_\_\_\_\_

**Laboratory Job Number:** \_\_\_\_\_

**Prep Batch Number(s):** \_\_\_\_\_

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
		Were response factors and/or relative response factors for each analyte within QC limits?		
		Were percent RSDs or correlation coefficient criteria met?		
		Was the number of standards recommended in the method used for all analytes?		
		Were all points generated between the lowest and highest standard used to calculate the curve?		
		Are ICAL data available for all instruments used?		
		Has the initial calibration curve been verified using an appropriate second source standard?		
S2	O, I	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
		Was the CCV analyzed at the method-required frequency?		
		Were percent differences for each analyte within the method-required QC limits?		
		Was the ICAL curve verified for each analyte?		
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		
S3	O	<b>Mass spectral tuning:</b>		
		Was the appropriate compound for the method used for tuning?		
		Were ion abundance data within the method-required QC limits?		
S4	O	<b>Internal standards (IS):</b>		
		Were IS area counts and retention times within the method-required QC limits?		
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?		
		Were data associated with manual integrations flagged on the raw data?		

## ICP-MS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
		Did dual column confirmation results meet the method-required QC?		
S7	O	<b>Tentatively identified compounds (TICs):</b>		
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?		
S8	I	<b>Interference Check Sample (ICS) results:</b>		
		Were percent recoveries within method QC limits?		
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		
S10	O, I	<b>Method detection limit (MDL) studies</b>		
		Was a MDL study performed for each reported analyte?		
		Is the MDL either adjusted or supported by the analysis of DCSs?		
S11	O, I	<b>Proficiency test reports:</b>		
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?		
S12	O, I	<b>Standards documentation</b>		
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?		
S13	O, I	<b>Compound/analyte identification procedures</b>		
		Are the procedures for compound/analyte identification documented?		
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
		Was DOC conducted consistent with NELAC Chapter 5C?		
		Is documentation of the analyst's competency up-to-date and on file?		
S15	O, I	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
		Are all the methods used to generate the data documented, verified, and validated, where applicable?		
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
		Are laboratory SOPs current and on file for each method performed?		





# Water Analysis Report

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

**Reissued**

Job ID: 222059

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: AD-8

Customer Description: TG-32

Lab Number: 222059-001

Preparation:

Date Collected: 06/27/2022 11:23 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	15.9	mg/L	2	0.04	0.02		CRJ	07/13/2022 17:51	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.82	mg/L	2	0.06	0.02		CRJ	07/13/2022 17:51	EPA 300.1 -1997, Rev. 1.0
Sulfate	156	mg/L	10	2.0	0.3		CRJ	07/13/2022 17:25	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	330	mg/L	1	50	20		SDW	07/01/2022 14:59	SM 2540C-2015

Customer Sample ID: AD-9

Customer Description: TG-32

Lab Number: 222059-002

Preparation:

Date Collected: 06/27/2022 12:20 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	59.8	mg/L	5	0.10	0.05		CRJ	07/13/2022 19:11	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	5	0.15	0.05	J1	CRJ	07/13/2022 19:11	EPA 300.1 -1997, Rev. 1.0
Sulfate	933	mg/L	50	10	2		CRJ	07/13/2022 18:44	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1460	mg/L	2	100	40		SDW	07/01/2022 15:01	SM 2540C-2015

Customer Sample ID: AD-15

Customer Description: TG-32

Lab Number: 222059-003

Preparation:

Date Collected: 06/27/2022 11:07 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	30.9	mg/L	2	0.04	0.02		CRJ	07/13/2022 20:30	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	07/13/2022 20:30	EPA 300.1 -1997, Rev. 1.0
Sulfate	18.9	mg/L	2	0.40	0.06		CRJ	07/13/2022 20:30	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		SDW	07/01/2022 15:05	SM 2540C-2015



# Water Analysis Report

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

**Reissued**

Job ID: 222059

Customer: Welsh Power Station

Date Reported: 12/29/2022

Customer Sample ID: DUPLICATE - PBAP

Customer Description: TG-32

Lab Number: 222059-004

Preparation:

Date Collected: 06/27/2022 14:00 EDT

Date Received: 06/30/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	30.4	mg/L	2	0.04	0.02		CRJ	07/13/2022 20:03	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	07/13/2022 20:03	EPA 300.1 -1997, Rev. 1.0
Sulfate	17.6	mg/L	2	0.40	0.06		CRJ	07/13/2022 20:03	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	160	mg/L	1	50	20		SDW	07/01/2022 15:10	SM 2540C-2015

222059

Job Comments:

Original report issued 8/2/2022. Report reissued with amended matrix spike precision calculations.

## 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**



## Water Analysis Report

**Reissued**

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

**Job ID: 222059**

**Customer: Welsh Power Station**

**Date Reported: 12/29/2022**

### Data Qualifier Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.





WATER & WASTE SAMPLE RECEIPT FORM (IR#1)

<p><u>Package Type</u></p> <p><input checked="" type="radio"/> Cooler    <input type="radio"/> Box    <input type="radio"/> Bag    <input type="radio"/> Envelope</p>	<p><u>Delivery Type</u></p> <p><input type="radio"/> PONY    <input type="radio"/> UPS    <input type="radio"/> FedEx    <input type="radio"/> USPS</p> <p>Other _____</p>			
Plant/Customer <u>WELSH</u>	Number of Plastic Containers: <u>4</u>			
Opened By <u>Misgira/Michael</u>	Number of Glass Containers: _____			
Date/Time <u>06/30/22 10:30</u>	Number of Mercury Containers: _____			
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or N/A Initial: <u>mbk</u> <input checked="" type="radio"/> on ice / <input type="radio"/> no ice (IR Gun Ser# 210441568, Expir. 5/27/2023) - If No, specify each deviation: _____				
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____				
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____				
pH (15 min)	Cr <sup>6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: mbk 06/30/22

pH paper (circle one): MQuant pH Cat 1.09535.0001 \_\_\_\_\_ (OR) Lab rat pH Cat # LRS -4801   
lot HC904495 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# 222059 Initial & Date & Time : \_\_\_\_\_

Logged by MSO Comments: \_\_\_\_\_

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.

# TDS Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

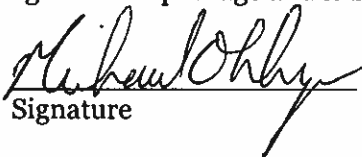
- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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

Name (printed)



Signature

Chemist

Official Title

8/2/22

Date

## TDS Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh PBAP  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 8/2/22  
**Laboratory Job Number:** 222059  
**Prep Batch Number(s):** QC2207067

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## TDS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## TDS Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh PBAP  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 4/5/22  
**Laboratory Job Number:** 222059  
**Prep Batch Number(s):** QC2207067

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# Ion Chromatography Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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 E. Arnold

  
Signature

Chemist Principle

07/14/2022

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:** Welsh PBAP  
**Reviewer Name:** Timothy E. Arnold  
**LRC Date:** 07/14/2022  
**Laboratory Job Number:** 222059  
**Prep Batch Number(s):** QC2207097

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Ion Chromatography Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** Welsh PBAP

**Reviewer Name:** Timothy E. Arnold

**LRC Date:** 07/14/2022

**Laboratory Job Number:** 222059

**Prep Batch Number(s):** QC2207097

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	





# Water Analysis Report

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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: AD-8

Customer Description:

Lab Number: 222085-001

Preparation:

Date Collected: 06/27/2022 11:23 EDT

Date Received: 07/01/2022 10:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Arsenic	0.25	µg/L	1	0.10	0.03		GES	07/22/2022 09:31	EPA 200.8-1994, Rev. 5.4
Barium	26.1	µg/L	1	0.20	0.05		GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Boron	1.15	mg/L	1	0.050	0.009		GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Cadmium	0.018	µg/L	1	0.020	0.004	J1	GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Calcium	19.5	mg/L	1	0.05	0.02		GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.41	µg/L	1	0.20	0.04		GES	07/22/2022 09:31	EPA 200.8-1994, Rev. 5.4
Cobalt	3.15	µg/L	1	0.020	0.003		GES	07/22/2022 09:31	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.0777	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:31	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 15:53	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	07/22/2022 09:31	EPA 200.8-1994, Rev. 5.4
Thallium	0.11	µg/L	1	0.20	0.04	J1	GES	07/14/2022 15:53	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	0.29	0.43		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.2	%						
Radium-228	0.14	pCi/L	0.13	0.43		TTP	07/12/2022 16:41	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	82.8	%						

\* 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.



# Water Analysis Report

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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: AD-9

Customer Description:

Lab Number: 222085-002

Preparation:

Date Collected: 06/27/2022 12:20 EDT

Date Received: 07/01/2022 10:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Arsenic	0.87	µg/L	1	0.10	0.03		GES	07/22/2022 09:47	EPA 200.8-1994, Rev. 5.4
Barium	49.7	µg/L	1	0.20	0.05		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Beryllium	0.780	µg/L	1	0.050	0.007		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Boron	0.174	mg/L	1	0.050	0.009		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Cadmium	0.244	µg/L	1	0.020	0.004		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Calcium	109	mg/L	1	0.05	0.02		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Chromium	0.59	µg/L	1	0.20	0.04		GES	07/22/2022 09:47	EPA 200.8-1994, Rev. 5.4
Cobalt	19.5	µg/L	1	0.020	0.003		GES	07/22/2022 09:47	EPA 200.8-1994, Rev. 5.4
Lead	0.27	µg/L	1	0.20	0.05		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Lithium	0.539	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:47	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4
Selenium	0.46	µg/L	1	0.50	0.09	J1	GES	07/22/2022 09:47	EPA 200.8-1994, Rev. 5.4
Thallium	0.22	µg/L	1	0.20	0.04		GES	07/14/2022 15:59	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.09	pCi/L	0.37	0.50		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	97.8	%						
Radium-228	1.43	pCi/L	0.14	0.41		TTP	07/20/2022 15:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	93.5	%						

\* 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.



# Water Analysis Report

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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: AD-15

Customer Description:

Lab Number: 222085-003

Preparation:

Date Collected: 06/27/2022 11:07 EDT

Date Received: 07/01/2022 10:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Arsenic	3.03	µg/L	1	0.10	0.03		GES	07/22/2022 09:57	EPA 200.8-1994, Rev. 5.4
Barium	78.5	µg/L	1	0.20	0.05		GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Beryllium	0.088	µg/L	1	0.050	0.007		GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Boron	0.329	mg/L	1	0.050	0.009		GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Cadmium	0.015	µg/L	1	0.020	0.004	J1	GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Calcium	3.25	mg/L	1	0.05	0.02		GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.20	0.04		GES	07/22/2022 09:57	EPA 200.8-1994, Rev. 5.4
Cobalt	3.54	µg/L	1	0.020	0.003		GES	07/22/2022 09:57	EPA 200.8-1994, Rev. 5.4
Lead	0.05	µg/L	1	0.20	0.05	J1	GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Lithium	0.00573	mg/L	1	0.00020	0.00005		GES	07/22/2022 09:57	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4
Selenium	0.63	µg/L	1	0.50	0.09		GES	07/22/2022 09:57	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.04	J1	GES	07/14/2022 16:04	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.07	pCi/L	0.37	0.38		ST	07/07/2022 14:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.7	%						
Radium-228	0.08	pCi/L	0.14	0.46		TTP	07/20/2022 15:35	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	94.6	%						

\* 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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: DUPLICATE - PBAP

Customer Description:

Lab Number: 222085-004

Preparation:

Date Collected: 06/27/2022 14:00 EDT

Date Received: 07/01/2022 10:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Arsenic	3.12	µg/L	1	0.10	0.03		GES	07/22/2022 10:02	EPA 200.8-1994, Rev. 5.4
Barium	77.1	µg/L	1	0.20	0.05		GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Beryllium	0.096	µg/L	1	0.050	0.007		GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Boron	0.323	mg/L	1	0.050	0.009		GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Calcium	3.20	mg/L	1	0.05	0.02		GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.29	µg/L	1	0.20	0.04		GES	07/22/2022 10:02	EPA 200.8-1994, Rev. 5.4
Cobalt	3.63	µg/L	1	0.020	0.003		GES	07/22/2022 10:02	EPA 200.8-1994, Rev. 5.4
Lead	0.05	µg/L	1	0.20	0.05	J1	GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.00561	mg/L	1	0.00020	0.00005		GES	07/22/2022 10:02	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 16:09	EPA 200.8-1994, Rev. 5.4
Selenium	0.67	µg/L	1	0.50	0.09		GES	07/22/2022 10:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.04	J1	GES	07/14/2022 16:09	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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: EQUIPMENT BLANK - PBAP

Customer Description:

Lab Number: 222085-005

Preparation:

Date Collected: 06/27/2022 11:56 EDT

Date Received: 07/01/2022 10:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	07/22/2022 10:07	EPA 200.8-1994, Rev. 5.4
Barium	0.06	µg/L	1	0.20	0.05	J1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Boron	0.024	mg/L	1	0.050	0.009	J1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Chromium	1.04	µg/L	1	0.20	0.04		GES	07/22/2022 10:07	EPA 200.8-1994, Rev. 5.4
Cobalt	0.012	µg/L	1	0.020	0.003	J1	GES	07/22/2022 10:07	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.00006	mg/L	1	0.00020	0.00005	J1	GES	07/22/2022 10:07	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	07/19/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	07/22/2022 10:07	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	07/14/2022 16:14	EPA 200.8-1994, Rev. 5.4

222085

Job Comments:

Original report issued 8/9/2022. Report reissued with amended matrix spike precision calculations.



## Water Analysis Report

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

**Reissued**

Job ID: 222085

Customer: Welsh Power Station

Date Reported: 12/30/2022

### 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**

### Data Qualifier 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.



WATER & WASTE SAMPLE RECEIPT FORM (IR#1)

<u>Package Type</u>			<u>Delivery Type</u>			
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEx	<input type="radio"/> USPS
			Other _____			
Plant/Customer <u>Welsh</u>		Number of Plastic Containers: <u>17</u>				
Opened By <u>MSO</u>		Number of Glass Containers: <u>5</u>				
Date/Time <u>7/1/22 10:30AM</u>		Number of Mercury Containers: <u>—</u>				
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice <input checked="" type="radio"/> no ice						
(IR Gun Ser# 210441568, Expir.5/27/2023) - If No, specify each deviation: _____						
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____						
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____						
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____						
pH (15 min)	Cr <sup>6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: \_\_\_\_\_

pH paper (circle one): MQuant pH Cat 1.09535.0001 \_\_\_\_\_ (OR) Lab rat pH Cat # LRS -4801 \_\_\_\_\_  
lot HC904495 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# 222085 Initial & Date & Time : \_\_\_\_\_

Logged by MSO Comments: \_\_\_\_\_

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.

# Mercury Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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      Chemist      7-21-22  
Name (printed)      Signature      Official Title      Date

## Mercury Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Walsh Power  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 7.21.22  
**Laboratory Job Number:** 222085  
**Prep Batch Number(s):** PB22070806

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Mercury Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	



## Mercury Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 7-21-22  
**Laboratory Job Number:** 222085  
**Prep Batch Number(s):** PP22070806

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# ICP-MS Laboratory Review Checklist

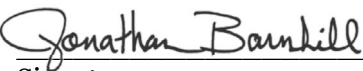
## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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	8-2-2022
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:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 8-2-2022  
**Laboratory Job Number:** 222085  
**Prep Batch Number(s):** PB22070706 PB22072101 QC2207151 QC2207182

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## ICP-MS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** \_\_\_\_\_

**Reviewer Name:** Jonathan Barnhill

**LRC Date:** 8-2-2022

**Laboratory Job Number:** 222085

**Prep Batch Number(s):** PB22070706 PB22072101 QC2207151 QC2207182

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# ICP-MS Laboratory Review Checklist

**Table 3. Exception Reports.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 8-2-2022  
**Laboratory Job Number:** 222085  
**Prep Batch Number(s):** PB22070706 PB22072101 QC2207151 QC2207182

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$ .

<sup>1</sup> 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.  
<sup>2</sup> O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).  
<sup>3</sup> NA - Not applicable; NR - Not reviewed.  
<sup>4</sup> Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”

**APPENDIX 6**

**2H 2022 analytical reports.**



# Water Analysis Report

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

**Reissued**

Job ID: 223481

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: AD-1

Customer Description: TG-32

Lab Number: 223481-001

Preparation:

Date Collected: 11/01/2022 11:58 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.70	mg/L	2	0.04	0.02		CRJ	11/15/2022 20:47	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.14	mg/L	2	0.06	0.02		CRJ	11/15/2022 20:47	EPA 300.1 -1997, Rev. 1.0
Sulfate	61.3	mg/L	2	0.40	0.06		CRJ	11/15/2022 20:47	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		SDW	11/04/2022 12:35	SM 2540C-2015

Customer Sample ID: AD-5

Customer Description: TG-32

Lab Number: 223481-002

Preparation:

Date Collected: 11/01/2022 09:56 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	16.9	mg/L	2	0.04	0.02		CRJ	11/16/2022 01:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	2	0.06	0.02		CRJ	11/16/2022 01:43	EPA 300.1 -1997, Rev. 1.0
Sulfate	185	mg/L	10	2.0	0.3		CRJ	11/15/2022 21:53	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	380	mg/L	1	50	20		SDW	11/04/2022 12:35	SM 2540C-2015

Customer Sample ID: AD-17

Customer Description: TG-32

Lab Number: 223481-003

Preparation:

Date Collected: 11/01/2022 13:25 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	40.3	mg/L	5	0.10	0.05		CRJ	11/16/2022 02:16	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	5	0.15	0.05	J1	CRJ	11/16/2022 02:16	EPA 300.1 -1997, Rev. 1.0
Sulfate	1110	mg/L	50	10	2		CRJ	11/15/2022 22:26	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1690	mg/L	1	50	20		SDW	11/04/2022 12:40	SM 2540C-2015



# Water Analysis Report

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

**Reissued**

Job ID: 223481

Customer: Welsh Power Station

Date Reported: 12/30/2022

Customer Sample ID: DUPLICATE - BAP

Customer Description: TG-32

Lab Number: 223481-004

Preparation:

Date Collected: 11/01/2022 15:00 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.91	mg/L	2	0.04	0.02		CRJ	11/15/2022 12:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.14	mg/L	2	0.06	0.02		CRJ	11/15/2022 12:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	60.7	mg/L	2	0.40	0.06		CRJ	11/15/2022 12:33	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		SDW	11/04/2022 12:40	SM 2540C-2015

223481

Job Comments:

Original report issued 11/18/2022. Report reissued with amended matrix spike precision calculations.

## 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**



## Water Analysis Report

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

**Reissued**

Job ID: 223481

Customer: Welsh Power Station

Date Reported: 12/30/2022

### Data Qualifier Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.





# WATER & WASTE SAMPLE RECEIPT FORM (Temp Gun 1)

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	Box	Bag	Envelope	PONY	UPS	FedEX	USPS
			Other _____				
Plant/Customer <u>Welsh BASP</u>			Number of Plastic Containers: <u>4</u>				
Opened By <u>Michael</u>			Number of Glass Containers: _____				
Date/Time <u>11/03/22 10:30</u>			Number of Mercury Containers: _____				
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or N/A Initial: <u>m/jk</u> <input checked="" type="radio"/> on ice / <input type="radio"/> no ice (IR Gun Ser# 221368900, Expir. 3/22/2024) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: m/jk 11/03/22

pH paper (circle one): MQuant, PN1.09535.0001, LOT# HC904495 [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# 223481 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.

# Ion Chromatography Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

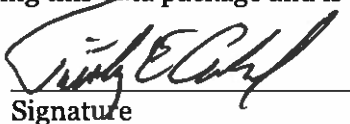
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  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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 E Arnold  
Name (printed)

  
Signature

Chemist Prin  
Official Title

11/17/2022  
Date



## Ion Chromatography Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Background  
**Reviewer Name:** Timothy E Arnold  
**LRC Date:** 11/17/2022  
**Laboratory Job Number:** 223481  
**Prep Batch Number(s):** QC2211157

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Ion Chromatography Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** Welsh Background

**Reviewer Name:** Timothy E Arnold

**LRC Date:** 11/17/2022

**Laboratory Job Number:** 223481

**Prep Batch Number(s):** QC2211157

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



## TDS Laboratory Review Checklist

### Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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

Name (printed)

Signature

Chemist

Official Title

11/18/21

Date

## TDS Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh BASP  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 11/18/22  
**Laboratory Job Number:** 223481  
**Prep Batch Number(s):** QC2211076

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## TDS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	



## TDS Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh BASP  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 4/5/22  
**Laboratory Job Number:** 223481  
**Prep Batch Number(s):** QC2211076

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	





# Water Analysis Report

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

Job ID: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-1

Customer Description: TG-32

Lab Number: 223510-001

Preparation:

Date Collected: 11/01/2022 11:58 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.03	µg/L	1	0.10	0.02	J1	GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Arsenic	0.19	µg/L	1	0.10	0.03		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Barium	78.9	µg/L	1	0.20	0.05		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Beryllium	0.620	µg/L	1	0.050	0.007		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Boron	0.586	mg/L	1	0.050	0.009		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Cadmium	0.024	µg/L	1	0.020	0.004		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Calcium	7.87	mg/L	1	0.05	0.02		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.20	0.04		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Cobalt	1.17	µg/L	1	0.020	0.003		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Lead	0.13	µg/L	1	0.20	0.05	J1	GES	12/01/2022 15:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.00818	mg/L	1	0.00020	0.00005		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Selenium	5.51	µg/L	1	0.50	0.09		GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/21/2022 22:32	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.06	pCi/L	0.29	0.50	P1	ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.5	%						
Radium-228	0.95	pCi/L	0.14	0.42		TTP	11/17/2022 15:56	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.



# Water Analysis Report

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

Job ID: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-5

Customer Description: TG-32

Lab Number: 223510-002

Preparation:

Date Collected: 11/01/2022 09:56 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Arsenic	2.77	µg/L	1	0.10	0.03		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Barium	63.2	µg/L	1	0.20	0.05		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Beryllium	0.046	µg/L	1	0.050	0.007	J1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Boron	0.041	mg/L	1	0.050	0.009	J1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Calcium	38.6	mg/L	1	0.05	0.02		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Chromium	0.43	µg/L	1	0.20	0.04		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Cobalt	15.1	µg/L	1	0.020	0.003		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	12/01/2022 15:39	EPA 200.8-1994, Rev. 5.4
Lithium	0.174	mg/L	1	0.00020	0.00005		GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/21/2022 22:37	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.90	pCi/L	0.38	0.55		ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	93.6	%						
Radium-228	1.98	pCi/L	0.18	0.52		TTP	11/17/2022 15:56	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	81.7	%						

\* 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.



# Water Analysis Report

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

Job ID: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-17

Customer Description: TG-32

Lab Number: 223510-003

Preparation:

Date Collected: 11/01/2022 13:25 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.02	µg/L	1	0.10	0.02	J1	GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.62	µg/L	1	0.10	0.03		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Barium	12.7	µg/L	1	0.20	0.05		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Beryllium	0.073	µg/L	1	0.050	0.007		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Boron	0.097	mg/L	1	0.050	0.009		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.019	µg/L	1	0.020	0.004	J1	GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Calcium	165	mg/L	1	0.05	0.02		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Chromium	0.96	µg/L	1	0.20	0.04		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Cobalt	41.9	µg/L	1	0.020	0.003		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Lead	0.27	µg/L	1	0.20	0.05		GES	12/01/2022 15:44	EPA 200.8-1994, Rev. 5.4
Lithium	0.278	mg/L	1	0.00020	0.00005		GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Mercury	4	ng/L	1	5	2	J1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/21/2022 22:43	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.42	pCi/L	0.41	0.52		ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	97.8	%						
Radium-228	1.39	pCi/L	0.14	0.42		TTP	11/17/2022 15:56	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	92.4	%						

\* 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.



# Water Analysis Report

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

Job ID: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: Dup Background

Customer Description: TG-32

Lab Number: 223510-004

Preparation:

Date Collected: 11/01/2022 15:00 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.03	µg/L	1	0.10	0.02	J1	GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Arsenic	0.19	µg/L	1	0.10	0.03		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Barium	77.1	µg/L	1	0.20	0.05		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Beryllium	0.593	µg/L	1	0.050	0.007		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Boron	0.568	mg/L	1	0.050	0.009		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Cadmium	0.026	µg/L	1	0.020	0.004		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Calcium	7.61	mg/L	1	0.05	0.02		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.53	µg/L	1	0.20	0.04		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Cobalt	1.17	µg/L	1	0.020	0.003		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Lead	0.13	µg/L	1	0.20	0.05	J1	GES	12/01/2022 16:41	EPA 200.8-1994, Rev. 5.4
Lithium	0.00781	mg/L	1	0.00020	0.00005		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Selenium	5.31	µg/L	1	0.50	0.09		GES	11/21/2022 22:48	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/21/2022 22:48	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: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: EB- Background

Customer Description: TG-32

Lab Number: 223510-005

Preparation:

Date Collected: 11/01/2022 11:37 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Barium	0.06	µg/L	1	0.20	0.05	J1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Boron	0.010	mg/L	1	0.050	0.009	J1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.52	µg/L	1	0.20	0.04		GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Cobalt	0.161	µg/L	1	0.020	0.003		GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.00006	mg/L	1	0.00020	0.00005	J1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.8	µg/L	1	0.5	0.1		GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/22/2022 11:09	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/22/2022 11:09	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: 223510

Customer: Welsh Power Station

Date Reported: 12/20/2022

### 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**

### Data Qualifier 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).

**P1** - The precision between duplicate results was above acceptance limits.





# WATER & WASTE SAMPLE RECEIPT FORM (Temp Gun 1)

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
				Other _____			
Plant/Customer <u>Walsh</u>			Number of Plastic Containers: <u>17</u>				
Opened By <u>MGK</u>			Number of Glass Containers: _____				
Date/Time <u>11/4/22 1:30pm</u>			Number of Mercury Containers: <u>5</u>				
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / no ice (IR Gun Ser# 221368900, Expir. 3/22/2024) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____							
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres ) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: JAB/MGK 11/4/22

pH paper (circle one): MQuant,PN1.09535.0001,LOT# HC904495  [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# 223510 Initial & Date & Time : \_\_\_\_\_

Logged by MSD Comments: \_\_\_\_\_

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.

# ICP-MS Laboratory Review Checklist

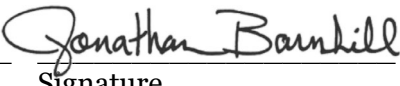
## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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	12/13/2022
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:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 12/13/2022  
**Laboratory Job Number:** 223510  
**Prep Batch Number(s):** PB22111712 PB22112101 PB22112902 QC2211221 QC2211222 QC2212034

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	I	Were all samples prepared and analyzed within holding times?		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## ICP-MS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** \_\_\_\_\_

**Reviewer Name:** Jonathan Barnhill

**LRC Date:** 12/13/2022

**Laboratory Job Number:** 223510

**Prep Batch Number(s):** PB22111712 PB22112101 PB22112902 QC2211221 QC2211222 QC2212034

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# ICP-MS Laboratory Review Checklist

**Table 3. Exception Reports.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 12/13/2022  
**Laboratory Job Number:** 223510  
**Prep Batch Number(s):** PB22111712 PB22112101 PB22112902 QC2211221 QC2211222 QC2212034

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$ .

<sup>1</sup> 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.  
<sup>2</sup> O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).  
<sup>3</sup> NA - Not applicable; NR - Not reviewed.  
<sup>4</sup> Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”

# Mercury Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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		Senior Chemist	11-16-2022
Name (printed)	Signature	Official Title	Date

## Mercury Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power Station  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 11-16-2022  
**Laboratory Job Number:** 223510  
**Prep Batch Number(s):** PB22110704

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Mercury Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## Mercury Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power Station  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 11-16-2022  
**Laboratory Job Number:** 223510  
**Prep Batch Number(s):** PB22110704

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	





# Water Analysis Report

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

Job ID: 223483

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-8

Customer Description: TG-32

Lab Number: 223483-001

Preparation:

Date Collected: 10/31/2022 10:08 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	20.9	mg/L	2	0.04	0.02		CRJ	11/16/2022 11:05	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.93	mg/L	2	0.06	0.02		CRJ	11/16/2022 11:05	EPA 300.1 -1997, Rev. 1.0
Sulfate	141	mg/L	10	2.0	0.3		CRJ	11/16/2022 10:32	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	280	mg/L	1	50	20		SDW	11/04/2022 13:47	SM 2540C-2015

Customer Sample ID: AD-9

Customer Description: TG-32

Lab Number: 223483-002

Preparation:

Date Collected: 10/31/2022 11:20 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	16.8	mg/L	5	0.10	0.05		CRJ	11/16/2022 12:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.17	mg/L	5	0.15	0.05		CRJ	11/16/2022 12:43	EPA 300.1 -1997, Rev. 1.0
Sulfate	122	mg/L	5	1.0	0.2		CRJ	11/16/2022 12:43	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	300	mg/L	1	50	20		SDW	11/04/2022 13:54	SM 2540C-2015

Customer Sample ID: AD-15

Customer Description: TG-32

Lab Number: 223483-003

Preparation:

Date Collected: 10/31/2022 10:33 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	26.2	mg/L	2	0.04	0.02		CRJ	11/16/2022 15:28	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	11/16/2022 15:28	EPA 300.1 -1997, Rev. 1.0
Sulfate	4.62	mg/L	2	0.40	0.06		CRJ	11/16/2022 15:28	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	90	mg/L	1	50	20		SDW	11/04/2022 13:54	SM 2540C-2015





# Water Analysis Report

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

Job ID: 223483

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: DUPLICATE - PBAP

Customer Description: TG-32

Lab Number: 223483-004

Preparation:

Date Collected: 10/31/2022 15:00 EDT

Date Received: 11/03/2022 10:30 EDT

## Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	20.8	mg/L	2	0.04	0.02		CRJ	11/16/2022 14:23	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.94	mg/L	2	0.06	0.02		CRJ	11/16/2022 14:23	EPA 300.1 -1997, Rev. 1.0
Sulfate	134	mg/L	25	5.0	0.8		CRJ	11/16/2022 13:49	EPA 300.1 -1997, Rev. 1.0

## Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	280	mg/L	1	50	20		SDW	11/04/2022 14:01	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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**





# WATER & WASTE SAMPLE RECEIPT FORM (Temp Gun 1)

<u>Package Type</u> <input checked="" type="radio"/> Cooler <input type="radio"/> Box <input type="radio"/> Bag <input type="radio"/> Envelope			<u>Delivery Type</u> PONY    UPS    FedEX    USPS Other _____			
Plant/Customer <u>Welsh BASP</u>		Number of Plastic Containers: <u>4</u>				
Opened By <u>Michael</u>		Number of Glass Containers: _____				
Date/Time <u>11/03/22 10:30</u>		Number of Mercury Containers: _____				
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or N/A Initial: <u>mbk</u> <input checked="" type="radio"/> on ice / <input type="radio"/> no ice (IR Gun Ser# 221368900, Expir. 3/22/2024) - If No, specify each deviation: _____						
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____						
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____						
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____						
pH (15 min)	Cr <sup>6+</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: mbk 11/03/22

pH paper (circle one): MQuant,PN1.09535.0001,LOT# HC904495 \_\_\_\_\_ [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# 293483 Initial & Date & Time : \_\_\_\_\_

Logged by MSO Comments: \_\_\_\_\_

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.

# TDS Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

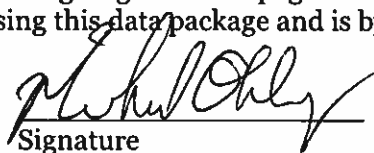
- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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

Name (printed)



Signature

Chemist

Official Title

11/28/22

Date

## TDS Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh PBAP  
**Reviewer Name:** Michael Ohlinger  
**LRC Date:** 11/28/22  
**Laboratory Job Number:** 223483  
**Prep Batch Number(s):** QC2211066

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## TDS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## TDS Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory

**Project Name:** Welsh PBAP

**Reviewer Name:** Michael Ohlinger

**LRC Date:** 4/5/22

**Laboratory Job Number:** 223483

**Prep Batch Number(s):** QC2211066

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	





# Ion Chromatography Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

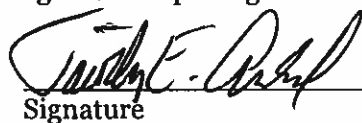
This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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 E. Arnold  
Name (printed)

  
Signature

Chemist Prin  
Official Title

11/17/2022  
Date

## Ion Chromatography Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh PBAP  
**Reviewer Name:** Timothy E Arnold  
**LRC Date:** 11/17/2022  
**Laboratory Job Number:** 223483  
**Prep Batch Number(s):** QC2111158

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Ion Chromatography Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** Welsh PBAP  
**Reviewer Name:** Timothy E Arnold  
**LRC Date:** 11/17/2022  
**Laboratory Job Number:** 223483  
**Prep Batch Number(s):** QC2111158

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	





# Water Analysis Report

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

Job ID: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-8

Customer Description: TG-32

Lab Number: 223511-001

Preparation:

Date Collected: 10/31/2022 10:08 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Arsenic	0.25	µg/L	1	0.10	0.03		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Barium	27.8	µg/L	1	0.20	0.05		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Beryllium	0.01	µg/L	1	0.050	0.007	J1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Boron	1.08	mg/L	1	0.050	0.009		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.038	µg/L	1	0.020	0.004		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Calcium	22.3	mg/L	1	0.05	0.02		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.20	0.04		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Cobalt	8.92	µg/L	1	0.020	0.003		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0559	mg/L	1	0.00020	0.00005		GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.2	µg/L	1	0.5	0.1	J1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.04	J1	GES	11/22/2022 11:14	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.36	pCi/L	0.18	0.49		ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.5	%						
Radium-228	0.74	pCi/L	0.18	0.57		TTP	11/17/2022 15:56	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	72.3	%						

\* 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.





# Water Analysis Report

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

Job ID: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-9

Customer Description: TG-32

Lab Number: 223511-002

Preparation:

Date Collected: 10/31/2022 11:20 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Arsenic	0.21	µg/L	1	0.10	0.03		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Barium	52.0	µg/L	1	0.20	0.05		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Beryllium	1.14	µg/L	5	0.25	0.04		GES	11/28/2022 08:57	EPA 200.8-1994, Rev. 5.4
Boron	0.109	mg/L	1	0.050	0.009		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Cadmium	0.199	µg/L	1	0.020	0.004		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Calcium	12.4	mg/L	1	0.05	0.02		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Chromium	1.23	µg/L	1	0.20	0.04		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Cobalt	17.1	µg/L	1	0.020	0.003		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Lithium	0.231	mg/L	5	0.0010	0.0003		GES	11/28/2022 08:57	EPA 200.8-1994, Rev. 5.4
Mercury	4	ng/L	1	5	2	J1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Selenium	0.27	µg/L	1	0.50	0.09	J1	GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4
Thallium	0.22	µg/L	1	0.20	0.04		GES	11/22/2022 12:10	EPA 200.8-1994, Rev. 5.4

## Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.06	pCi/L	0.30	0.58		ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	81.1	%						
Radium-228	-1.43	pCi/L	0.18	0.67		TTP	11/17/2022 15:56	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	74.8	%						

\* 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.



# Water Analysis Report

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

Job ID: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: AD-15

Customer Description: TG-32

Lab Number: 223511-003

Preparation:

Date Collected: 10/31/2022 10:33 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Arsenic	2.55	µg/L	1	0.10	0.03		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Barium	75.3	µg/L	1	0.20	0.05		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Beryllium	0.187	µg/L	1	0.050	0.007		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Boron	0.093	mg/L	1	0.050	0.009		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Cadmium	0.015	µg/L	1	0.020	0.004	J1	GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Calcium	2.57	mg/L	1	0.05	0.02		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Chromium	0.41	µg/L	1	0.20	0.04		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Cobalt	2.94	µg/L	1	0.020	0.003		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Lithium	0.00235	mg/L	1	0.00020	0.00005		GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Selenium	0.38	µg/L	1	0.50	0.09	J1	GES	11/22/2022 12:15	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	11/22/2022 12:15	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	0.27	0.44		ST	11/15/2022 14:39	SW-846 9315-1986, Rev. 0
Carrier Recovery	98.9	%						
Radium-228	0.55	pCi/L	0.16	0.52		TTP	11/17/2022 15:56	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	90.9	%						

\* 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.



# Water Analysis Report

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

Job ID: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: DUPLICATE - PBAP

Customer Description: TG-32

Lab Number: 223511-004

Preparation:

Date Collected: 10/31/2022 15:00 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Arsenic	0.24	µg/L	1	0.10	0.03		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Barium	27.5	µg/L	1	0.20	0.05		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Beryllium	0.009	µg/L	1	0.050	0.007	J1	GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Boron	1.10	mg/L	1	0.050	0.009		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Cadmium	0.041	µg/L	1	0.020	0.004		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Calcium	22.2	mg/L	1	0.05	0.02		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.20	0.04		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Cobalt	9.00	µg/L	1	0.020	0.003		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Lithium	0.0558	mg/L	1	0.00020	0.00005		GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/22/2022 12:21	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.04	J1	GES	11/22/2022 12:21	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: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

Customer Sample ID: EQUIPMENT BLANK - PBAP

Customer Description: TG-32

Lab Number: 223511-005

Preparation:

Date Collected: 10/31/2022 11:00 EDT

Date Received: 11/04/2022 13:30 EDT

## Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Chromium	0.53	µg/L	1	0.20	0.04		GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Cobalt	0.157	µg/L	1	0.020	0.003		GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Lithium	0.00012	mg/L	1	0.00020	0.00005	J1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2022 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.2	µg/L	1	0.5	0.1	J1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	11/22/2022 12:26	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	11/22/2022 12:26	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: 223511

Customer: Welsh Power Station

Date Reported: 12/20/2022

### 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

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.**

### Data Qualifier 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.





# WATER & WASTE SAMPLE RECEIPT FORM (Temp Gun 1)

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
			Other _____				
Plant/Customer <u>Walsh</u>			Number of Plastic Containers: <u>17</u>				
Opened By <u>MSK</u>			Number of Glass Containers: _____				
Date/Time <u>11/4/22</u>			Number of Mercury Containers: <u>5</u>				
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or <input checked="" type="radio"/> N/A Initial: _____ on ice / no ice (IR Gun Ser# 221368900, Expir. 3/22/2024) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MSK/JAB 11/4/22

pH paper (circle one): MQuant,PN1.09535.0001,LOT# HC904495  (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# 223511 Initial & Date & Time : \_\_\_\_\_

Logged by MSD Comments: \_\_\_\_\_

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.

# Mercury Laboratory Review Checklist

## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- 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.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- 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)
- R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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	<u>S. Sulzmann</u>	Senior chemist	11-16-2022
Name (printed)	Signature	Official Title	Date



## Mercury Laboratory Review Checklist

**Table 1. Reportable Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power Station  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 11-16-2022  
**Laboratory Job Number:** 223511  
**Prep Batch Number(s):** PB22110704, PB22110705

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## Mercury Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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?		
	I	Were MS/MSD RPDs within laboratory QC limits?		
R8	O, I	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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	

## Mercury Laboratory Review Checklist

**Table 2. Supporting Data.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** Welsh Power Station  
**Reviewer Name:** Susann Sulzmann  
**LRC Date:** 11-16-2022  
**Laboratory Job Number:** 223511  
**Prep Batch Number(s):** PB22110704, PB22110705

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



# ICP-MS Laboratory Review Checklist

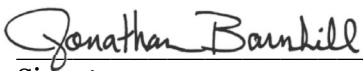
## Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- R2 Sample identification cross-reference
- 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
- R5 Test reports/summary forms for blank samples
- 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
- 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
- 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
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- 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	12/13/2022
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:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 12/13/2022  
**Laboratory Job Number:** 223511  
**Prep Batch Number(s):** PB22112101 QC2211222 QC2211238

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
R1	O, I	<b>Chain-of-custody (COC)</b>		
	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	<b>Sample and quality control (QC) identification</b>		
	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	<b>Test reports</b>		
	I	Were all samples prepared and analyzed within holding times?		
	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	<b>Surrogate recovery data</b>		
	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	<b>Test reports/summary forms for blank samples</b>		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

## ICP-MS Laboratory Review Checklist

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
	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	<b>Laboratory control samples (LCS):</b>		
	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	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>		
	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	<b>Analytical duplicate data</b>		
	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	<b>Method quantitation limits (MQLs):</b>		
	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	<b>Other problems/anomalies</b>		
	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:** \_\_\_\_\_

**Reviewer Name:** Jonathan Barnhill

**LRC Date:** 12/13/2022

**Laboratory Job Number:** 223511

**Prep Batch Number(s):** PB22112101 QC2211222 QC2211238

Item <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S1	O, I	<b>Initial calibration (ICAL)</b>		
	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	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):</b>		
	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	<b>Mass spectral tuning:</b>		
	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	<b>Internal standards (IS):</b>		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.)</b>		
	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 <sup>1</sup>	Analytes <sup>2</sup>	Description	Result (Yes, No, NA, NR) <sup>3</sup>	Exception Report No. <sup>4</sup>
S6	O	<b>Dual column confirmation</b>		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	<b>Tentatively identified compounds (TICs):</b>		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	<b>Interference Check Sample (ICS) results:</b>		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	<b>Method detection limit (MDL) studies</b>		
	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	<b>Proficiency test reports:</b>		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	<b>Standards documentation</b>		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	<b>Compound/analyte identification procedures</b>		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	<b>Demonstration of analyst competency (DOC)</b>		
	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	<b>Verification/validation documentation for methods (NELAC Chap 5n 5)</b>		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	<b>Laboratory standard operating procedures (SOPs):</b>		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

# ICP-MS Laboratory Review Checklist

**Table 3. Exception Reports.**

**Laboratory Name:** American Electric Power Dolan Chemical Laboratory  
**Project Name:** \_\_\_\_\_  
**Reviewer Name:** Jonathan Barnhill  
**LRC Date:** 12/13/2022  
**Laboratory Job Number:** 223511  
**Prep Batch Number(s):** PB22112101 QC2211222 QC2211238

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$ .

<sup>1</sup> 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.  
<sup>2</sup> O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).  
<sup>3</sup> NA - Not applicable; NR - Not reviewed.  
<sup>4</sup> Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”