

# **Annual Groundwater Monitoring Report**

Southwestern Electric Power Company

Flint Creek Power Plant

Landfill CCR Management Unit

Gentry, Arkansas

**January 2024**

Prepared by:

American Electric Power Service Corporation

1 Riverside Plaza

Columbus, Ohio 43215



An **AEP** Company

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## I. Overview

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for an existing CCR unit at Southwestern Electric Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP), Flint Creek Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31.

In general, the following activities were completed:

- The CCR unit was in Assessment monitoring at the beginning and at the end of 2023;
- Groundwater samples were collected on March 6-7, 2023 in accordance with 40 CFR 257.95(b) and analyzed for all Appendix IV constituents. Groundwater samples were collected on June 19-20, 2023 in accordance with 40 CFR 257.95(d)(1), and analyzed for all Appendix III constituents and those Appendix IV constituents that were detected during the previous sampling (in March 2023) in accordance with 40 CFR 257.95(b). Groundwater samples were collected on September 18-19, 2023 in accordance with 40 CFR 257.95(d)(1), and analyzed for all Appendix III constituents and those Appendix IV constituents that were detected during the March 2023 sampling in accordance with 40 CFR 257.95(b). All sampling was performed in accordance with 40 CFR 257.95 *et seq.*, and AEP's *Groundwater Sampling and Analysis Plan (2016)*;
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- Statistical analysis of assessment monitoring samples collected in March and June 2023 was completed on October 18, 2023.
- Statistical analysis of the assessment monitoring events of March and June 2023 determined that no statistically significant levels (SSLs) above the groundwater protection standards were detected.
- No alternative source demonstrations (ASDs) relative to the Appendix IV SSLs above the groundwater protection standard were conducted.

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

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates

the samples were collected and whether the sample was collected as part of detection monitoring or assessment monitoring programs is included in Appendix 1;

- Statistical comparison of monitoring data to determine if there have been SSLs above the groundwater protection standards (attached as Appendix 2, where applicable);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as Appendix 3, where applicable);
- A summary of any transition between monitoring programs, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring (notices attached as Appendix 4, where applicable);
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement regarding the rationale for the installation/decommission (Attached as Appendix 5, where applicable); and
- Other information required to be included in the annual report such as an alternate monitoring frequency, or assessment of corrective measures, if applicable.

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



## II. Groundwater Monitoring Well Locations and Identification Numbers

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

Landfill Monitoring Wells	
Upgradient	Downgradient
B-1B	B-2
B-4	B-6
B-5	B-9
B-7A	B-10
B-12	B-11
B-13	



### **III. Monitoring Wells Installed or Decommissioned**

There were no monitoring wells installed or decommissioned in 2023. The network design, as summarized in the *Groundwater Monitoring Network Design Report (2017)* and as posted at the CCR web site for the Flint Creek Plant, did not change. That design report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

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

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

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

Statistical analysis of assessment monitoring samples collected in September 2022 was completed on January 20, 2023. Statistical analysis of assessment monitoring samples collected in March and June 2023 was completed on October 18, 2023. Statistical analysis of samples collected during the September 2023 sampling event will be completed in 2024. No SSLs above the groundwater protection standards were identified during either the January 2023 or the October 2023 analysis. The results of these statistical analyses are documented in the corresponding statistical analysis summary report, both of which are provided in Appendix 2. Appendix 2 also contains a memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues.

### **VI. Alternate Source Demonstration**

ASDs relative to Appendix IV SSLs above the groundwater protection standard were not necessary because no SSLs above the groundwater protection standards were identified from the completed sampling events required by 40 CFR 257.95(d)(1). A statement to this effect is provided in Appendix 3.

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

No transition between monitoring requirements occurred in 2023; the CCR unit was in assessment monitoring at the beginning and at the end of 2023. A statement to this effect is provided in Appendix 4.

The Flint Creek landfill monitoring program would return to detection monitoring if all Appendix III and IV constituents are below background values for two consecutive monitoring events. If one

or more Appendix IV constituents exceed the corresponding groundwater protection standard due to a release from the landfill, and are not demonstrated to be caused by a source other than the CCR unit or resulting from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality by means of an ASD, an assessment of corrective measures will be undertaken as required by 40 CFR 257.96.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production is high enough at this facility that no modification of the assessment monitoring schedule is necessary.

### **VIII. Other Information Required**

The Flint Creek landfill has progressed from detection monitoring to its current status in assessment monitoring. All required information has been included in this annual groundwater monitoring report.

### **IX. Description of Any Problems Encountered in 2023 and Actions Taken**

No significant problems were encountered. Through the use of low-flow purging and sampling methodology, samples representative of uppermost aquifer groundwater were obtained and the schedule was met to support this annual groundwater report preparation.

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

Key activities for 2024 include:

- Assessment monitoring on a semiannual schedule;
- Statistical evaluation of the assessment monitoring results to determine any statistically significant increases (or decreases with respect to pH) over an established groundwater protection standard, or whether the concentrations have returned below background concentrations;
- Responding to any new data received in light of CCR rule requirements;
- Preparation of the next annual groundwater report.

## **APPENDIX 1 - Groundwater Data Tables and Figures**

Tables follow showing the groundwater monitoring data collected, the rate of groundwater flow each time groundwater was sampled, the number of samples collected per monitoring well, dates that the samples were collected, and whether each sample was collected as part of a detection monitoring or an assessment monitoring program. Figures follow showing the PE-certified groundwater monitoring network with the corresponding well identifications along with static water elevation data and groundwater flow directions each time groundwater was sampled in the form of annotated satellite images.

**Table 1. Groundwater Data Summary: B-1B  
Flint Creek - LF  
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.02	90.8	3	0.5955 J1	8.1	22	296
7/19/2016	Background	0.02	92.4	4	0.4424 J1	7.1	25	281
9/14/2016	Background	0.02	96.3	3	0.4087 J1	7.0	24	296
10/5/2016	Background	0.02	89.3	5	0.4557 J1	7.5	25	294
11/7/2016	Background	0.02	86.5	4	< 0.083 U1	7.2	24	270
1/24/2017	Background	0.02	85.9	2	< 0.083 U1	7.7	22	276
3/6/2017	Background	0.02	88.7	2	< 0.083 U1	7.4	23	272
4/25/2017	Background	0.02041	88.1	4	0.53 J1	6.5	23	268
5/15/2017	Background	0.01982	85.5	3	0.4551 J1	6.8	20	240
6/12/2017	Background	0.02962	85.1	4	< 0.083 U1	6.3	21	276
8/29/2017	Detection	0.0579	83.3	3	0.416 J1	7.9	20	264
3/26/2018	Assessment	0.01493	89.6	2	0.098 J1	7.5	22	268
8/28/2018	Assessment	0.026	87.6	--	--	7.3	--	288
10/23/2018	Assessment	--	--	5.53	0.489 J1	--	14.8	--
3/12/2019	Assessment	0.02 J1	93.1	2.31	0.41	7.6	17.5	228
6/10/2019	Assessment	0.05 J1	92.4	2.31	0.49	6.6	20.7	266
8/27/2019	Assessment	< 0.02 U1	86.5	2	0.275 J1	7.4	20	312
3/23/2020	Assessment	--	--	--	--	7.1	--	--
3/24/2020	Assessment	--	--	2.39	0.40	--	21.8	258
6/23/2020	Assessment	--	--	--	--	7.4	--	--
6/24/2020	Assessment	< 0.02 U1	87.0	2.22	0.36	--	23.7	272
10/19/2020	Assessment	--	--	--	--	7.7	--	--
10/20/2020	Assessment	0.03 J1	85.5	2.23	0.37	--	24.5	293
3/1/2021	Assessment	--	--	--	--	7.0	--	--
3/2/2021	Assessment	--	--	--	0.42	--	--	--
6/21/2021	Assessment	0.014 J1	84.8	2.20	0.39	7.2	18.7	290
9/20/2021	Assessment	--	--	--	--	7.7	--	--
9/21/2021	Assessment	0.010 J1	86.1	2.23	0.37	--	19.2	290
3/14/2022	Assessment	--	--	--	--	7.1	--	--
3/15/2022	Assessment	--	--	--	0.39	--	--	--
6/13/2022	Assessment	--	--	--	--	7.0	--	--
6/14/2022	Assessment	< 0.009 U1	73.4 M1, P3	2.10	0.38	--	15.4	310
9/20/2022	Assessment	--	--	--	--	7.0	--	--
9/21/2022	Assessment	0.011 J1	80.3 M1, P3	2.18	0.37	--	15.5	280
3/6/2023	Assessment	--	--	--	--	7.1	--	--
3/7/2023	Assessment	--	--	--	0.35	--	--	--
6/19/2023	Assessment	--	--	--	--	7.1	--	--
6/20/2023	Assessment	0.012 J1	82.4	2.58	0.36	--	20.2	290
9/18/2023	Assessment	--	--	--	--	7.4	--	--
9/19/2023	Assessment	0.012 J1	84.2	2.18	0.34	--	21.1	280

Table 1. Groundwater Data Summary: B-1B

Flint Creek - LF  
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	112	0.0480724 J1	< 0.07 U1	0.801049 J1	0.441945 J1	3.583	0.5955 J1	< 0.68 U1	0.028	0.02301 J1	2.01197 J1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	118	0.0361035 J1	< 0.07 U1	0.611765 J1	0.527203 J1	--	0.4424 J1	1.03545 J1	0.028	0.01793 J1	0.869973 J1	< 0.99 U1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	125	< 0.02 U1	< 0.07 U1	1	0.454131 J1	8.375	0.4087 J1	0.999779 J1	0.028	< 0.005 U1	0.612698 J1	< 0.99 U1	< 0.86 U1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	122	0.0372394 J1	< 0.07 U1	0.984649 J1	0.750457 J1	8.79	0.4557 J1	1.03454 J1	0.041	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/7/2016	Background	< 0.93 U1	< 1.05 U1	131	0.033331 J1	0.0774505 J1	2	0.917319 J1	4.63	< 0.083 U1	1.03555 J1	0.027	0.00589 J1	0.297867 J1	< 0.99 U1	< 0.86 U1
1/24/2017	Background	< 0.93 U1	1.26762 J1	97	0.0223085 J1	< 0.07 U1	1	0.385362 J1	3.178	< 0.083 U1	< 0.68 U1	0.026	0.00757 J1	0.6452 J1	< 0.99 U1	< 0.86 U1
3/6/2017	Background	< 0.93 U1	< 1.05 U1	123	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.325089 J1	3.604	< 0.083 U1	< 0.68 U1	0.034	< 0.005 U1	0.561767 J1	< 0.99 U1	< 0.86 U1
4/25/2017	Background	1.27 J1	< 1.05 U1	112	0.04 J1	< 0.07 U1	0.85 J1	0.49 J1	3.841	0.53 J1	< 0.68 U1	0.02658	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	< 1.05 U1	118	0.03 J1	< 0.07 U1	0.3 J1	0.49 J1	1.448	0.4551 J1	< 0.68 U1	0.02701	0.009 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/12/2017	Background	< 0.93 U1	1.43 J1	123	< 0.02 U1	< 0.07 U1	0.33 J1	0.47 J1	5.15	< 0.083 U1	< 0.68 U1	0.02717	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/26/2018	Assessment	< 0.93 U1	< 1.05 U1	108	< 0.02 U1	< 0.07 U1	1.22	0.21 J1	4.485	0.098 J1	0.8 J1	0.0266	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/28/2018	Assessment	0.08	0.33	112	0.02 J1	0.07	0.263	0.102	6.51	--	0.247	0.0278	< 0.005 U1	1.17	0.04 J1	0.01 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	0.489 J1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.4 J1	112	< 0.1 U1	< 0.05 U1	< 0.2 U1	< 0.1 U1	3.924	0.41	1.25	0.0264	< 0.005 U1	< 2 U1	< 0.2 U1	< 0.5 U1
6/10/2019	Assessment	0.03 J1	0.62	112	0.02 J1	0.02 J1	0.368	0.051	5.96	0.49	0.530	< 0.02 U1	< 0.005 U1	0.8 J1	< 0.03 U1	< 0.1 U1
8/27/2019	Assessment	0.11	0.57	114	< 0.02 U1	0.06	0.278	0.05 J1	4.73	0.275 J1	0.395	0.0231	< 0.005 U1	1 J1	< 0.03 U1	< 0.1 U1
3/24/2020	Assessment	0.12	0.34	116	< 0.02 U1	0.04 J1	0.07 J1	0.02 J1	5.38	0.40	0.06 J1	0.0242	< 0.002 U1	1 J1	0.08 J1	< 0.1 U1
6/24/2020	Assessment	0.03 J1	0.77	113	< 0.02 U1	0.02 J1	0.273	0.05 J1	4.558	0.36	0.07 J1	0.0243	< 0.002 U1	1 J1	0.04 J1	< 0.1 U1
10/20/2020	Assessment	0.04 J1	0.63	108	< 0.02 U1	0.01 J1	< 0.04 U1	0.072	5.16	0.37	0.07 J1	0.0229	< 0.002 U1	2.29	0.05 J1	0.1 J1
3/2/2021	Assessment	0.02 J1	0.67	102	0.03 J1	< 0.01 U1	0.1 J1	0.04 J1	4.629	0.42	< 0.05 U1	0.0247	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/21/2021	Assessment	< 0.02 U1	0.23	102	0.013 J1	0.007 J1	0.43	0.057	3.94	0.39	0.06 J1	0.0231	< 0.002 U1	0.3 J1	< 0.09 U1	< 0.04 U1
9/21/2021	Assessment	< 0.02 U1	0.28	111	0.008 P2, J1	< 0.004 U1	0.22	0.015 J1	5.07	0.37	< 0.05 U1	0.0243 P2	< 0.002 U1	1.0	< 0.09 U1	< 0.04 U1
3/15/2022	Assessment	0.02 J1	0.41	113	0.022 J1	0.019 J1	0.35	0.044	7.14	0.39	0.42	0.0254	< 0.002 U1	0.9	< 0.09 U1	< 0.04 U1
6/14/2022	Assessment	< 0.02 U1	0.13	109 M1, P3	0.015 J1	< 0.004 U1	0.38	0.018 J1	4.41	0.38	0.05 J1	0.0247	< 0.002 U1	0.2 J1	< 0.09 U1	< 0.04 U1
9/21/2022	Assessment	< 0.02 U1	0.17	108 P3	0.016 J1	0.007 J1	0.28	0.015 B1, J1	7.95	0.37	< 0.05 U1	0.0241	< 0.002 U1	0.5	< 0.09 U1	< 0.04 U1
3/7/2023	Assessment	< 0.02 U1	0.22	108	0.042 J1	0.012 J1	0.30	0.021	3.32	0.35	0.11 J1	0.0249	< 0.002 U1	0.9	< 0.09 U1	< 0.04 U1
6/20/2023	Assessment	0.034 J1	0.42	108	0.028 J1	0.016 J1	0.42	0.165	7.83	0.36	0.35	0.0246	< 0.002 U1	1.3	< 0.04 U1	< 0.02 U1
9/19/2023	Assessment	0.013 J1	0.26	101	0.019 J1	0.015 J1	0.35	0.040	6.82	0.34	0.07 J1	0.0244	< 0.002 U1	0.7	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: B-2**

**Flint Creek - LF**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	1.13	91.9	6	< 0.083 U1	7.0	619	1,212
7/19/2016	Background	1.33	59.9	7	0.3361 J1	6.7	464	936
9/14/2016	Background	1.19	62.6	7	< 0.083 U1	6.6	560	1,124
10/5/2016	Background	1.32	45.3	7	< 0.083 U1	5.9	339	741
11/8/2016	Background	1.82	27.5	6	< 0.083 U1	6.0	145	365
1/23/2017	Background	1.56	24	5	< 0.083 U1	5.8	119	296
3/7/2017	Background	1.04	32.1	5	< 0.083 U1	5.9	105	260
4/25/2017	Background	1.44	23.1	6	< 0.083 U1	6.3	179	400
5/15/2017	Background	1.33	20.7	6	< 0.083 U1	5.5	153	328
6/12/2017	Background	0.936	39.6	6	< 0.083 U1	5.9	109	278
8/29/2017	Detection	1.07	18	6	< 0.083 U1	6.0	116	270
12/21/2017	Detection	0.7	--	--	--	5.9	--	--
3/26/2018	Assessment	0.851	15.3	4	< 0.083 U1	6.7	138	324
8/27/2018	Assessment	0.702	56.3	--	--	6.7	--	532
10/23/2018	Assessment	--	--	10.8	< 0.083 U1	--	198	--
3/12/2019	Assessment	0.634	34.5	5.88	0.1 J1	6.9	129	376
6/11/2019	Assessment	0.697	14.2	4.16	0.06 J1	6.4	80.9	246
8/27/2019	Assessment	0.735	15.4	3	< 0.083 U1	5.9	65	230
12/9/2019	Assessment	--	--	--	--	6.6	--	--
3/24/2020	Assessment	--	--	2.81	0.07	5.7	68.1	168
6/24/2020	Assessment	0.355	30.7	5.36	0.09	6.2	84.9	252
10/19/2020	Assessment	0.504	33.9	4.10	0.07	5.5	110	304
3/1/2021	Assessment	--	--	--	0.11	6.1	--	--
6/21/2021	Assessment	0.480	23.0	3.68	0.11	5.7	60.9	230 P1
9/20/2021	Assessment	0.488	32.8	3.11	0.11	5.5	70.5	240
3/14/2022	Assessment	--	--	--	0.08	5.8	--	--
6/13/2022	Assessment	0.390	22.9	2.80	0.09	5.6	49.4	220
9/20/2022	Assessment	0.419	29.3	3.57	0.10	6.0	67.9	220
3/6/2023	Assessment	--	--	--	0.08	5.7	--	--
6/19/2023	Assessment	0.205	32.7	5.88	0.06	5.4	292	560
9/18/2023	Assessment	0.292	26.8	3.21	0.07	5.6	45.3	190

Table 1. Groundwater Data Summary: B-2

Flint Creek - LF

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	94	0.131152 J1	< 0.07 U1	4	0.952324 J1	1.06	< 0.083 U1	< 0.68 U1	0.009	0.02106 J1	6	82	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	114	0.297284 J1	< 0.07 U1	6	2.18888 J1	--	0.3361 J1	1.98005 J1	0.005	0.00946 J1	2.74335 J1	50	< 0.86 U1
9/14/2016	Background	1.81571 J1	8	226	1	0.348046 J1	26	15	1.752	< 0.083 U1	13	0.021	0.027	2.59675 J1	49	0.98925 J1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	73	0.168987 J1	< 0.07 U1	5	1.57645 J1	4.10	< 0.083 U1	1.52736 J1	0.016	< 0.005 U1	0.783837 J1	35	< 0.86 U1
11/8/2016	Background	1.15186 J1	17	543	3	0.870406 J1	37	31	3.87	< 0.083 U1	26	0.027	0.05	2.69221 J1	13	< 0.86 U1
1/23/2017	Background	1.32054 J1	2.57288 J1	214	0.763757 J1	< 0.07 U1	10	6	1.408	< 0.083 U1	4.36086 J1	0.007	0.01252 J1	0.832511 J1	9	< 0.86 U1
3/7/2017	Background	6	< 1.05 U1	70	0.157872 J1	< 0.07 U1	2	0.632449 J1	1.372	< 0.083 U1	< 0.68 U1	0.005	< 0.005 U1	0.478127 J1	20	< 0.86 U1
4/25/2017	Background	< 0.93 U1	1.39 J1	97.47	0.22 J1	0.08 J1	3.44	1.24 J1	1.881	< 0.083 U1	1.32 J1	0.00242	< 0.005 U1	0.77 J1	9.94	< 0.86 U1
5/15/2017	Background	1.17 J1	1.77 J1	51.22	0.17 J1	< 0.07 U1	2.49	0.47 J1	1.429	< 0.083 U1	0.8 J1	0.00161	< 0.005 U1	0.34 J1	9.52	< 0.86 U1
6/12/2017	Background	< 0.93 U1	1.08 J1	79.45	0.17 J1	0.09 J1	3.76	1.67 J1	1.839	< 0.083 U1	0.8 J1	0.00287	< 0.005 U1	2.1 J1	20.57	< 0.86 U1
3/26/2018	Assessment	1.6 J1	1.44 J1	62.23	0.15 J1	< 0.07 U1	2.15	0.62 J1	2.018	< 0.083 U1	< 0.68 U1	0.0023	< 0.005 U1	< 0.29 U1	8.63	0.88 J1
8/27/2018	Assessment	0.02 J1	0.67	62.7	0.062	0.05	2.17	0.371	2.403	--	0.332	0.00172	0.005 J1	4.42	27.3	0.066
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.4 J1	63.9	0.1 J1	0.06 J1	2.83	0.2 J1	1.93	0.1 J1	0.2 J1	0.00188	< 0.005 U1	< 2 U1	14.3	< 0.5 U1
6/11/2019	Assessment	< 0.02 U1	0.18	38.5	0.208	0.04 J1	1.57	0.069	0.959	0.06 J1	< 0.05 U1	< 0.02 U1	< 0.005 U1	0.4 J1	6.7	< 0.1 U1
8/27/2019	Assessment	< 0.02 U1	0.22	41.3	0.149	0.03 J1	1.75	0.105	0.888	< 0.083 U1	0.08 J1	0.00128	< 0.005 U1	0.5 J1	6.8	< 0.1 U1
3/24/2020	Assessment	0.02 J1	0.16	36.0	0.130	0.03 J1	1.37	0.053	1.077	0.07	< 0.05 U1	0.00109	< 0.002 U1	0.8 J1	5.2	< 0.1 U1
6/24/2020	Assessment	< 0.02 U1	0.21	71.6	0.07 J1	0.03 J1	1.74	0.055	1.974	0.09	< 0.05 U1	0.00132	< 0.002 U1	2 J1	8.4	< 0.1 U1
10/19/2020	Assessment	0.02 J1	0.26	73.0	0.08 J1	0.04 J1	1.56	0.131	1.715	0.07	0.1 J1	0.00126	< 0.002 U1	1 J1	12.3	< 0.1 U1
3/1/2021	Assessment	0.04 J1	0.24	46.6	0.08 J1	0.02 J1	1.35	0.136	1.498	0.11	0.1 J1	0.000946	< 0.002 U1	1 J1	5.7	< 0.1 U1
6/21/2021	Assessment	0.02 J1	0.17	51.0	0.090	0.022	1.35	0.092	0.57	0.11	0.08 J1	0.0010	< 0.002 U1	1.2	5.81	0.04 J1
9/20/2021	Assessment	0.02 J1	0.23	61.1	0.052 P2	0.014 J1	1.45	0.108	1.37	0.11	0.07 J1	0.00090 P2	< 0.002 U1	1.9	8.37	< 0.04 U1
3/14/2022	Assessment	0.02 J1	0.22	45.4	0.083	0.019 J1	1.38	0.095	1.83	0.08	0.06 J1	0.00095	< 0.002 U1	1.1	5.88	< 0.04 U1
6/13/2022	Assessment	< 0.02 U1	0.20	49.3	0.069	0.019 J1	1.31	0.074	0.60	0.09	< 0.05 U1	0.00090	< 0.002 U1	1.3	5.20	0.05 J1
9/20/2022	Assessment	< 0.02 U1	0.23	58.6	0.059	0.024	1.57	0.079 B1	2.53	0.10	< 0.05 U1	0.00102	< 0.002 U1	1.5	7.32	0.05 J1
3/6/2023	Assessment	0.05 J1	0.28	46.9	0.106	0.029	1.54	0.295	1.60	0.08	0.29	0.00103	< 0.002 U1	1.4	4.20	< 0.04 U1
6/19/2023	Assessment	0.028 J1	0.42	208	0.155	0.046	1.52	0.291	1.59	0.06	0.33	0.00208	0.002 J1	0.6	11.3	0.03 J1
9/18/2023	Assessment	0.018 J1	0.15	63.7	0.057	0.021	1.47	0.082	2.09	0.07	0.08 J1	0.00132	< 0.002 U1	0.6	3.60	0.02 J1



**Table 1. Groundwater Data Summary: B-4  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.03	8.23	8	< 0.083 U1	7.0	14	92
7/19/2016	Background	0.03	8.86	9	< 0.083 U1	6.7	12	75
9/14/2016	Background	0.03	19.4	8	< 0.083 U1	6.8	8	128
10/5/2016	Background	0.02	8.22	10	< 0.083 U1	6.2	13	78
11/7/2016	Background	0.04	13.3	9	< 0.083 U1	6.7	10	72
1/24/2017	Background	0.04	23.6	8	< 0.083 U1	6.8	5	84
3/7/2017	Background	0.02	22.8	8	< 0.083 U1	7.1	5	52
4/25/2017	Background	0.0382	32.4	9	< 0.083 U1	6.9	8	86
5/15/2017	Background	0.03844	15.5	8	< 0.083 U1	7.2	10	88
6/13/2017	Background	0.0588	7.13	9	< 0.083 U1	7.4	11	76
8/29/2017	Detection	0.04762	5.5	8	< 0.083 U1	7.2	8	60
3/26/2018	Assessment	0.03141	6.06	5	< 0.083 U1	7.4	10	72
8/28/2018	Assessment	0.030	8.23	--	--	7.6	--	44
10/23/2018	Assessment	--	--	9.61	< 0.083 U1	--	13.6	--
3/12/2019	Assessment	0.036	3.37	4.58	0.02 J1	7.5	12.1	68
6/11/2019	Assessment	0.07 J1	3.50	3.74	0.02 J1	7.5	13.4	60
8/28/2019	Assessment	0.056	2.92	3	< 0.083 U1	6.0	11	66
3/23/2020	Assessment	--	--	2.14	0.02 J1	6.7	15.4	58
6/24/2020	Assessment	0.107	2.93	1.92	0.02 J1	6.6	15.3	57
10/19/2020	Assessment	0.070	2.61	2.33	0.02 J1	6.2	11.2	64
3/1/2021	Assessment	--	--	--	0.03 J1	6.0	--	--
6/22/2021	Assessment	0.10	3.2	2.38	0.02 J1	5.6	12.4	70
9/20/2021	Assessment	0.030 J1	49.8	4.50	0.03 J1	6.3	5.88	110
3/14/2022	Assessment	--	--	--	0.02 J1	6.5	--	--
6/13/2022	Assessment	0.092	5.81	2.42	0.02 J1	6.1	11.3	80
9/20/2022	Assessment	0.078	15.1	3.05	0.02 J1	6.2	9.48	80
3/6/2023	Assessment	--	--	--	< 0.02 U1	6.4	--	--
6/19/2023	Assessment	0.019 J1	38.1	5.29	< 0.02 U1	6.2	5.0	140
9/18/2023	Assessment	0.030 J1	29.9	4.79	0.03 J1	6.2	4.4	120

Table 1. Groundwater Data Summary: B-4

Flint Creek - LF  
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	49	0.205178 J1	< 0.07 U1	1	0.36974 J1	0.734	< 0.083 U1	< 0.68 U1	< 0.00013 U1	0.01529 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	49	0.211526 J1	< 0.07 U1	1	0.15016 J1	--	< 0.083 U1	< 0.68 U1	0.002	0.00738 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	65	0.037683 J1	< 0.07 U1	2	0.4142 J1	8.344	< 0.083 U1	1.16564 J1	0.001	< 0.005 U1	< 0.29 U1	< 0.99 U1	0.918935 J1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	71	0.439546 J1	< 0.07 U1	5	2.34157 J1	3.969	< 0.083 U1	1.65693 J1	0.009	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/7/2016	Background	< 0.93 U1	1.75787 J1	62	0.382027 J1	0.130549 J1	4	1.2283 J1	0.351	< 0.083 U1	0.943091 J1	0.003	0.00809 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/24/2017	Background	2.63622 J1	< 1.05 U1	60	0.210311 J1	< 0.07 U1	2	0.749001 J1	0.945	< 0.083 U1	< 0.68 U1	0.001	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	1.09461 J1	< 1.05 U1	51	0.24192 J1	< 0.07 U1	1	0.605358 J1	1.588	< 0.083 U1	< 0.68 U1	0.003	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/25/2017	Background	< 0.93 U1	< 1.05 U1	63.66	0.08 J1	< 0.07 U1	0.91 J1	0.28 J1	0.679	< 0.083 U1	0.87 J1	0.00083 J1	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	< 1.05 U1	70.02	0.09 J1	< 0.07 U1	0.99 J1	< 0.14 U1	2.89	< 0.083 U1	< 0.68 U1	0.00077 J1	0.005 J1	< 0.29 U1	1.11 J1	< 0.86 U1
6/13/2017	Background	4.52 J1	1.18 J1	49.29	0.22 J1	0.08 J1	0.82 J1	0.19 J1	3.373	< 0.083 U1	< 0.68 U1	0.00119	< 0.005 U1	< 0.29 U1	< 0.99 U1	0.9 J1
3/26/2018	Assessment	2.1 J1	< 1.05 U1	46.33	0.09 J1	< 0.07 U1	0.99 J1	0.18 J1	2.309	< 0.083 U1	< 0.68 U1	0.00114	< 0.005 U1	< 0.29 U1	1.94 J1	< 0.86 U1
8/28/2018	Assessment	0.01 J1	0.17	40.5	0.208	0.13	1.03	0.184	0.3669	--	0.184	0.00110	< 0.005 U1	0.07 J1	0.8	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	< 0.2 U1	34.3	0.2 J1	0.1 J1	1.26	< 0.1 U1	0.2946	0.02 J1	< 0.1 U1	0.00123	< 0.005 U1	< 2 U1	0.6 J1	< 0.5 U1
6/11/2019	Assessment	< 0.02 U1	0.06 J1	31.2	0.215	0.05 J1	1.03	0.04 J1	0.68	0.02 J1	< 0.05 U1	< 0.02 U1	< 0.005 U1	< 0.4 U1	0.7	< 0.1 U1
8/28/2019	Assessment	< 0.02 U1	0.06 J1	31.1	0.204	0.04 J1	1.11	0.084	1.053	< 0.083 U1	< 0.05 U1	0.000925	< 0.005 U1	< 0.4 U1	0.8	< 0.1 U1
3/23/2020	Assessment	0.03 J1	0.25	35.7	0.198	0.14	0.724	0.133	0.404	0.02 J1	0.396	0.000877	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
6/24/2020	Assessment	< 0.02 U1	0.06 J1	38.7	0.169	0.04 J1	0.805	0.059	0.646	0.02 J1	< 0.05 U1	0.000964	0.002 J1	< 0.4 U1	0.5	< 0.1 U1
10/19/2020	Assessment	< 0.02 U1	0.05 J1	28.7	0.204	0.03 J1	0.847	0.04 J1	1.898	0.02 J1	< 0.05 U1	0.000934	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
3/1/2021	Assessment	< 0.02 U1	0.09 J1	43.9	0.101	0.03 J1	0.744	0.04 J1	0.887	0.03 J1	< 0.05 U1	0.000761	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
6/22/2021	Assessment	< 0.02 U1	0.09 J1	37.2	0.176	0.038	1.03	0.094	1.05	0.02 J1	0.23	0.00083	< 0.002 U1	< 0.1 U1	0.53	< 0.04 U1
9/20/2021	Assessment	0.61	0.14	42.2	0.074 P2	0.052	1.14	0.091	0.67	0.03 J1	3.89	0.00056 P2	< 0.002 U1	< 0.1 U1	0.40 J1	< 0.04 U1
3/14/2022	Assessment	< 0.02 U1	0.08 J1	51.5	0.113	0.030	0.96	0.043	1.02	0.02 J1	< 0.05 U1	0.00076	< 0.002 U1	< 0.1 U1	0.40 J1	< 0.04 U1
6/13/2022	Assessment	< 0.02 U1	0.04 J1	50.8	0.176	0.036	0.84	0.044	0.81	0.02 J1	< 0.05 U1	0.00084	< 0.002 U1	2.8	0.37 J1	< 0.04 U1
9/20/2022	Assessment	< 0.02 U1	0.07 J1	56.3	0.172	0.032	0.82	0.048 B1	1.23	0.02 J1	< 0.05 U1	0.00089	< 0.002 U1	< 0.1 U1	0.38 J1	< 0.04 U1
3/6/2023	Assessment	< 0.02 U1	0.03 J1	41.1	0.246	0.030	1.0	0.041	1.85	< 0.02 U1	< 0.05 U1	0.00106	< 0.002 U1	< 0.1 U1	0.40 J1	< 0.04 U1
6/19/2023	Assessment	0.013 J1	0.12	49.8	0.081	0.028	0.91	0.10	0.75	< 0.02 U1	0.14 J1	0.00070	< 0.002 U1	< 0.1 U1	0.50	0.02 J1
9/18/2023	Assessment	0.010 J1	0.06 J1	45.2	0.107	0.022	0.86	0.040	0.87	0.03 J1	< 0.05 U1	0.00084	< 0.002 U1	< 0.1 U1	0.32 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: B-5  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.01	17.4	6	< 0.083 U1	5.1	189	424
7/19/2016	Background	0.01	16.2	7	< 0.083 U1	5.2	205	424
9/14/2016	Background	0.01	17.6	7	< 0.083 U1	6.4	187	372
10/4/2016	Background	0.01	18.7	12	0.2728 J1	6.5	197	404
11/8/2016	Background	0.02	15.9	9	< 0.083 U1	6.6	160	352.94
1/23/2017	Background	0.02	18	6	< 0.083 U1	5.6	212	404
3/7/2017	Background	0.02	16.9	6	< 0.083 U1	5.1	200	392
4/25/2017	Background	0.02255	17.6	7	< 0.083 U1	5.9	226	422
5/16/2017	Background	0.01833	18.3	7	< 0.083 U1	4.9	229	416
6/13/2017	Background	0.03663	17	8	< 0.083 U1	5.0	206	410
8/29/2017	Detection	0.03455	16.4	8	< 0.083 U1	5.4	199	376
3/28/2018	Assessment	0.01591	15.5	6	< 0.083 U1	5.4	169	372
8/28/2018	Assessment	0.014	16.5	--	--	5.5	--	396
10/23/2018	Assessment	--	--	10	< 0.083 U1	--	216	--
3/12/2019	Assessment	0.01 J1	16.2	8.30	0.07 J1	5.3	205	372
6/11/2019	Assessment	< 0.04 U1	17.9	7.02	0.08	5.7	271	438
8/28/2019	Assessment	< 0.02 U1	15.9	6	< 0.083 U1	5.0	219	402
3/23/2020	Assessment	--	--	7.75	0.07	4.7	255	418
6/24/2020	Assessment	< 0.02 U1	16.1	8.12	0.05 J1	5.5	249	406
10/19/2020	Assessment	< 0.02 U1	17.3	8.00	0.06	4.6	258	445
3/2/2021	Assessment	--	--	--	0.08	4.8	--	--
6/22/2021	Assessment	< 0.009 U1	15.6	9.16	0.07	4.9	248	410
9/21/2021	Assessment	< 0.009 U1	15.8	9.07	0.07	5.5	254	420
3/15/2022	Assessment	--	--	--	0.06	5.1	--	--
6/13/2022	Assessment	< 0.009 U1	15.5	9.65	0.07	5.4	248	430
9/21/2022	Assessment	< 0.009 U1	15.1	9.93	0.07	5.8	255	410
3/7/2023	Assessment	--	--	--	0.05 J1	5.7	--	--
6/20/2023	Assessment	0.007 J1	15.2	9.66	0.05 J1	5.3	257	430
9/19/2023	Assessment	0.009 J1	14.2	9.40	0.06	5.6	250	430

Table 1. Groundwater Data Summary: B-5

Flint Creek - LF  
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	49	0.538281 J1	0.130546 J1	3	0.63546 J1	0.700	< 0.083 U1	< 0.68 U1	0003225069333	0.035	< 0.29 U1	36	1.07783 J1
7/19/2016	Background	< 0.93 U1	1.09501 J1	53	0.578371 J1	< 0.07 U1	2	0.670288 J1	--	< 0.083 U1	0.951208 J1	0.003	0.01341 J1	< 0.29 U1	37	< 0.86 U1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	59	0.421905 J1	0.107531 J1	3	0.632453 J1	0.7219	< 0.083 U1	< 0.68 U1	0.003	0.01083 J1	< 0.29 U1	37	< 0.86 U1
10/4/2016	Background	< 0.93 U1	< 1.05 U1	70	0.70802 J1	0.0937694 J1	6	2.24689 J1	4.38	0.2728 J1	2.22182 J1	0.014	0.049	< 0.29 U1	39	< 0.86 U1
11/8/2016	Background	< 0.93 U1	< 1.05 U1	64	0.556725 J1	1	4	0.96226 J1	0.673	< 0.083 U1	< 0.68 U1	0.003	0.02149 J1	< 0.29 U1	33	< 0.86 U1
1/23/2017	Background	< 0.93 U1	< 1.05 U1	60	0.634776 J1	0.136621 J1	5	1.12636 J1	1.222	< 0.083 U1	< 0.68 U1	0.003	0.053	< 0.29 U1	38	1.02071 J1
3/7/2017	Background	< 0.93 U1	< 1.05 U1	42	0.548248 J1	< 0.07 U1	3	0.601941 J1	0.557	< 0.083 U1	< 0.68 U1	0.002	0.0138 J1	< 0.29 U1	36	< 0.86 U1
4/25/2017	Background	1.24 J1	1.87 J1	36.3	0.56 J1	0.15 J1	3.27	0.92 J1	0.698	< 0.083 U1	< 0.68 U1	0.003	0.013 J1	< 0.29 U1	37.33	< 0.86 U1
5/16/2017	Background	< 0.93 U1	1.16 J1	38.38	0.65 J1	0.08 J1	3.63	0.84 J1	4.934	< 0.083 U1	< 0.68 U1	0.00348	0.013 J1	< 0.29 U1	39.1	< 0.86 U1
6/13/2017	Background	< 0.93 U1	< 1.05 U1	37.52	0.6 J1	0.07 J1	3.33	0.63 J1	8.709	< 0.083 U1	< 0.68 U1	0.00323	0.008 J1	< 0.29 U1	36.88	< 0.86 U1
3/28/2018	Assessment	4.41 J1	< 1.05 U1	42.4	0.46 J1	0.27 J1	2.38	0.63 J1	0.721	< 0.083 U1	0.74 J1	0.00263	0.015 J1	< 0.29 U1	35.97	1.16 J1
8/28/2018	Assessment	0.04 J1	0.88	45.0	0.525	0.19	3.01	0.414	1.501	--	0.482	0.00223	0.096	0.06 J1	38.7	0.070
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	0.2 J1	0.62	80.5	0.638	0.56	2.89	0.477	0.969	0.07 J1	0.833	0.00274	0.028	< 2 U1	39.2	< 0.5 U1
6/11/2019	Assessment	< 0.02 U1	0.67	26.0	0.376	0.18	3.00	0.349	1.27	0.08	0.203	< 0.02 U1	0.007 J1	< 0.4 U1	39.0	< 0.1 U1
8/28/2019	Assessment	< 0.02 U1	0.44	33.7	0.487	0.18	2.40	0.331	0.717	< 0.083 U1	0.1 J1	0.00215	0.006 J1	< 0.4 U1	37.5	< 0.1 U1
3/23/2020	Assessment	< 0.02 U1	0.33	22.4	0.491	0.16	2.35	0.271	0.6329	0.07	0.1 J1	0.00235	0.003 J1	< 0.4 U1	35.0	< 0.1 U1
6/24/2020	Assessment	< 0.02 U1	0.38	20.1	0.473	0.15	2.42	0.259	0.821	0.05 J1	0.1 J1	0.00232	0.004 J1	< 0.4 U1	35.0	< 0.1 U1
10/19/2020	Assessment	0.02 J1	0.43	19.1	0.502	0.16	2.41	0.291	2.622	0.06	0.2 J1	0.00226	0.005	< 0.4 U1	37.4	< 0.1 U1
3/2/2021	Assessment	< 0.02 U1	0.43	18.3	0.477	0.16	2.50	0.284	0.714	0.08	0.2 J1	0.00227	0.004 J1	< 0.4 U1	36.2	< 0.1 U1
6/22/2021	Assessment	< 0.02 U1	0.33	20.0	0.482	0.174	2.45	0.259	1.10	0.07	0.20	0.00232	0.004 J1	< 0.1 U1	38.6	< 0.04 U1
9/21/2021	Assessment	< 0.02 U1	0.40	18.7	0.480 P2	0.149	2.53	0.260	0.88	0.07	0.18 J1	0.00226 P2	0.006	< 0.1 U1	36.4	< 0.04 U1
3/15/2022	Assessment	0.04 J1	0.54	23.2	0.485	0.171	2.75	0.280	2.62	0.06	0.18 J1	0.00230	0.008	< 0.1 U1	37.1	< 0.04 U1
6/13/2022	Assessment	0.05 J1	0.72	42.6	0.467	0.169	2.99	0.390	1.46	0.07	0.57	0.00242	0.080	1.1	36.0	0.04 J1
9/21/2022	Assessment	< 0.02 U1	0.47	18.6	0.478	0.159	2.61	0.247 B1	2.33	0.07	0.11 J1	0.00227	0.004 J1	< 0.1 U1	36.3	< 0.04 U1
3/7/2023	Assessment	< 0.02 U1	0.26	17.6	0.434	0.162	2.41	0.220	1.38	0.05 J1	0.52	0.00214	0.004 J1	< 0.1 U1	34.6	< 0.04 U1
6/20/2023	Assessment	0.059 J1	0.36	21.4	0.514	0.223	2.38	0.244	5.48	0.05 J1	0.20	0.00224	0.013	< 0.1 U1	35.0	0.03 J1
9/19/2023	Assessment	0.014 J1	0.38	18.0	0.469	0.152	2.44	0.216	0.56	0.06	0.17 J1	0.00226	0.006	< 0.1 U1	33.0	0.04 J1

**Table 1. Groundwater Data Summary: B-6  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.05	36.9	6	< 0.083 U1	6.7	19	180
7/19/2016	Background	0.06	49.5	8	< 0.083 U1	7.2	24	208
9/14/2016	Background	0.06	52.3	8	< 0.083 U1	6.6	38	232
10/5/2016	Background	0.06	44.7	8	< 0.083 U1	7.0	29	220
11/8/2016	Background	0.06	40	7	< 0.083 U1	6.9	29	208
1/24/2017	Background	0.08	51.9	7	< 0.083 U1	7.0	34	244
3/6/2017	Background	0.06	43	6	< 0.083 U1	7.0	24	178
4/25/2017	Background	0.05207	56.5	8	< 0.083 U1	6.2	37	238
5/15/2017	Background	0.04277	48.6	7	< 0.083 U1	6.5	24	206
6/12/2017	Background	0.05859	53.8	8	< 0.083 U1	6.6	26	252
8/28/2017	Detection	0.06251	37	8	0.2066 J1	7.0	16	162
12/21/2017	Detection	0.06498	--	--	--	7.0	--	--
3/26/2018	Assessment	0.04773	34	6	< 0.083 U1	6.4	13	156
8/28/2018	Assessment	0.050	34.6	--	--	6.4	--	144
10/23/2018	Assessment	--	--	12.2	< 0.083 U1	--	24.6	--
3/12/2019	Assessment	0.037	41.9	8.16	< 0.04 U1	6.9	17.1	100
6/10/2019	Assessment	0.05 J1	49.7	7.78	0.03 J1	6.8	21.7	188
8/27/2019	Assessment	0.03 J1	44.8	6	< 0.083 U1	6.6	36	250
3/24/2020	Assessment	--	--	7.31	0.02 J1	6.6	16.9	202
6/23/2020	Assessment	0.02 J1	37.8	7.25	0.02 J1	6.8	10.8	140
10/19/2020	Assessment	0.03 J1	43.8	7.52	0.02 J1	6.3	16.5	201
3/1/2021	Assessment	--	--	--	0.03 J1	6.6	--	--
6/21/2021	Assessment	0.029 J1	34.0	6.95	0.03 J1	6.1	9.93	150
9/20/2021	Assessment	0.027 J1	37.2	6.55	0.02 J1	5.8	13.3	160
3/14/2022	Assessment	--	--	--	< 0.02 U1	6.3	--	--
6/13/2022	Assessment	0.019 J1	41.8	7.23	0.02 J1	6.2	14.9	180 S7
9/20/2022	Assessment	0.024 J1	36.7 M1, P3	6.66	0.02 J1	6.1	15.1	170
3/6/2023	Assessment	--	--	--	< 0.02 U1	6.3	--	--
6/19/2023	Assessment	0.034 J1	56.2	6.23	< 0.02 U1	6.2	47.5	230
9/18/2023	Assessment	0.044 J1	50.5	7.83	0.03 J1	6.1	25.1	230

Table 1. Groundwater Data Summary: B-6

## Flint Creek - LF

## Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	42	0.0329713 J1	< 0.07 U1	2	0.5336 J1	0.625	< 0.083 U1	< 0.68 U1	0.000846322 J1	0.0121 J1	< 0.29 U1	1.38371 J1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	60	0.169224 J1	< 0.07 U1	3	1.23508 J1	--	< 0.083 U1	0.848543 J1	0.002	0.00953 J1	0.863908 J1	3.30254 J1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	65	< 0.02 U1	< 0.07 U1	4	1.26649 J1	1.556	< 0.083 U1	1.53065 J1	0.002	< 0.005 U1	< 0.29 U1	3.35098 J1	< 0.86 U1
10/5/2016	Background	< 0.93 U1	3.63583 J1	87	0.559451 J1	0.268209 J1	11	4.75063 J1	7.58	< 0.083 U1	4.70003 J1	0.016	0.01261 J1	0.732328 J1	3.04012 J1	< 0.86 U1
11/8/2016	Background	< 0.93 U1	< 1.05 U1	58	0.134729 J1	0.116659 J1	5	1.68272 J1	0.846	< 0.083 U1	1.07347 J1	0.002	0.01235 J1	< 0.29 U1	2.02161 J1	< 0.86 U1
1/24/2017	Background	< 0.93 U1	< 1.05 U1	76	0.216535 J1	< 0.07 U1	6	2.57434 J1	1.415	< 0.083 U1	1.31013 J1	0.003	0.00759 J1	0.868445 J1	1.16358 J1	< 0.86 U1
3/6/2017	Background	< 0.93 U1	< 1.05 U1	55	0.140509 J1	< 0.07 U1	4	1.95733 J1	0.705	< 0.083 U1	2.18218 J1	0.004	0.00738 J1	0.328653 J1	1.0391 J1	< 0.86 U1
4/25/2017	Background	< 0.93 U1	1.89 J1	75.05	0.26 J1	0.16 J1	6.35	2.74 J1	0.671	< 0.083 U1	2.44 J1	0.0038	0.008 J1	0.62 J1	4.5 J1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	1.49 J1	59.86	0.12 J1	< 0.07 U1	3.12	1.16 J1	13.943	< 0.083 U1	1.16 J1	0.00182	< 0.005 U1	0.43 J1	1.04 J1	< 0.86 U1
6/12/2017	Background	< 0.93 U1	1.5 J1	65.93	0.16 J1	< 0.07 U1	4.2	1.58 J1	1.14	< 0.083 U1	1.03 J1	0.00238	< 0.005 U1	0.5 J1	< 0.99 U1	1.16 J1
3/26/2018	Assessment	1.45 J1	1.46 J1	56.88	0.1 J1	0.27 J1	4.42	1.8 J1	1.055	< 0.083 U1	2.42 J1	0.00281	0.005 J1	0.58 J1	2.87 J1	1.32 J1
8/28/2018	Assessment	0.01 J1	0.14	41.3	0.007 J1	0.02 J1	1.73	0.022	0.567	--	0.005 J1	0.000415	0.007 J1	0.54	1.7	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.61	48.3	< 0.1 U1	< 0.05 U1	2.32	0.597	0.571	< 0.04 U1	0.748	0.0009 J1	< 0.005 U1	< 2 U1	2.2	< 0.5 U1
6/10/2019	Assessment	0.08 J1	0.51	49.8	0.08 J1	0.08 J1	2.18	0.537	0.8101	0.03 J1	0.697	< 0.02 U1	< 0.005 U1	< 0.8 U1	2.4	< 0.2 U1
8/27/2019	Assessment	0.05 J1	0.36	48.6	0.04 J1	0.04 J1	1.96	0.387	0.347	< 0.083 U1	0.509	0.000518	< 0.005 U1	< 0.4 U1	2.4	< 0.1 U1
3/24/2020	Assessment	0.03 J1	0.37	47.3	0.04 J1	0.02 J1	1.53	0.291	3.448	0.02 J1	0.403	0.000636	0.002 J1	< 0.4 U1	1.6	< 0.1 U1
6/23/2020	Assessment	< 0.02 U1	0.15	41.6	< 0.02 U1	0.01 J1	1.19	0.053	0.457	0.02 J1	0.06 J1	0.000456	< 0.002 U1	< 0.4 U1	0.9	< 0.1 U1
10/19/2020	Assessment	< 0.02 U1	0.16	45.4	< 0.02 U1	0.01 J1	1.60	0.054	1.203	0.02 J1	0.06 J1	0.000407	< 0.002 U1	< 0.4 U1	1.6	< 0.1 U1
3/1/2021	Assessment	< 0.02 U1	0.20	41.6	< 0.02 U1	0.01 J1	1.66	0.123	0.147	0.03 J1	0.1 J1	0.000390	< 0.002 U1	< 0.4 U1	1.5	< 0.1 U1
6/21/2021	Assessment	< 0.02 U1	0.19	40.7	0.022 J1	0.018 J1	1.52	0.125	0.63	0.03 J1	0.15 J1	0.00055	< 0.002 U1	0.2 J1	1.07	< 0.04 U1
9/20/2021	Assessment	< 0.02 U1	0.17	37.9	0.009 P2, J1	< 0.004 U1	1.91	0.079	0.81	0.02 J1	0.07 J1	0.00037 P2	< 0.002 U1	0.2 J1	1.51	< 0.04 U1
3/14/2022	Assessment	< 0.02 U1	0.25	40.5	0.016 J1	0.011 J1	2.22	0.155	1.81	< 0.02 U1	0.14 J1	0.00038	< 0.002 U1	0.2 J1	1.94	< 0.04 U1
6/13/2022	Assessment	< 0.02 U1	0.18	42.7	0.010 J1	0.01 J1	1.48	0.081	1.08	0.02 J1	0.08 J1	0.00037	< 0.002 U1	0.2 J1	1.29	< 0.04 U1
9/20/2022	Assessment	< 0.02 U1	0.16	37.8 P3	0.010 J1	0.011 J1	1.95	0.081 B1	1.05	0.02 J1	0.06 J1	0.00034	< 0.002 U1	0.2 J1	1.53	< 0.04 U1
3/6/2023	Assessment	0.04 J1	0.19	48.4	0.042 J1	0.011 J1	1.66	0.114	1.30	< 0.02 U1	0.28	0.00032	< 0.002 U1	0.2 J1	3.39	< 0.04 U1
6/19/2023	Assessment	0.022 J1	0.29	50.4	0.038 J1	0.019 J1	2.17	0.253	1.16	< 0.02 U1	0.31	0.00044	< 0.002 U1	0.2 J1	4.39	< 0.02 U1
9/18/2023	Assessment	0.021 J1	0.25	59.3	0.030 J1	0.015 J1	1.63	0.195	0.47	0.03 J1	0.25	0.00063	< 0.002 U1	0.4 J1	2.04	< 0.02 U1

**Table 1. Groundwater Data Summary: B-7A  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.02	95.1	3	< 0.083 U1	6.7	29	320
7/19/2016	Background	0.02	98.1	4	0.3892 J1	7.2	34	314
9/14/2016	Background	0.02	100	4	< 0.083 U1	7.2	33	304
10/5/2016	Background	0.02	97.1	5	0.3235 J1	7.6	33	312
11/8/2016	Background	0.02	100	4	< 0.083 U1	7.5	32	332
1/24/2017	Background	0.02	102	3	< 0.083 U1	7.3	34	314
3/6/2017	Background	0.02	105	3	< 0.083 U1	7.1	33	296
4/25/2017	Background	0.01786	101	5	< 0.083 U1	7.0	34	298
5/15/2017	Background	0.01605	107	4	< 0.083 U1	6.9	35	306
6/12/2017	Background	0.03032	106	5	< 0.083 U1	6.8	35	320
8/28/2017	Detection	0.03116	102	5	0.274 J1	--	33	304
3/26/2018	Assessment	0.01576	100	3	< 0.083 U1	7.1	33	300
8/28/2018	Assessment	0.018	105	--	--	7.7	--	314
10/23/2018	Assessment	--	--	7.28	< 0.083 U1	--	35.6	--
3/11/2019	Assessment	0.02 J1	99.6	3.43	0.24	7.5	30.7	336
6/10/2019	Assessment	< 0.04 U1	105	3.12	0.24	7.1	35.4	312
8/27/2019	Assessment	< 0.02 U1	102	2	0.144 J1	8.3	36	378
3/24/2020	Assessment	--	--	3.17	0.22	8.4	34.8	304
6/23/2020	Assessment	< 0.02 U1	93.4	3.13	0.19	8.2	35.5	286
10/19/2020	Assessment	< 0.02 U1	97.0	3.03	0.21	8.5	33.9	320
3/1/2021	Assessment	--	--	--	0.25	7.3	--	--
6/21/2021	Assessment	0.015 J1	93.0	3.23	0.25	7.4	33.5	320
9/21/2021	Assessment	0.011 J1	100	3.02	0.20	7.8	33.0	300
3/14/2022	Assessment	--	--	--	0.20	7.4	--	--
6/13/2022	Assessment	< 0.009 U1	78.7 M1	3.09	0.21	7.5	33.8	320
9/20/2022	Assessment	0.013 J1	88.0	3.12	0.19	7.2	34.8	300
3/6/2023	Assessment	--	--	--	0.17	7.1	--	--
6/19/2023	Assessment	0.011 J1	85.3 M1	3.18	0.18	7.4	33.2	310
9/19/2023	Assessment	0.014 J1	92.4	2.98	0.17	7.4	33.1	300

Table 1. Groundwater Data Summary: B-7A

Flint Creek - LF  
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	60	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.648714 J1	2.556	< 0.083 U1	< 0.68 U1	0.021	0.033	0.838425 J1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	1.33211 J1	60	0.0763658 J1	< 0.07 U1	0.240969 J1	0.345176 J1	--	0.3892 J1	0.791157 J1	0.022	0.034	0.619545 J1	< 0.99 U1	1.98498 J1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	69	< 0.02 U1	< 0.07 U1	0.354374 J1	0.39525 J1	3.54	< 0.083 U1	< 0.68 U1	0.021	0.00796 J1	0.476503 J1	< 0.99 U1	< 0.86 U1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	66	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.842911 J1	7.97	0.3235 J1	< 0.68 U1	0.034	< 0.005 U1	0.68021 J1	< 0.99 U1	< 0.86 U1
11/8/2016	Background	< 0.93 U1	1.1401 J1	65	< 0.02 U1	< 0.07 U1	0.28162 J1	0.667484 J1	2.247	< 0.083 U1	< 0.68 U1	0.017	0.00705 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/24/2017	Background	< 0.93 U1	< 1.05 U1	65	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.352624 J1	2.311	< 0.083 U1	< 0.68 U1	0.015	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/6/2017	Background	< 0.93 U1	< 1.05 U1	62	< 0.02 U1	< 0.07 U1	0.432618 J1	0.458003 J1	3.154	< 0.083 U1	< 0.68 U1	0.022	0.00621 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/25/2017	Background	< 0.93 U1	< 1.05 U1	68.64	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.64 J1	1.934	< 0.083 U1	< 0.68 U1	0.01501	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	1.25 J1	59.92	< 0.02 U1	< 0.07 U1	0.24 J1	0.56 J1	2.714	< 0.083 U1	< 0.68 U1	0.01509	0.008 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/12/2017	Background	< 0.93 U1	< 1.05 U1	56.32	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.43 J1	3.072	< 0.083 U1	1.74 J1	0.01452	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/26/2018	Assessment	1.28 J1	1.85 J1	51.94	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.24 J1	3.93	< 0.083 U1	< 0.68 U1	0.0191	< 0.005 U1	0.29 J1	< 0.99 U1	< 0.86 U1
8/28/2018	Assessment	0.02 J1	1.59	52.4	0.01 J1	0.03	0.071	0.400	2.861	--	0.156	0.0158	< 0.005 U1	0.63	0.04 J1	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/11/2019	Assessment	< 0.1 U1	3.15	74.8	< 0.1 U1	0.05 J1	1.95	0.351	1.962	0.24	0.2 J1	0.0200	< 0.005 U1	< 2 U1	< 0.2 U1	< 0.5 U1
6/10/2019	Assessment	0.06 J1	2.35	42.9	< 0.02 U1	0.02 J1	< 0.04 U1	0.074	2.561	0.24	0.1 J1	< 0.02 U1	< 0.005 U1	0.5 J1	< 0.03 U1	< 0.1 U1
8/27/2019	Assessment	0.15	2.93	49.0	< 0.02 U1	0.03 J1	0.2 J1	0.134	1.853	0.144 J1	0.1 J1	0.0164	< 0.005 U1	0.6 J1	0.04 J1	< 0.1 U1
3/24/2020	Assessment	0.07 J1	2.13	50.1	< 0.02 U1	0.17	0.09 J1	0.237	2.876	0.22	0.1 J1	0.0181	< 0.002 U1	0.7 J1	0.1 J1	< 0.1 U1
6/23/2020	Assessment	0.09 J1	3.75	48.5	< 0.02 U1	0.03 J1	0.1 J1	0.057	1.706	0.19	< 0.05 U1	0.0186	0.013	0.7 J1	0.07 J1	< 0.1 U1
10/19/2020	Assessment	0.08 J1	3.45	48.4	< 0.02 U1	0.05	0.1 J1	0.445	3.281	0.21	0.426	0.0180	0.004 J1	0.6 J1	< 0.03 U1	< 0.1 U1
3/1/2021	Assessment	0.05 J1	3.28	48.7	< 0.02 U1	0.02 J1	< 0.04 U1	< 0.02 U1	2.15	0.25	< 0.05 U1	0.0188	< 0.002 U1	0.5 J1	< 0.03 U1	< 0.1 U1
6/21/2021	Assessment	0.03 J1	4.95	49.0	0.010 J1	0.015 J1	0.37	1.34	2.67	0.25	0.14 J1	0.0178 P3	0.003 J1	0.5	< 0.09 U1	< 0.04 U1
9/21/2021	Assessment	0.04 J1	5.28	51.0	0.009 P2, J1	0.018 J1	0.23	0.951	2.26	0.20	0.23	0.0152 P2	< 0.002 U1	0.3 J1	< 0.09 U1	< 0.04 U1
3/14/2022	Assessment	0.03 J1	4.80	50.8	< 0.007 U1	0.152	0.20	0.01 J1	4.77	0.20	< 0.05 U1	0.0174	< 0.002 U1	0.3 J1	< 0.09 U1	< 0.04 U1
6/13/2022	Assessment	0.03 J1	5.56	50.0	0.009 J1	0.011 J1	0.41	1.46	2.85	0.21	0.15 J1	0.0169	0.002 J1	0.2 J1	< 0.09 U1	< 0.04 U1
9/20/2022	Assessment	0.02 J1	5.21	62.4	0.016 J1	0.014 J1	0.40	0.863 B1	2.60	0.19	0.24	0.0174	0.004 J1	0.2 J1	< 0.09 U1	< 0.04 U1
3/6/2023	Assessment	< 0.02 U1	9.74	48.6	0.038 J1	0.017 J1	0.31	0.944	3.57	0.17	0.17 J1	0.0178	0.003 J1	0.3 J1	< 0.09 U1	< 0.04 U1
6/19/2023	Assessment	0.021 J1	9.44	51.6	0.012 J1	0.005 J1	0.38	0.704	2.72	0.18	0.07 J1	0.0171	0.002 J1	0.2 J1	< 0.04 U1	< 0.02 U1
9/19/2023	Assessment	0.027 J1	9.83	29.2	0.011 J1	0.007 J1	0.36	0.245	1.74	0.17	0.07 J1	0.0179	0.004 J1	0.1 J1	< 0.04 U1	< 0.02 U1



**Table 1. Groundwater Data Summary: B-9  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.01	81	5	< 0.083 U1	7.2	14	234
7/19/2016	Background	0.00947041 J1	83	5	0.3556 J1	7.4	14	204
9/14/2016	Background	0.00711941 J1	99.6	7	< 0.083 U1	7.6	18	239
10/4/2016	Background	0.00768136 J1	98.6	8	0.1884 J1	7.4	21	246
11/7/2016	Background	0.01	94.3	6	< 0.083 U1	7.9	25	240
1/23/2017	Background	0.02	99.8	5	< 0.083 U1	6.6	19	234
3/7/2017	Background	0.01	88.5	6	< 0.083 U1	6.4	21	228
4/26/2017	Background	0.01036	87.7	6	0.31 J1	6.8	19	224
5/16/2017	Background	0.009500 J1	98.5	6	< 0.083 U1	7.5	21	198
6/12/2017	Background	0.02369	124	6	< 0.083 U1	7.0	22	270
8/28/2017	Detection	0.02463	106	6	0.2389 J1	7.2	25	224
3/28/2018	Assessment	0.00998 J1	86.1	6	< 0.083 U1	7.9	28	260
8/27/2018	Assessment	0.010	144	--	--	7.7	--	272
10/23/2018	Assessment	--	--	7.22	< 0.083 U1	--	36.7	--
3/12/2019	Assessment	0.01 J1	97.3	3.68	0.1 J1	8.1	34.3	278
6/11/2019	Assessment	< 0.04 U1	99.7	3.69	0.13	7.7	37.6	248
8/27/2019	Assessment	< 0.02 U1	128	3	< 0.083 U1	7.2	37	310
3/24/2020	Assessment	--	--	3.70	0.09	6.9	29.8	264
6/24/2020	Assessment	< 0.02 U1	91.0	4.04	0.07	7.6	30.7	274
10/20/2020	Assessment	< 0.02 U1	88.7	5.39	0.07	6.9	26.2	279
3/2/2021	Assessment	--	--	--	0.09	7.0	--	--
6/21/2021	Assessment	0.01 J1	80.9	4.23	0.09	6.7	28.6	270
9/21/2021	Assessment	< 0.009 U1	86.4	5.20	0.07	6.6	25.7	260
3/15/2022	Assessment	--	--	--	0.07	7.5	--	--
6/13/2022	Assessment	< 0.009 U1	78.6	4.04	0.09	7.2	36.0	290
9/21/2022	Assessment	0.012 J1	83.7	5.37	0.07	6.7	34.2	290
3/7/2023	Assessment	--	--	--	0.07	6.7	--	--
6/20/2023	Assessment	0.013 J1	80.0	5.71	0.06	7.0	42.7	300
9/19/2023	Assessment	0.012 J1	91.2	6.85	0.07	7.0	38.5	280

Table 1. Groundwater Data Summary: B-9

Flint Creek - LF

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	128	0.0475927 J1	< 0.07 U1	2	0.648715 J1	0.25	< 0.083 U1	< 0.68 U1	0.005	0.01472 J1	0.871853 J1	< 0.99 U1	1.51586 J1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	139	0.0706417 J1	< 0.07 U1	2	0.520418 J1	--	0.3556 J1	0.756023 J1	0.003	0.01407 J1	< 0.29 U1	< 0.99 U1	1.04447 J1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	143	< 0.02 U1	< 0.07 U1	3	1.03431 J1	3.039	< 0.083 U1	< 0.68 U1	0.002	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/4/2016	Background	< 0.93 U1	< 1.05 U1	135	< 0.02 U1	< 0.07 U1	4	1.7825 J1	0.893	0.1884 J1	0.693028 J1	0.016	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/7/2016	Background	< 0.93 U1	< 1.05 U1	136	0.0202009 J1	< 0.07 U1	3	1.48231 J1	0.569	< 0.083 U1	< 0.68 U1	0.003	0.00774 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/23/2017	Background	< 0.93 U1	< 1.05 U1	154	0.03324 J1	< 0.07 U1	3	1.21896 J1	0.618	< 0.083 U1	< 0.68 U1	0.003	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	1.39106 J1	< 1.05 U1	142	< 0.02 U1	< 0.07 U1	2	0.886686 J1	2.009	< 0.083 U1	< 0.68 U1	0.009	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/26/2017	Background	< 0.93 U1	1.13 J1	144	< 0.02 U1	< 0.07 U1	2.52	0.93 J1	0.989	0.31 J1	0.79 J1	0.00316	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/16/2017	Background	< 0.93 U1	1.68 J1	142	0.03 J1	< 0.07 U1	2.56	0.83 J1	9.472	< 0.083 U1	< 0.68 U1	0.00311	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/12/2017	Background	< 0.93 U1	1.11 J1	150	0.04 J1	< 0.07 U1	4.01	1.32 J1	1.795	< 0.083 U1	< 0.68 U1	0.00343	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/28/2018	Assessment	< 0.93 U1	< 1.05 U1	177	< 0.02 U1	< 0.07 U1	0.91 J1	0.36 J1	2.06	< 0.083 U1	< 0.68 U1	0.0041	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/27/2018	Assessment	0.11	1.29	139	0.034	0.06	1.74	2.33	1.12	--	1.08	0.00241	< 0.005 U1	0.54	0.8	0.04 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.85	175	< 0.1 U1	< 0.05 U1	0.6 J1	0.2 J1	0.629	0.1 J1	0.2 J1	0.00528	< 0.005 U1	< 2 U1	< 0.2 U1	< 0.5 U1
6/11/2019	Assessment	< 0.1 U1	0.90	166	< 0.1 U1	< 0.05 U1	1.11	0.2 J1	0.1572	0.13	< 0.2 U1	< 0.02 U1	< 0.005 U1	36.1	0.4 J1	< 0.5 U1
8/27/2019	Assessment	0.09 J1	1.67	188	0.02 J1	0.08	1.61	0.827	1.258	< 0.083 U1	0.509	0.00409	< 0.005 U1	0.4 J1	0.5	< 0.1 U1
3/24/2020	Assessment	0.03 J1	0.77	151	< 0.02 U1	0.01 J1	0.932	0.411	1.696	0.09	0.08 J1	0.00356	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
6/24/2020	Assessment	0.05 J1	1.04	147	< 0.02 U1	0.01 J1	1.35	0.362	0.843	0.07	0.242	0.00264	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
10/20/2020	Assessment	0.03 J1	0.56	154	< 0.02 U1	< 0.01 U1	0.436	0.133	1.204	0.07	0.06 J1	0.00257	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
3/2/2021	Assessment	0.02 J1	0.50	157	< 0.02 U1	< 0.01 U1	0.539	0.074	0.703	0.09	< 0.05 U1	0.00280	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
6/21/2021	Assessment	0.02 J1	0.46	148	< 0.007 U1	0.009 J1	0.71	0.123	1.24	0.09	< 0.05 U1	0.00272	< 0.002 U1	0.3 J1	0.34 J1	< 0.04 U1
9/21/2021	Assessment	0.03 J1	0.52	158 M1, P3	< 0.007 P2, U1	< 0.004 U1	0.66	0.100	0.96	0.07	< 0.05 U1	0.00264 P2	< 0.002 U1	0.3 J1	0.36 J1	< 0.04 U1
3/15/2022	Assessment	0.02 J1	0.47	166	< 0.007 U1	0.011 J1	0.77	0.122	2.96	0.07	< 0.05 U1	0.00315	< 0.002 U1	0.2 J1	0.38 J1	< 0.04 U1
6/13/2022	Assessment	0.04 J1	0.65	154	0.008 J1	0.025	1.02	0.580	0.99	0.09	0.22	0.00354	< 0.002 U1	3.8	0.40 J1	< 0.04 U1
9/21/2022	Assessment	0.03 J1	0.53	164	< 0.007 U1	0.008 J1	0.90	0.161 B1	0.50	0.07	0.08 J1	0.00279	< 0.002 U1	0.3 J1	0.39 J1	< 0.04 U1
3/7/2023	Assessment	0.03 J1	0.44	158	0.026 J1	0.009 J1	1.02	0.133	1.18	0.07	0.13 J1	0.00386	< 0.002 U1	0.2 J1	0.40 J1	< 0.04 U1
6/20/2023	Assessment	0.026 J1	0.43	154	0.020 J1	0.008 J1	0.95	0.086	0.77	0.06	0.11 J1	0.00285	< 0.002 U1	0.3 J1	0.49 J1	0.02 J1
9/19/2023	Assessment	0.035 J1	0.49	169	< 0.007 U1	0.009 J1	0.87	0.407	0.79	0.07	0.12 J1	0.00299	< 0.002 U1	0.3 J1	0.48 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: B-10  
Flint Creek - LF  
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.02	77.6	7	< 0.083 U1	8.4	30	275
7/19/2016	Background	0.01	82.5	8	< 0.083 U1	7.4	30	252
9/14/2016	Background	0.02	104	8	< 0.083 U1	7.3	31	275
10/4/2016	Background	0.02	82.9	9	0.2319 J1	7.0	39	308
11/7/2016	Background	0.03	116	8	< 0.083 U1	8.0	30	268
1/23/2017	Background	0.03	77.1	7	< 0.083 U1	7.1	33	276
3/7/2017	Background	0.02	84.8	6	< 0.083 U1	6.6	29	268
4/25/2017	Background	0.01728	77.4	8	0.3 J1	6.6	26	266
5/15/2017	Background	0.03169	80.6	8	< 0.083 U1	6.8	35	284
6/12/2017	Background	0.04007	75.6	9	< 0.083 U1	6.5	31	296
8/28/2017	Detection	0.0448	72.8	9	0.3304 J1	7.4	28	256
3/26/2018	Assessment	0.00862 J1	76.6	6	< 0.083 U1	8.0	25	244
8/27/2018	Assessment	0.028	64.4	--	--	7.6	--	254
10/23/2018	Assessment	--	--	11.7	< 0.083 U1	--	26.4	--
3/12/2019	Assessment	0.028	72.4	9.68	0.1 J1	8.4	21.4	226
6/10/2019	Assessment	< 0.04 U1	80.4	9.24	0.11	7.4	26.1	260
8/27/2019	Assessment	< 0.02 U1	70.8	7	< 0.083 U1	7.3	26	268
3/24/2020	Assessment	--	--	9.41	0.10	7.2	26.1	252
6/23/2020	Assessment	--	--	--	--	7.8	--	--
6/24/2020	Assessment	< 0.02 U1	76.5	10.1	0.08	--	27.8	234
10/20/2020	Assessment	< 0.02 U1	86.0	10.3	0.08	6.6	26.8	257
3/2/2021	Assessment	--	--	--	0.09	7.1	--	--
6/22/2021	Assessment	< 0.009 U1	78.1	10.7	0.09	6.9	27.0	260
9/20/2021	Assessment	--	--	--	--	6.6	--	--
9/21/2021	Assessment	< 0.009 U1	80.5	10.4	0.1	--	28.9	250
3/14/2022	Assessment	--	--	--	--	6.7	--	--
3/15/2022	Assessment	--	--	--	0.07	--	--	--
6/13/2022	Assessment	--	--	--	--	6.7	--	--
6/14/2022	Assessment	< 0.009 U1	71.6	10.9	0.09	--	28.6	270
9/20/2022	Assessment	--	--	--	--	6.8	--	--
9/21/2022	Assessment	0.013 J1	75.1	11.4	0.11	--	28.5	270
3/6/2023	Assessment	--	--	--	--	6.7	--	--
3/7/2023	Assessment	--	--	--	0.07	--	--	--
6/19/2023	Assessment	--	--	--	--	6.7	--	--
6/20/2023	Assessment	0.016 J1	72.8	11.4	0.19	--	27.7	280
9/18/2023	Assessment	--	--	--	--	6.9	--	--
9/19/2023	Assessment	0.014 J1	81.2	11.3	0.15	--	33.7	290

Table 1. Groundwater Data Summary: B-10

Flint Creek - LF

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	77	0.0283721 J1	< 0.07 U1	2	0.567956 J1	0.3279	< 0.083 U1	< 0.68 U1	0.004	0.01767 J1	1.07659 J1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	78	0.0513816 J1	< 0.07 U1	2	0.487304 J1	--	< 0.083 U1	< 0.68 U1	0.002	0.02255 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	1.73638 J1	102	< 0.02 U1	< 0.07 U1	16	1.45899 J1	0.625	< 0.083 U1	1.5658 J1	0.003	< 0.005 U1	0.405665 J1	< 0.99 U1	< 0.86 U1
10/4/2016	Background	< 0.93 U1	< 1.05 U1	76	< 0.02 U1	< 0.07 U1	1	0.616894 J1	1.305	0.2319 J1	< 0.68 U1	0.016	< 0.005 U1	0.98229 J1	< 0.99 U1	< 0.86 U1
11/7/2016	Background	< 0.93 U1	6	103	0.350438 J1	0.413058 J1	37	5	1.066	< 0.083 U1	2.57815 J1	0.005	0.01543 J1	1.18188 J1	< 0.99 U1	< 0.86 U1
1/23/2017	Background	< 0.93 U1	< 1.05 U1	82	0.049146 J1	< 0.07 U1	1	1.02071 J1	0.618	< 0.083 U1	< 0.68 U1	0.003	< 0.005 U1	1.261 J1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	< 0.93 U1	< 1.05 U1	77	< 0.02 U1	< 0.07 U1	2	0.814652 J1	1.119	< 0.083 U1	< 0.68 U1	0.01	< 0.005 U1	1.02218 J1	< 0.99 U1	< 0.86 U1
4/25/2017	Background	< 0.93 U1	1.5 J1	69.33	< 0.02 U1	< 0.07 U1	0.26 J1	0.65 J1	0.668	0.3 J1	< 0.68 U1	0.00287	< 0.005 U1	0.92 J1	< 0.99 U1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	< 1.05 U1	82.92	< 0.02 U1	< 0.07 U1	0.59 J1	0.76 J1	1.294	< 0.083 U1	< 0.68 U1	0.00357	< 0.005 U1	1.55 J1	< 0.99 U1	< 0.86 U1
6/12/2017	Background	< 0.93 U1	< 1.05 U1	76.25	< 0.02 U1	< 0.07 U1	0.39 J1	1.17 J1	2.477	< 0.083 U1	< 0.68 U1	0.00358	< 0.005 U1	1.28 J1	< 0.99 U1	< 0.86 U1
3/26/2018	Assessment	< 0.93 U1	< 1.05 U1	81.96	< 0.02 U1	< 0.07 U1	1.37	0.44 J1	1.869	< 0.083 U1	1.12 J1	0.00156	< 0.005 U1	0.78 J1	< 0.99 U1	1.36 J1
8/27/2018	Assessment	0.10	2.80	74.8	0.02 J1	0.03	0.889	1.60	0.887	--	0.189	0.00308	0.005 J1	3.52	0.3	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	0.1 J1	0.67	79.1	< 0.1 U1	0.05 J1	0.9 J1	0.299	0.86	0.1 J1	0.3 J1	0.00167	< 0.005 U1	< 2 U1	0.3 J1	< 0.5 U1
6/10/2019	Assessment	0.2 J1	0.3 J1	78.3	< 0.1 U1	< 0.05 U1	0.3 J1	< 0.1 U1	1.128	0.11	< 0.2 U1	< 0.02 U1	< 0.005 U1	10 J1	0.5 J1	< 0.5 U1
8/27/2019	Assessment	0.11	0.46	79.1	< 0.02 U1	0.02 J1	0.385	0.128	1.344	< 0.083 U1	0.05 J1	0.00169	0.016 J1	1 J1	0.4	< 0.1 U1
3/24/2020	Assessment	0.05 J1	0.37	83.5	< 0.02 U1	0.02 J1	0.429	0.03 J1	1.05	0.10	< 0.05 U1	0.00133	< 0.002 U1	0.6 J1	0.4	< 0.1 U1
6/24/2020	Assessment	0.10	0.38	78.8	< 0.02 U1	0.02 J1	0.781	0.102	1.355	0.08	0.08 J1	0.00144	< 0.002 U1	0.8 J1	0.5	< 0.1 U1
10/20/2020	Assessment	0.18	0.80	82.2	0.04 J1	0.04 J1	2.07	1.18	1.748	0.08	0.641	0.00140	0.002 J1	0.7 J1	0.6	< 0.1 U1
3/2/2021	Assessment	0.08 J1	0.36	81.7	< 0.02 U1	0.03 J1	0.649	0.095	0.953	0.09	0.09 J1	0.00127	< 0.002 U1	0.5 J1	0.4	< 0.1 U1
6/22/2021	Assessment	0.11	0.31	82.3	< 0.007 U1	0.030	0.76	0.086	1.09	0.09	0.14 J1	0.00124	< 0.002 U1	0.5	0.44 J1	< 0.04 U1
9/21/2021	Assessment	0.18	0.57	79.8	0.021 P2, J1	0.024	2.30	0.654	1.68	0.1	0.32	0.00132 P2	< 0.002 U1	0.5	0.55	< 0.04 U1
3/15/2022	Assessment	0.16	0.45	87.1	< 0.007 U1	0.026	0.63	0.156	2.12	0.07	0.07 J1	0.00137	< 0.002 U1	1	0.44 J1	< 0.04 U1
6/14/2022	Assessment	0.17	0.26	83.1	< 0.007 U1	0.020	0.59	0.041	1.34	0.09	< 0.05 U1	0.00132	< 0.002 U1	0.9	0.41 J1	< 0.04 U1
9/21/2022	Assessment	0.18	0.92	90.1	0.039 J1	0.046	4.53	1.11 B1	2.24	0.11	0.60	0.00190	< 0.002 U1	1.8	0.54	< 0.04 U1
3/7/2023	Assessment	0.09 J1	0.30	86.2	0.018 J1	0.027	0.70	0.077	1.21	0.07	0.12 J1	0.00149	< 0.002 U1	0.7	0.41 J1	< 0.04 U1
6/20/2023	Assessment	0.108	6.81	85.1	0.047 J1	0.024	1.71	0.381	0.78	0.19	0.27	0.00219	< 0.002 U1	2.0	0.27 J1	0.02 J1
9/19/2023	Assessment	0.259	0.83	85.1	0.049 J1	0.052	3.44	1.51	0.68	0.15	0.73	0.00225	0.003 J1	1.8	0.61	0.04 J1

**Table 1. Groundwater Data Summary: B-11  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.171	10.5	4	< 0.083 U1	5.7	26	182
7/19/2016	Background	0.238	13.3	5	< 0.083 U1	6.2	41	144
9/14/2016	Background	0.207	14.7	6	< 0.083 U1	6.6	33	120
10/4/2016	Background	0.19	13	6	< 0.083 U1	6.4	36	156
11/7/2016	Background	0.188	11.3	5	< 0.083 U1	6.5	36	106
1/23/2017	Background	0.214	18.2	4	< 0.083 U1	6.1	39	128
3/7/2017	Background	0.199	12.6	3	< 0.083 U1	5.5	37	112
4/26/2017	Background	0.253	16.2	6	< 0.083 U1	5.9	45	130
5/16/2017	Background	0.453	13.6	6	< 0.083 U1	5.3	62	142
6/13/2017	Background	0.508	14.9	6	< 0.083 U1	5.4	60	184
8/28/2017	Detection	0.266	9.65	6	< 0.083 U1	5.3	43	108
12/21/2017	Detection	0.227	--	--	--	6.7	--	--
3/28/2018	Assessment	0.465	12.2	4	< 0.083 U1	5.4	53	136
8/27/2018	Assessment	0.281	10.8	--	--	5.9	--	100
10/23/2018	Assessment	--	--	6.93	< 0.083 U1	--	47.7	--
3/12/2019	Assessment	0.409	11.6	4.03	0.04 J1	5.8	44.9	104
6/10/2019	Assessment	0.548	17.0	3.73	0.04 J1	5.9	54.7	82
8/27/2019	Assessment	0.605	15.4	3	< 0.083 U1	5.8	59	138
3/24/2020	Assessment	--	--	3.27	0.04 J1	6.4	47.6	144
6/23/2020	Assessment	0.255	12.3	4.33	0.02 J1	6.0	32.7	104
10/20/2020	Assessment	0.327	14.1	3.39	0.03 J1	5.3	37.4	143
3/2/2021	Assessment	--	--	--	0.03 J1	5.3	--	--
6/21/2021	Assessment	0.277	11.4	7.00	0.03 J1	5.9	35.1	130
9/21/2021	Assessment	0.375	12.2	6.82	0.03 J1	5.1	41.6	120
3/15/2022	Assessment	--	--	--	< 0.02 U1	6.3	--	--
6/13/2022	Assessment	0.437	23.1	12.2	0.05 J1	6.8	47.8	200
9/21/2022	Assessment	0.337	11.9	8.38	< 0.02 U1	6.4	42.3	130
3/7/2023	Assessment	--	--	--	0.04 J1	6.3	--	--
9/19/2023	Assessment	0.364	22.4	19.5	0.04 J1	6.3	42.7	170

**Table 1. Groundwater Data Summary: B-11  
Flint Creek - LF  
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	139	0.899874 J1	1	13	3.28467 J1	1.311	< 0.083 U1	4.23401 J1	0.006	0.02458 J1	0.362121 J1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	7	187	2	2	22	6	--	< 0.083 U1	9	0.018	0.02442 J1	0.590003 J1	1.89587 J1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	32	494	6	4	108	25	8.05	< 0.083 U1	49	0.079	0.097	3.32649 J1	< 0.99 U1	1.00112 J1
10/4/2016	Background	< 0.93 U1	3.13751 J1	163	1	1	16	4.44532 J1	2.161	< 0.083 U1	6	0.02	< 0.005 U1	0.370625 J1	1.95476 J1	< 0.86 U1
11/7/2016	Background	< 0.93 U1	< 1.05 U1	99	0.259911 J1	0.649573 J1	2	0.824023 J1	0.874	< 0.083 U1	< 0.68 U1	0.004	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/23/2017	Background	< 0.93 U1	< 1.05 U1	121	0.136215 J1	0.418062 J1	2	0.286943 J1	1	< 0.083 U1	< 0.68 U1	0.003	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	< 0.93 U1	< 1.05 U1	97	0.249082 J1	0.477646 J1	2	0.554259 J1	12.993	< 0.083 U1	< 0.68 U1	0.003	< 0.005 U1	< 0.29 U1	2.72028 J1	< 0.86 U1
4/26/2017	Background	< 0.93 U1	< 1.05 U1	138	0.38 J1	0.56 J1	5.16	1.24 J1	0.512	< 0.083 U1	0.83 J1	0.00566	< 0.005 U1	< 0.29 U1	1.52 J1	< 0.86 U1
5/16/2017	Background	< 0.93 U1	1.16 J1	129	0.39 J1	0.15 J1	3.27	0.97 J1	0.911	< 0.083 U1	< 0.68 U1	0.00329	< 0.005 U1	< 0.29 U1	2.68 J1	< 0.86 U1
6/13/2017	Background	< 0.93 U1	< 1.05 U1	127	0.41 J1	0.13 J1	3.67	1.08 J1	2.655	< 0.083 U1	1.23 J1	0.00334	< 0.005 U1	< 0.29 U1	1.15 J1	< 0.86 U1
3/28/2018	Assessment	4.89 J1	< 1.05 U1	124	0.34 J1	0.16 J1	0.99 J1	0.48 J1	1.183	< 0.083 U1	1 J1	0.00181	< 0.005 U1	< 0.29 U1	4.37 J1	< 0.86 U1
8/27/2018	Assessment	0.01 J1	0.25	94.9	0.365	0.15	1.36	0.159	1.551	--	0.097	0.00255	< 0.005 U1	0.08 J1	2.4	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.90	119	0.622	0.1 J1	1.95	0.372	0.451	0.04 J1	0.935	0.00221	< 0.005 U1	< 2 U1	3.5	< 0.5 U1
6/10/2019	Assessment	< 0.04 U1	0.36	111	0.316	0.08 J1	0.884	0.162	1.121	0.04 J1	0.2 J1	0.03 J1	< 0.005 U1	< 0.8 U1	3.1	< 0.2 U1
8/27/2019	Assessment	< 0.02 U1	0.55	131	0.317	0.10	1.36	0.256	0.455	< 0.083 U1	0.416	0.00130	< 0.005 U1	< 0.4 U1	4.1	< 0.1 U1
3/24/2020	Assessment	< 0.02 U1	0.20	101	0.162	0.07	0.542	0.094	1.437	0.04 J1	< 0.05 U1	0.000878	< 0.002 U1	< 0.4 U1	3.0	< 0.1 U1
6/23/2020	Assessment	< 0.02 U1	0.13	91.1	0.275	0.07	0.763	0.084	0.835	0.02 J1	< 0.05 U1	0.00128	< 0.002 U1	< 0.4 U1	2.0	< 0.1 U1
10/20/2020	Assessment	< 0.02 U1	0.14	84.9	0.219	0.05	0.919	0.085	2.095	0.03 J1	< 0.05 U1	0.00151	< 0.002 U1	< 0.4 U1	2.3	< 0.1 U1
3/2/2021	Assessment	< 0.02 U1	0.14	103	0.333	0.09	1.08	0.121	0.968	0.03 J1	< 0.05 U1	0.00192	< 0.002 U1	< 0.4 U1	2.1	< 0.1 U1
6/21/2021	Assessment	< 0.02 U1	0.13	101	0.301	0.102	0.99	0.098	0.72	0.03 J1	0.05 J1	0.00112	< 0.002 U1	< 0.1 U1	2.00	< 0.04 U1
9/21/2021	Assessment	< 0.02 U1	0.13	90.5	0.270 P2	0.058	0.92	0.098	1.22	0.03 J1	< 0.05 U1	0.00168 P2	< 0.002 U1	< 0.1 U1	2.38	< 0.04 U1
3/15/2022	Assessment	< 0.02 U1	0.21	113	0.490	0.188	1.27	0.184	1.67	< 0.02 U1	0.07 J1	0.00297	< 0.002 U1	< 0.1 U1	2.48	< 0.04 U1
6/13/2022	Assessment	< 0.02 U1	0.25	99.4	0.075	0.029	0.66	0.096	0.76	0.05 J1	< 0.05 U1	0.00060	< 0.002 U1	1.8	3.33	< 0.04 U1
9/21/2022	Assessment	< 0.02 U1	0.17	96.0	0.287	0.076	1.15	0.115 B1	1.09	< 0.02 U1	< 0.05 U1	0.00161	< 0.002 U1	< 0.1 U1	2.37	< 0.04 U1
3/7/2023	Assessment	< 0.02 U1	0.17	135	0.110	0.042	0.67	0.094	0.95	0.04 J1	0.08 J1	0.00068	< 0.002 U1	< 0.1 U1	2.33	< 0.04 U1
9/19/2023	Assessment	0.019 J1	0.24	107	0.166	0.062	1.34	0.125	0.99	0.04 J1	0.16 J1	0.00141	< 0.002 U1	< 0.1 U1	2.35	0.02 J1

**Table 1. Groundwater Data Summary: B-12  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/24/2016	Background	0.02	63	10	< 0.083 U1	8.2	19	280
7/19/2016	Background	0.02	61.1	10	< 0.083 U1	7.6	15	216
9/14/2016	Background	0.02	70.5	11	< 0.083 U1	7.1	14	236
10/5/2016	Background	0.02	69.2	12	0.1908 J1	7.0	12	271
11/8/2016	Background	0.03	66.7	12	< 0.083 U1	6.9	14	308
1/24/2017	Background	0.02	67.1	9	< 0.083 U1	6.7	9	268
3/7/2017	Background	0.02	68.1	9	< 0.083 U1	6.3	11	248
4/25/2017	Background	0.02379	59.4	9	< 0.083 U1	6.4	10	282
5/15/2017	Background	0.023	61.5	10	< 0.083 U1	6.4	10	236
6/13/2017	Background	0.0347	59.4	10	< 0.083 U1	6.6	9	252
8/29/2017	Detection	0.03061	72	10	< 0.083 U1	7.2	12	248
3/26/2018	Assessment	0.02876	56.2	7	< 0.083 U1	7.8	6	176
8/28/2018	Assessment	0.016	56.4	--	--	7.9	--	258
10/23/2018	Assessment	--	--	13.2	< 0.083 U1	--	9.16	--
3/11/2019	Assessment	0.02 J1	58.0	11.0	0.06 J1	8.5	5.0	254
6/10/2019	Assessment	0.04 J1	60.9	10.6	0.06 J1	7.2	7.0	244
8/27/2019	Assessment	< 0.02 U1	59.6	8	< 0.083 U1	6.9	9	252
3/23/2020	Assessment	--	--	8.53	0.03 J1	6.7	6.1	210
6/23/2020	Assessment	< 0.02 U1	57.0	11.2	0.03 J1	7.3	6.2	238
10/19/2020	Assessment	< 0.02 U1	70.3	11.0	0.05 J1	6.6	9.5	266
3/1/2021	Assessment	--	--	--	0.05 J1	7.0	--	--
6/21/2021	Assessment	0.014 J1	53.0	9.33	0.04 J1	6.5	4.91	220
9/20/2021	Assessment	0.012 J1	58.2	8.75	0.05 J1	6.4	9.05	220
3/14/2022	Assessment	--	--	--	0.03 J1	6.5	--	--
6/13/2022	Assessment	0.009 J1	48.3	8.90	0.03 J1	6.5	6.20	220 P1
9/20/2022	Assessment	0.014 J1	49.3	6.97	0.04 J1	6.5	7.52	180
3/6/2023	Assessment	--	--	--	0.02 J1	6.5	--	--
6/19/2023	Assessment	0.013 J1	54.5	8.25	0.05 J1	6.6	15.7	240
9/18/2023	Assessment	0.017 J1	57.9	7.06	0.04 J1	6.4	10.5	230

**Table 1. Groundwater Data Summary: B-12  
Flint Creek - LF  
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/24/2016	Background	< 0.93 U1	< 1.05 U1	62	0.020013 J1	< 0.07 U1	0.98147 J1	3.36185 J1	0.28188	< 0.083 U1	0.779741 J1	0.000759267 J1	0.01713 J1	2.94917 J1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	61	0.0839166 J1	< 0.07 U1	2	2.84565 J1	--	< 0.083 U1	1.17408 J1	0.001	0.0216 J1	3.86821 J1	< 0.99 U1	< 0.86 U1
9/14/2016	Background	< 0.93 U1	< 1.05 U1	70	< 0.02 U1	< 0.07 U1	2	2.53407 J1	1.953	< 0.083 U1	0.716221 J1	0.000874536 J1	< 0.005 U1	3.27157 J1	< 0.99 U1	< 0.86 U1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	67	< 0.02 U1	< 0.07 U1	0.86698 J1	2.31495 J1	1.666	0.1908 J1	< 0.68 U1	0.014	< 0.005 U1	2.00891 J1	< 0.99 U1	< 0.86 U1
11/8/2016	Background	< 0.93 U1	8	123	1	0.465087 J1	22	23	1.743	< 0.083 U1	15	0.011	0.039	4.65502 J1	< 0.99 U1	< 0.86 U1
1/24/2017	Background	< 0.93 U1	< 1.05 U1	63	< 0.02 U1	< 0.07 U1	0.446889 J1	1.76121 J1	1.357	< 0.083 U1	< 0.68 U1	0.000559654 J1	< 0.005 U1	1.1441 J1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	< 0.93 U1	< 1.05 U1	59	< 0.02 U1	< 0.07 U1	1	1.61975 J1	2.97	< 0.083 U1	0.903447 J1	0.006	< 0.005 U1	2.06812 J1	< 0.99 U1	< 0.86 U1
4/25/2017	Background	1.92 J1	1.23 J1	53.73	0.02 J1	< 0.07 U1	0.65 J1	1.34 J1	0.908	< 0.083 U1	< 0.68 U1	0.00106	0.006 J1	0.69 J1	< 0.99 U1	< 0.86 U1
5/15/2017	Background	< 0.93 U1	1.65 J1	59.7	0.07 J1	< 0.07 U1	1.57	1.95 J1	0.6398	< 0.083 U1	0.77 J1	0.00132	< 0.005 U1	0.58 J1	< 0.99 U1	< 0.86 U1
6/13/2017	Background	< 0.93 U1	< 1.05 U1	56.66	< 0.02 U1	< 0.07 U1	0.63 J1	1.3 J1	2.635	< 0.083 U1	< 0.68 U1	0.00085 J1	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/26/2018	Assessment	1.15 J1	< 1.05 U1	50.7	< 0.02 U1	< 0.07 U1	1.06	1.85 J1	0.867	< 0.083 U1	< 0.68 U1	0.00069 J1	< 0.005 U1	1.13 J1	< 0.99 U1	0.96 J1
8/28/2018	Assessment	0.15	0.43	48.8	0.042	0.03	0.993	2.51	0.891	--	0.535	0.000702	< 0.005 U1	1.11	0.4	0.03 J1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/11/2019	Assessment	< 0.1 U1	0.3 J1	51.6	< 0.1 U1	< 0.05 U1	1.09	3.35	0.777	0.06 J1	0.5 J1	0.0008 J1	< 0.005 U1	< 2 U1	0.3 J1	< 0.5 U1
6/10/2019	Assessment	0.1 J1	0.29	54.2	< 0.04 U1	0.03 J1	0.585	2.49	0.5134	0.06 J1	0.3	< 0.02 U1	< 0.005 U1	< 0.8 U1	0.2 J1	< 0.2 U1
8/27/2019	Assessment	0.24	1.20	60.8	0.150	0.08	2.04	11.2	1.111	< 0.083 U1	2.65	0.00176	0.006 J1	0.4 J1	1.4	< 0.1 U1
3/23/2020	Assessment	0.05 J1	0.14	52.6	< 0.02 U1	0.02 J1	0.321	2.62	1.722	0.03 J1	0.07 J1	0.000768	< 0.002 U1	0.6 J1	0.1 J1	< 0.1 U1
6/23/2020	Assessment	0.07 J1	0.11	59.7	< 0.02 U1	0.02 J1	0.481	1.82	0.421	0.03 J1	< 0.05 U1	0.000828	< 0.002 U1	0.5 J1	0.1 J1	< 0.1 U1
10/19/2020	Assessment	0.16	0.14	62.9	< 0.02 U1	0.03 J1	0.601	2.26	1.611	0.05 J1	0.1 J1	0.00114	< 0.002 U1	0.7 J1	0.2	< 0.1 U1
3/1/2021	Assessment	0.07 J1	0.12	44.7	< 0.02 U1	0.02 J1	0.501	2.52	0.4501	0.05 J1	0.05 J1	0.000751	< 0.002 U1	0.5 J1	0.09 J1	< 0.1 U1
6/21/2021	Assessment	0.06 J1	0.1	54.6	0.009 J1	0.018 J1	0.68	2.81	4.62	0.04 J1	0.06 J1	0.00086	< 0.002 U1	0.4 J1	0.12 J1	< 0.04 U1
9/20/2021	Assessment	0.16	0.13	52.4	< 0.007 P2, U1	0.008 J1	0.75	2.39	0.74	0.05 J1	0.08 J1	0.00115 P2	< 0.002 U1	0.7	0.17 J1	< 0.04 U1
3/14/2022	Assessment	0.05 J1	0.11	54.2	< 0.007 U1	0.023	0.96	3.50	2.35	0.03 J1	< 0.05 U1	0.00103	< 0.002 U1	0.3 J1	0.20 J1	< 0.04 U1
6/13/2022	Assessment	0.08 J1	0.09 J1	50.5	< 0.007 U1	0.016 J1	0.64	2.83	1.04	0.03 J1	0.08 J1	0.00092	< 0.200 U1	0.4 J1	0.13 J1	< 0.04 U1
9/20/2022	Assessment	0.14	0.13	45.8	0.008 J1	0.021	0.87	2.75 B1	0.74	0.04 J1	0.09 J1	0.00105	< 0.200 U1	0.6	0.10 J1	< 0.04 U1
3/6/2023	Assessment	0.03 J1	0.12	58.0	0.031 J1	0.023	0.59	3.03	0.71	0.02 J1	0.07 J1	0.00108	< 0.002 U1	0.2 J1	0.16 J1	< 0.04 U1
6/19/2023	Assessment	0.179	0.17	50.9	0.034 J1	0.022	1.17	0.666	2.00	0.05 J1	0.23	0.00119	< 0.002 U1	0.7	0.14 J1	0.02 J1
9/18/2023	Assessment	0.126	0.1	54.9	0.009 J1	0.024	0.92	2.54	0.96	0.04 J1	0.08 J1	0.00146	< 0.002 U1	0.4 J1	0.22 J1	0.02 J1



**Table 1. Groundwater Data Summary: B-13  
Flint Creek - LF  
Appendix III Constituents**

*Geosyntec Consultants, Inc.*

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/23/2016	Background	0.02	15.1	4	< 0.083 U1	6.9	20	108
7/19/2016	Background	0.03	14.7	3	< 0.083 U1	5.9	23	88
9/13/2016	Background	0.02	13	4	< 0.083 U1	5.1	18	68
10/5/2016	Background	0.02	13.6	5	< 0.083 U1	5.2	20	80
11/8/2016	Background	0.01	4.07	4	0.2121 J1	5.4	7	52
1/23/2017	Background	0.01	4.26	3	< 0.083 U1	6.2	7	44
3/7/2017	Background	0.02	10.1	3	< 0.083 U1	4.8	16	64
4/26/2017	Background	0.02539	15	4	< 0.083 U1	5.3	27	82
5/16/2017	Background	0.03198	20.1	4	< 0.083 U1	5.7	33	60
6/13/2017	Background	0.04236	20.2	5	< 0.083 U1	5.2	31	114
8/28/2017	Detection	0.02674	12.7	4	< 0.083 U1	5.0	22	72
3/28/2018	Assessment	0.02271	14.8	2	< 0.083 U1	7.5	23	80
8/27/2018	Assessment	0.016	12.4	--	--	5.1	--	58
10/22/2018	Assessment	--	--	3.6	< 0.083 U1	--	21.1	--
3/12/2019	Assessment	0.02 J1	13.5	1.92	0.02 J1	7.1	21.3	82
6/10/2019	Assessment	< 0.04 U1	19.7	3.05	0.02 J1	6.9	20.7	98
8/28/2019	Assessment	< 0.02 U1	10.2	1	< 0.083 U1	5.4	18	64
3/23/2020	Assessment	--	--	1.82	0.02 J1	6.4	19.0	81
6/24/2020	Assessment	< 0.02 U1	16.3	1.93	0.01 J1	6.2	18.7	86
10/20/2020	Assessment	< 0.02 U1	13.0	1.63	0.02 J1	6.2	17.7	77
3/2/2021	Assessment	--	--	--	0.02 J1	5.8	--	--
6/21/2021	Assessment	0.015 J1	16.7	2.16	0.03 J1	6.4	18.2	90
9/21/2021	Assessment	0.012 J1	13.0	1.52	0.02 J1	5.6	16.4	60
3/15/2022	Assessment	--	--	--	< 0.02 U1	5.6	--	--
6/13/2022	Assessment	0.027 J1	16.4	2.64	0.02 J1	6.1	17.1	70 L1
9/21/2022	Assessment	0.013 J1	13.0	2.11	0.02 J1	6.3	15.7	60
3/7/2023	Assessment	--	--	--	< 0.02 U1	5.5	--	--
6/20/2023	Assessment	0.009 J1	10.9	1.57	< 0.02 U1	6.2	17.7	80
9/19/2023	Assessment	0.028 J1	18.9	3.58	0.03 J1	5.7	14.1	81

Table 1. Groundwater Data Summary: B-13

## Flint Creek - LF

## Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/23/2016	Background	< 0.93 U1	< 1.05 U1	53	0.122524 J1	0.107623 J1	2	1.81817 J1	0.4473	< 0.083 U1	< 0.68 U1	< 0.00013 U1	0.02179 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/19/2016	Background	< 0.93 U1	< 1.05 U1	60	0.224239 J1	< 0.07 U1	4	1.60103 J1	--	< 0.083 U1	1.35024 J1	0.002	0.01382 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/13/2016	Background	< 0.93 U1	< 1.05 U1	54	< 0.02 U1	< 0.07 U1	3	1.45223 J1	1.939	< 0.083 U1	< 0.68 U1	0.002	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/5/2016	Background	< 0.93 U1	< 1.05 U1	61	0.237762 J1	< 0.07 U1	5	2.78529 J1	0.829	< 0.083 U1	1.81371 J1	0.011	< 0.005 U1	0.539075 J1	< 0.99 U1	< 0.86 U1
11/8/2016	Background	< 0.93 U1	< 1.05 U1	32	0.28466 J1	0.256467 J1	4	1.50224 J1	0.3576	0.2121 J1	1.58806 J1	0.002	0.00767 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/23/2017	Background	< 0.93 U1	< 1.05 U1	36	0.29327 J1	< 0.07 U1	3	1.48125 J1	0.733	< 0.083 U1	< 0.68 U1	0.002	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/7/2017	Background	< 0.93 U1	< 1.05 U1	44	0.142049 J1	< 0.07 U1	2	0.769644 J1	0.841	< 0.083 U1	< 0.68 U1	0.002	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/26/2017	Background	< 0.93 U1	1.92 J1	66.22	0.22 J1	0.1 J1	4.05	1.94 J1	0.844	< 0.083 U1	1.02 J1	0.00252	0.021 J1	< 0.29 U1	1.68 J1	< 0.86 U1
5/16/2017	Background	< 0.93 U1	< 1.05 U1	71.99	0.13 J1	< 0.07 U1	2.26	0.99 J1	0.918	< 0.083 U1	< 0.68 U1	0.00133	< 0.005 U1	< 0.29 U1	1.38 J1	< 0.86 U1
6/13/2017	Background	< 0.93 U1	< 1.05 U1	72.45	0.12 J1	< 0.07 U1	2.61	1.26 J1	2.577	< 0.083 U1	< 0.68 U1	0.00151	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/28/2018	Assessment	< 0.93 U1	< 1.05 U1	56.76	< 0.02 U1	< 0.07 U1	1.45	0.53 J1	0.92	< 0.083 U1	< 0.68 U1	0.00101	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/27/2018	Assessment	0.02 J1	0.13	48.3	0.113	0.05	0.611	0.210	0.530	--	0.149	0.000775	< 0.005 U1	0.08 J1	0.5	0.02 J1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	< 0.083 U1	--	--	--	--	--	--
3/12/2019	Assessment	< 0.1 U1	0.62	55.4	0.2 J1	0.08 J1	1.76	1.08	0.882	0.02 J1	1.51	0.00115	< 0.005 U1	< 2 U1	0.8 J1	< 0.5 U1
6/10/2019	Assessment	< 0.02 U1	0.07 J1	55.1	0.05 J1	0.04 J1	0.379	0.03 J1	0.461	0.02 J1	< 0.05 U1	< 0.02 U1	< 0.005 U1	< 0.4 U1	0.5	< 0.1 U1
8/28/2019	Assessment	< 0.02 U1	0.17	47.1	0.151	0.05 J1	0.818	0.272	0.862	< 0.083 U1	0.221	0.000814	< 0.005 U1	< 0.4 U1	0.4	< 0.1 U1
3/23/2020	Assessment	< 0.02 U1	0.06 J1	49.0	0.06 J1	0.04 J1	0.459	0.03 J1	1.475	0.02 J1	< 0.05 U1	0.000578	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
6/24/2020	Assessment	< 0.02 U1	0.08 J1	52.3	0.05 J1	0.07	0.460	0.051	0.4377	0.01 J1	0.07 J1	0.000504	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
10/20/2020	Assessment	< 0.02 U1	0.06 J1	45.3	0.08 J1	0.05 J1	0.345	0.060	0.276	0.02 J1	0.05 J1	0.000604	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
3/2/2021	Assessment	< 0.02 U1	0.1 J1	46.3	0.06 J1	0.03 J1	0.464	0.116	0.179	0.02 J1	0.1 J1	0.000582	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
6/21/2021	Assessment	< 0.02 U1	0.18	54.1	0.065	0.036	0.99	0.245	0.51	0.03 J1	0.29	0.00056	< 0.002 U1	0.1 J1	0.49 J1	< 0.04 U1
9/21/2021	Assessment	< 0.02 U1	0.04 J1	46.1	0.064	0.035	0.55	0.029	0.60	0.02 J1	0.11 J1	0.00057	< 0.002 U1	< 0.1 U1	0.43 J1	< 0.04 U1
3/15/2022	Assessment	< 0.02 U1	0.09 J1	49.5	0.060	0.037	0.63	0.068	1.99	< 0.02 U1	< 0.05 U1	0.00058	< 0.004 U1	< 0.1 U1	0.40 J1	< 0.04 U1
6/13/2022	Assessment	< 0.02 U1	0.07 J1	51.7	0.044 J1	0.031	0.55	0.040	0.89	0.02 J1	< 0.05 U1	0.00045	< 0.200 U1	0.1 J1	0.36 J1	< 0.04 U1
9/21/2022	Assessment	< 0.02 U1	0.08 J1	46.7	0.066	0.032	0.81	0.072 B1	1.37	0.02 J1	0.06 J1	0.00056	< 0.200 U1	< 0.1 U1	0.37 J1	< 0.04 U1
3/7/2023	Assessment	< 0.02 U1	0.06 J1	53.8	0.046 J1	0.028	0.64	0.046	0.69	< 0.02 U1	0.08 J1	0.00050	< 0.002 U1	0.1 J1	0.31 J1	< 0.04 U1
6/20/2023	Assessment	0.014 J1	0.08 J1	42.3	0.085	0.034	0.63	0.106	0.81	< 0.02 U1	0.10 J1	0.00063	< 0.002 U1	< 0.1 U1	0.30 J1	< 0.02 U1
9/19/2023	Assessment	0.032 J1	0.1	57.5	0.042 J1	0.041	0.76	0.051	0.61	0.03 J1	< 0.05 U1	0.00047	< 0.002 U1	0.4 J1	0.48 J1	0.04 J1

**Table 1. Groundwater Data Summary  
Flint Creek - Landfill**

*Geosyntec Consultants, Inc.*

Notes:

--: Not analyzed

<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.

In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

B1: Analyte detected in method blank (MB) at or above the method criteria.

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

In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.

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

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

mg/L: milligrams per liter

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

P2: The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.

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

pCi/L: picocuries per liter

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

**Table 1: Residence Time Calculation Summary  
Flint Creek Landfill**

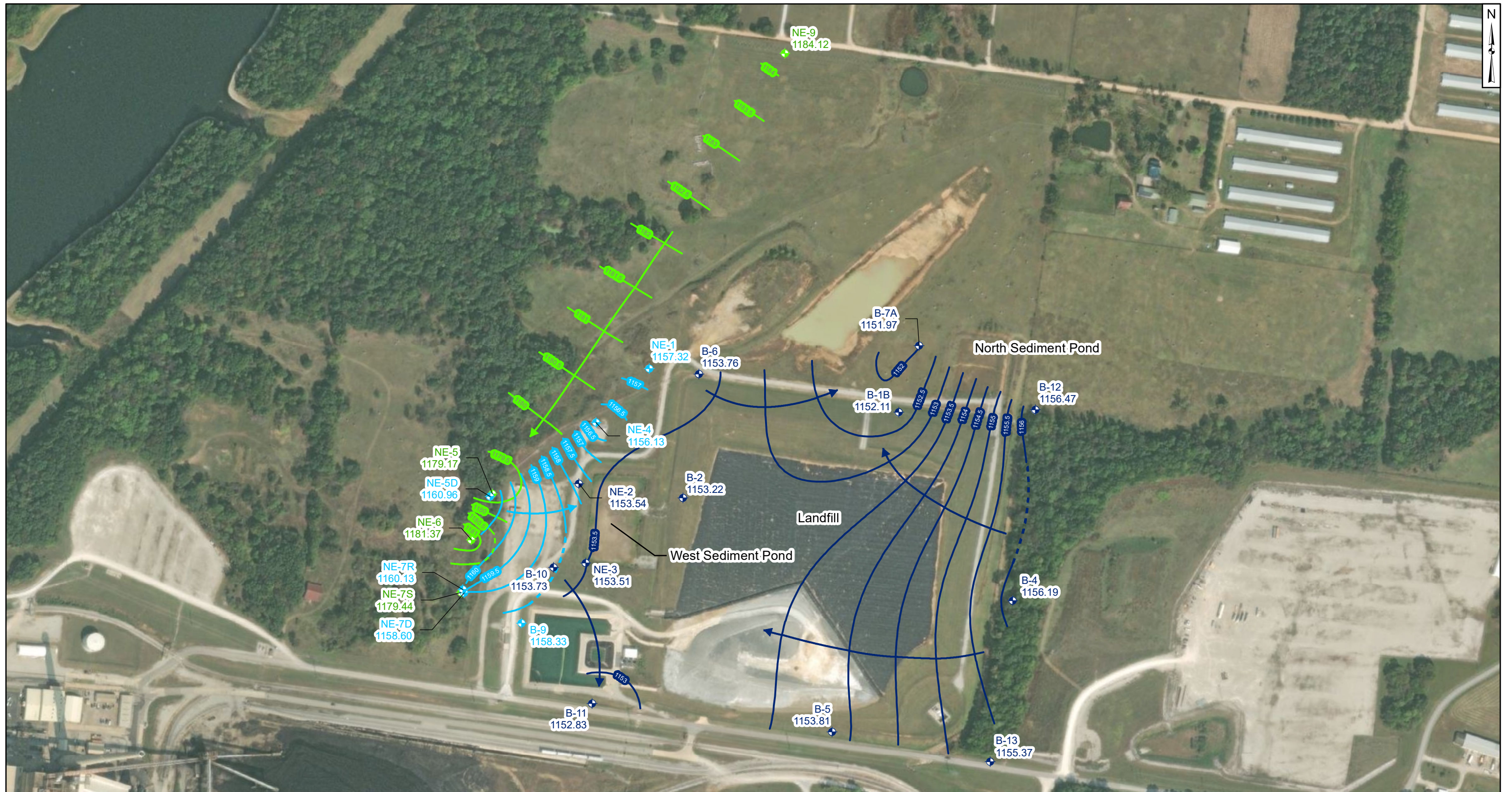
*Geosyntec Consultants, Inc.*

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2023-03		2023-06		2023-09		2023-12 <sup>[4]</sup>	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Landfill	B-1B <sup>[3]</sup>	2.0	239	0.3	250	0.2	103	0.6	231	0.3
	B-2 <sup>[2]</sup>	2.0	35	1.7	119	0.5	26	2.3	54	1.1
	B-4 <sup>[1]</sup>	2.0	135	0.5	62	1.0	40	1.5	99	0.6
	B-5 <sup>[3]</sup>	2.0	83	0.7	86	0.7	29	2.1	85	0.7
	B-6 <sup>[2]</sup>	2.0	97	0.6	116	0.5	52	1.2	76	0.8
	B-7A <sup>[3]</sup>	2.0	225	0.3	266	0.2	66	0.9	79	0.8
	B-9 <sup>[2]</sup>	2.0	93	0.7	38	1.6	59	1.0	64	1.0
	B-10 <sup>[2]</sup>	2.0	63	1.0	896	0.1	148	0.4	94	0.6
	B-11 <sup>[2]</sup>	2.0	45	1.3	46	1.3	80	0.8	42	1.4
	B-12 <sup>[1]</sup>	2.0	305	0.2	49	1.2	80	0.8	241	0.3
B-13 <sup>[1]</sup>	2.0	74	0.8	16	3.9	15	4.0	21	2.9	

Notes:

- [1] - Background Well
- [2] - Downgradient Well
- [3] - Crossgradient Well
- [4] - Verification event

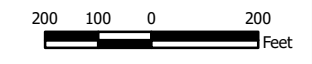




Monitoring Wells	Groundwater Elevation Contour
Shallow	Shallow
Intermediate	Shallow, Inferred
Deep	Shallow Flow Direction
	Intermediate
	Intermediate, Inferred
	Intermediate Flow Direction
	Deep
	Deep, Inferred
	Deep Flow Direction

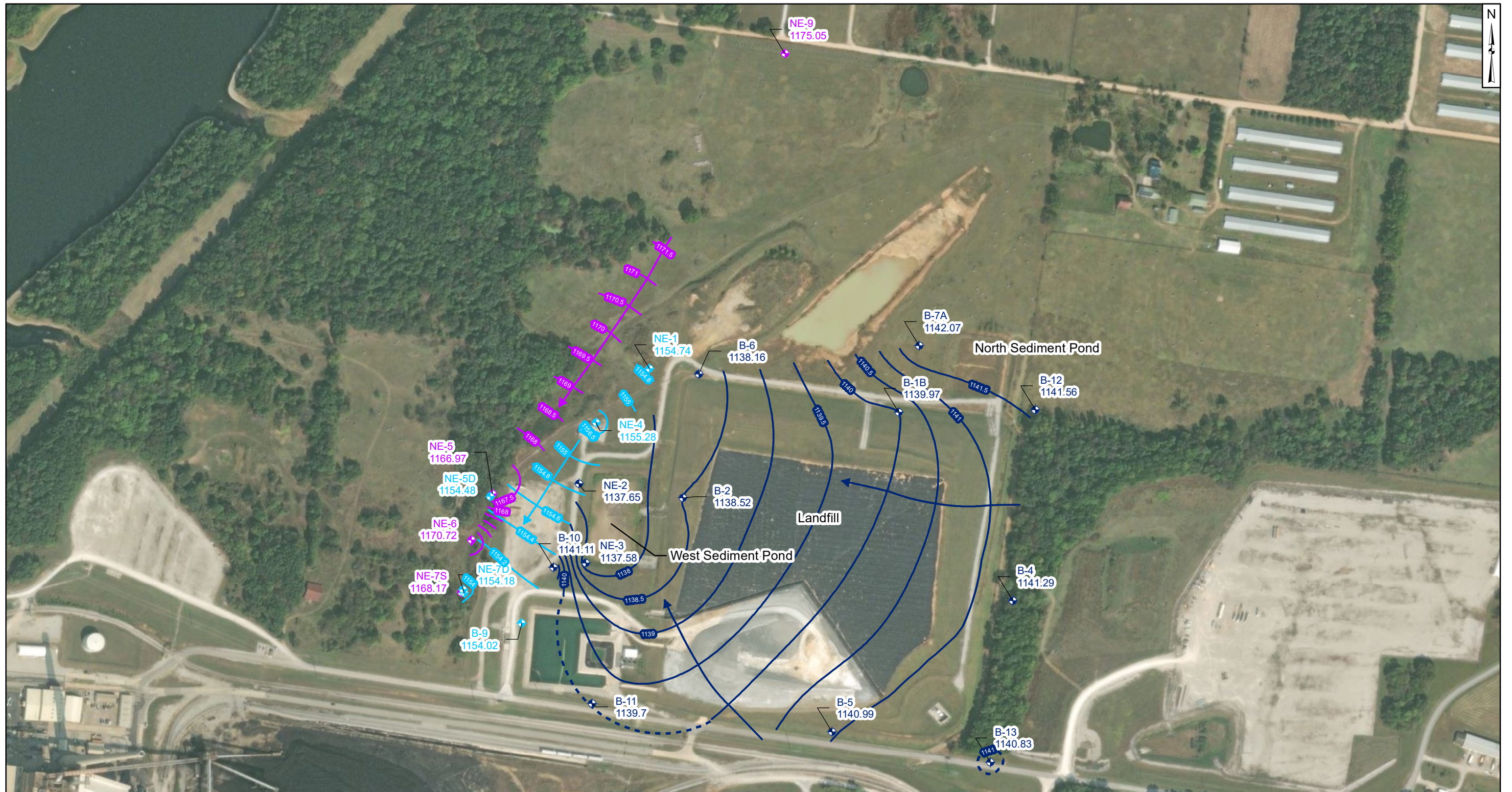
**Notes**

- Monitoring well coordinates and water level data (collected on March 6 and 7, 2023) provided by AEP.
- Site features are based on information available in the Groundwater Monitoring Well Network for CCR Compliance (Terracon, 2016) provided by AEP (Update with new survey data under way).
- Groundwater elevation units are feet above mean sea level.
- Well locations resurveyed on February 2 and 3, 2023 (Datum: AR SP North NAD27, NGVD29).



<b>Potentiometric Surface Map March 2023</b>	
AEP Flint Creek Plant - Landfill Gentry, Arkansas	
<b>Geosyntec</b> consultants	
Columbus, Ohio	2023/05/26
<b>Figure 1</b>	





Monitoring Wells	Groundwater Elevation Contour
Shallow	Shallow
Intermediate	Shallow Flow Direction
Deep	Intermediate
	Intermediate Flow Direction
	Deep
	Deep, Inferred
	Deep Flow Direction

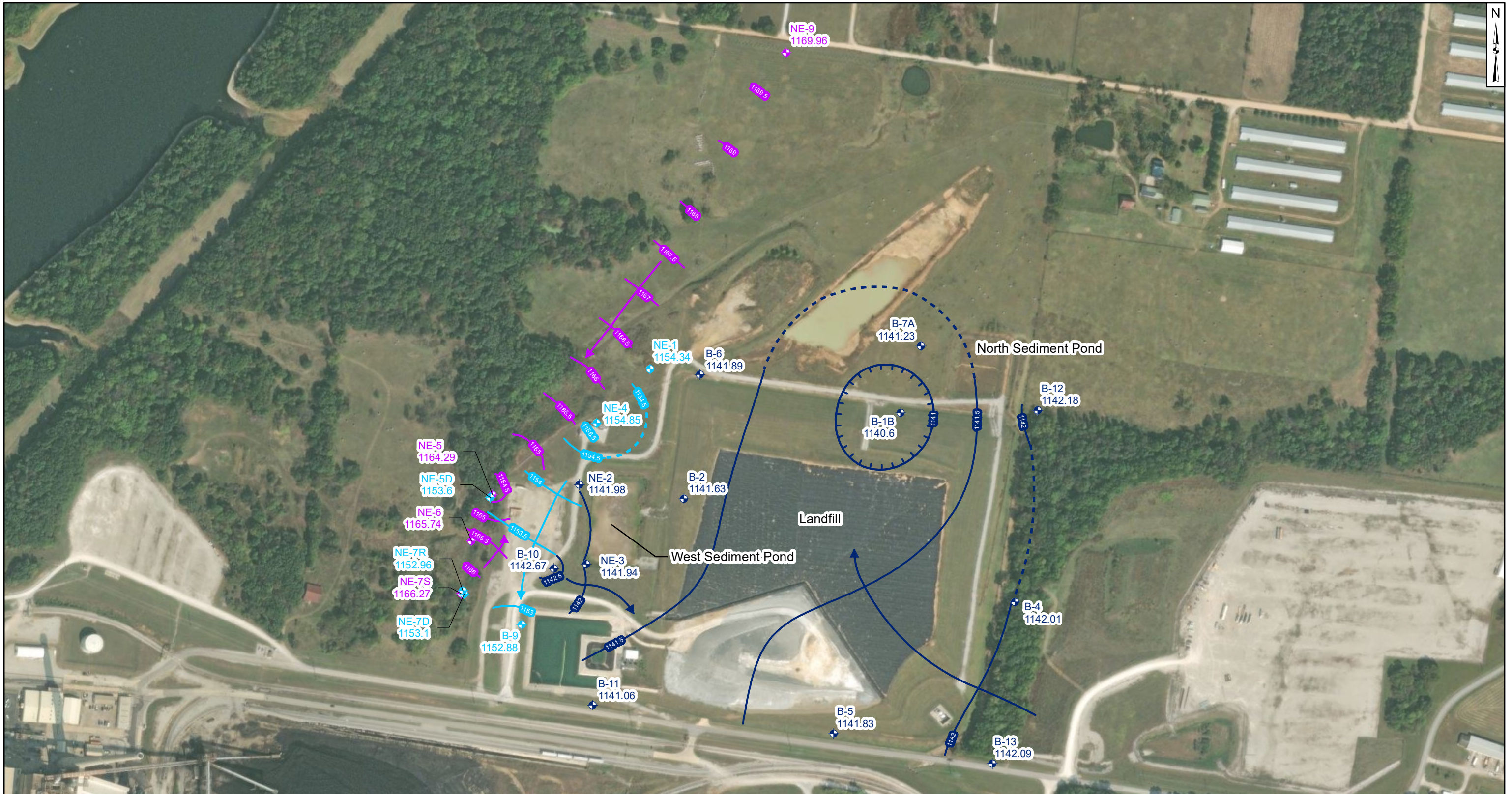
**Notes**

- Monitoring well coordinates and water level data (collected on June 19, 2023) provided by AEP.
- Site features are based on information available in the Groundwater Monitoring Well Network for CCR Compliance (Terracon, 2016) provided by AEP (Update with new survey data under way).
- Groundwater elevation units are feet above mean sea level.
- Well locations resurveyed on February 2 and 3, 2023 (Datum: AR SP North NAD27 NGVD29).



<b>Potentiometric Surface Map June 2023</b>	
AEP Flint Creek Plant - Landfill Gentry, Arkansas	
<b>Geosyntec</b> consultants	
Columbus, Ohio	2023/09/13
<b>Figure 2</b>	

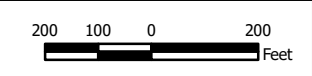




Monitoring Wells	Groundwater Elevation Contour
◆ Shallow	— Shallow
◆ Intermediate	→ Shallow Flow Direction
◆ Deep	— Intermediate
	- - - Intermediate, Inferred
	→ Intermediate Flow Direction
	— Deep
	- - - Deep, Inferred
	→ Deep Flow Direction
	⌊ Groundwater Depression

**Notes**

1. Monitoring well coordinates and water level data (collected on September 18, 2023) provided by AEP.
2. Site features are based on information available in the Groundwater Monitoring Well Network for CCR Compliance (Terracon 2016) provided by AEP (Update with new survey data under way).
3. Groundwater elevation units are feet above mean sea level.
4. Well locations resurveyed on February 2 and 3, 2023 (Datum: AR SP North NAD27 NGVD29).



<b>Potentiometric Surface Map</b> <b>September 2023</b>	
AEP Flint Creek Plant - Landfill Gentry, Arkansas	
<b>Geosyntec</b> consultants	
Columbus, Ohio	2023/11/14
<b>Figure 3</b>	



## **APPENDIX 2 - Statistical Analyses**

The January and October 2023 statistical analysis summaries follow. A memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues also follows.



**STATISTICAL ANALYSIS SUMMARY**  
**LANDFILL**  
**Flint Creek Plant**  
**Gentry, Arkansas**

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*



engineers | scientists | innovators

500 West Wilson Bridge Road  
Suite 250  
Worthington, Ohio 43085

January 18, 2023

CHA8500B

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## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LF	Landfill
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
MB	Method Blank
MCL	Maximum Contaminant Level
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
SU	Standard Units
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit

## SECTION 1

### EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257 Subpart D, "CCR rule"), groundwater monitoring has been conducted at the Landfill (LF), an existing CCR unit at the Flint Creek Power Plant located in Gentry, Arkansas. Recent groundwater monitoring results were compared to site-specific groundwater protection standards (GWPSs) to identify potential exceedances.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron at the LF. An alternative source was not identified at the time, so assessment monitoring was initiated at the LF in April 2018 and has continued at the unit in 2022. During 2022, an annual sampling event for Appendix IV parameters required by 257.95(b) was completed in March, and semiannual sampling events for both Appendix III parameters and Appendix IV parameters, as required by 257.95(d)(1), were completed in June and September. Statistical analysis of the March and June 2022 events did not show statistically significant levels (SSLs) above GWPSs, but also did not show a return to background levels; thus, the CCR unit remained in assessment monitoring (Geosyntec, 2022a). This report summarizes the statistical analysis results of the September 2022 semiannual assessment monitoring event.

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 from the Appendix IV parameter data at the compliance wells to assess whether any were present at SSLs above the corresponding 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.

## SECTION 2

### LANDFILL EVALUATION

#### 2.1 Data Validation & QA/QC

During the September 2022 assessment monitoring sampling event, one set of samples was collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(d)(1). Samples from this sampling event 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.9.6.36 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 LF were conducted in accordance with the October 2020 *Statistical Analysis Plan* (Geosyntec, 2020). Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in September 2022 were screened for potential outliers; however, no outliers were identified (Attachment B).

##### 2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (Geosyntec, 2020). The established GWPS was determined to be the greater value of the background concentration and either the maximum contaminant level (MCL) or risk-based level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. GWPSs were previously established in January 2022 (Geosyntec, 2022b); this

evaluation incorporated data from the March 2022, June 2022, and September 2022 assessment monitoring events.

Non-parametric tolerance limits were calculated for arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium, fluoride, lead, lithium, and selenium due to apparent non-normal distributions. Non-parametric tolerance limits were calculated for antimony, mercury, molybdenum, and thallium because greater than 50% of the data was composed of non-detect results. 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 for Appendix IV parameters were identified at the Flint Creek LF.

### **2.2.3 Updating Appendix III Prediction Limits**

Upper prediction limits (UPLs) were originally 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, pH, sulfate, and total dissolved solids (TDS), whereas an interwell test was used to evaluate potential SSIs for boron. Prediction limits have been updated periodically during the assessment monitoring period as sufficient data became available. Insufficient data was available to update the intrawell prediction limits during this statistical evaluation. However, the interwell prediction limit for boron was updated using data through September 2022.

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 by transformation. 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.

The interwell UPL for boron was updated using all historical data through September 2022 to represent the background value. The updated prediction limit for boron and the previous intrawell

prediction limits for calcium, chloride, fluoride, pH, sulfate, and TDS are summarized in Table 3. The UPLs 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 lower prediction limit (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 allow achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

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

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Prediction limits were calculated for the Appendix III parameters to represent background values as described in Section 2.2.3. Data collected during the September 2022 assessment monitoring event from each compliance well were compared to prediction limits to assess whether the results are statistically above background limits. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the UPLs were noted:

- Boron concentrations exceeded the interwell UPL of 0.107 mg/L at B-2 (0.419 mg/L), and B-11 (0.337 mg/L).
- The chloride concentration at B-11 (8.38 mg/L) exceeded the intrawell UPL of 7.54 mg/L.

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the September 2022 sample was above the UPL or below the LPL. Based on this evaluation, concentrations of Appendix III constituents appear to be above background concentrations and the unit will remain in assessment monitoring.

### **2.3 Conclusions**

A semiannual assessment monitoring event was conducted in September 2022 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 September 2022 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 GWPSs. No SSLs for Appendix IV parameters were identified.

The interwell prediction limit for boron was updated to incorporate more recent data. The Appendix III parameters were compared to prediction limits, with exceedances identified for boron and chloride.

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

## **SECTION 3**

### **REFERENCES**

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Landfill, Flint Creek Plant, Gentry, Arkansas, January 2018.

Geosyntec. 2020. Statistical Analysis Plan. October 2020.

Geosyntec. 2022a. Statistical Analysis Summary – Landfill, Flint Creek Plant, Gentry, Arkansas, October 14, 2022.

Geosyntec. 2022b. Statistical Analysis Summary – Landfill, Flint Creek Plant, Gentry, Arkansas, January 20, 2022.



# TABLES

**Table 1 - Groundwater Data Summary  
Flint Creek Plant - Landfill**

Parameter	Unit	B-1B	B-2	B-4	B-5	B-6	B-7A	B-9	B-10	B-11	B-12	B-13
		9/21/2022	9/20/2022	9/20/2022	9/21/2022	9/20/2022	9/20/2022	9/21/2022	9/21/2022	9/21/2022	9/20/2022	9/21/2022
Antimony	µg/L	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.02 J1	0.03 J1	0.18	0.1 U1	0.14	0.1 U1
Arsenic	µg/L	0.17	0.23	0.07 J1	0.47	0.16	5.21	0.53	0.92	0.17	0.13	0.08 J1
Barium	µg/L	108 P3	58.6	56.3	18.6	37.8 P3	62.4	164	90.1	96.0	45.8	46.7
Beryllium	µg/L	0.016 J1	0.059	0.172	0.478	0.010 J1	0.016 J1	0.05 U1	0.039 J1	0.287	0.008 J1	0.066
Boron	mg/L	0.011 J1	0.419	0.078	0.05 U1	0.024 J1	0.013 J1	0.012 J1	0.013 J1	0.337	0.014 J1	0.013 J1
Cadmium	µg/L	0.007 J1	0.024	0.032	0.159	0.011 J1	0.014 J1	0.008 J1	0.046	0.076	0.021	0.032
Calcium	mg/L	80.3 M1, P3	29.3	15.1	15.1	36.7 M1, P3	88.0	83.7	75.1	11.9	49.3	13.0
Chloride	mg/L	2.18	3.57	3.05	9.93	6.66	3.12	5.37	11.4	8.38	6.97	2.11
Chromium	µg/L	0.28	1.57	0.82	2.61	1.95	0.40	0.90	4.53	1.15	0.87	0.81
Cobalt	µg/L	0.015 B1, J1	0.079 B1	0.048 B1	0.247 B1	0.081 B1	0.863 B1	0.161 B1	1.11 B1	0.115 B1	2.75 B1	0.072 B1
Combined Radium	pCi/L	7.95	2.53	1.23	2.33	1.05	2.6	0.5	1.22	1.09	0.74	1.37
Fluoride	mg/L	0.37	0.10	0.02 J1	0.07	0.02 J1	0.19	0.07	0.11	0.06 U1	0.04 J1	0.02 J1
Lead	µg/L	0.2 U1	0.2 U1	0.2 U1	0.11 J1	0.06 J1	0.24	0.08 J1	0.60	0.2 U1	0.09 J1	0.06 J1
Lithium	mg/L	0.0241	0.00102	0.00089	0.00227	0.00034	0.0174	0.00279	0.00190	0.00161	0.00105	0.00056
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.004 J1	0.005 U1	0.004 J1	0.005 U1	0.005 U1	0.005 U1	0.5 U1	0.5 U1
Molybdenum	µg/L	0.5	1.5	0.5 U1	0.5 U1	0.2 J1	0.2 J1	0.3 J1	1.8	0.5 U1	0.6	0.5 U1
Selenium	µg/L	0.5 U1	7.32	0.38 J1	36.3	1.53	0.5 U1	0.39 J1	0.54	2.37	0.10 J1	0.37 J1
Sulfate	mg/L	15.5	67.9	9.48	255	15.1	34.8	34.2	28.5	42.3	7.52	15.7
Thallium	µg/L	0.2 U1	0.05 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	280	220	80	410	170	300	290	270	130	180	60
pH	SU	6.95	5.97	6.22	5.83	6.13	7.16	6.7	6.83	6.39	6.52	6.31

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.

-: Not sampled

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

P3: The precision on the MSD was above acceptance limits.

B1: Analyte detected in method blank (MB) or above the method criteria.

**Table 2 - Appendix IV Groundwater Protection Standards  
Flint Creek Plant - Landfill**

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.00500	0.00600
Arsenic, Total (mg/L)	0.0100		0.00800	0.0100
Barium, Total (mg/L)	2.00		0.131	2.00
Beryllium, Total (mg/L)	0.00400		0.00100	0.00400
Cadmium, Total (mg/L)	0.00500		0.00100	0.00500
Chromium, Total (mg/L)	0.100		0.00600	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00500	0.00600
Combined Radium, Total (pCi/L)	5.00		8.79	8.79
Fluoride, Total (mg/L)	4.00		1.00	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00500	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0410	0.0410
Mercury, Total (mg/L)	0.00200		0.0005000	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.0100	0.100
Selenium, Total (mg/L)	0.0500		0.0392	0.0500
Thallium, Total (mg/L)	0.00200		0.00200	0.00200

Notes:

MCL = Maximum Contaminant Level

CCR = Coal Combustion Residual

GWPS = Groundwater Protection Standard

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

Grey cells indicate the GWPS is based upon calculated UTL, which is higher than either the MCL or CCR-Rule Specified value.

**Table 3 - Appendix III Data Summary  
Flint Creek Plant - Landfill**

Analyte	Unit	Description	B-2	B-6	B-9	B-10	B-11
			9/20/2022	9/20/2022	9/21/2022	9/21/2022	9/21/2022
Boron	mg/L	Interwell Background Value (UPL)	0.107				
		Analytical Result	<b>0.419</b>	0.024	0.012	0.013	<b>0.337</b>
Calcium	mg/L	Intrawell Background Value (UPL)	53.6	58.8	134	116	18.1
		Analytical Result	29.3	36.7	83.7	75.1	11.9
Chloride	mg/L	Intrawell Background Value (UPL)	9.19	8.54	8.07	11.7	7.54
		Analytical Result	3.57	6.66	5.37	11.4	<b>8.38</b>
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	1.00	1.00	1.00	1.00
		Analytical Result	0.10	0.02	0.07	0.11	0.02
pH	SU	Intrawell Background Value (UPL)	7.1	7.3	8.2	8.5	6.8
		Intrawell Background Value (LPL)	5.2	6.1	6.3	6.2	5.0
		Analytical Result	6.0	6.1	6.7	6.8	6.4
Sulfate	mg/L	Intrawell Background Value (UPL)	202	41.0	37.6	36.7	64.3
		Analytical Result	67.9	15.1	34.2	28.5	42.3
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	488	279	307	304	184
		Analytical Result	220	170	290	270	130

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 Flint Creek Landfill CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER  
Printed Name of Licensed Professional Engineer

David Anthony Miller  
Signature

15296  
License Number

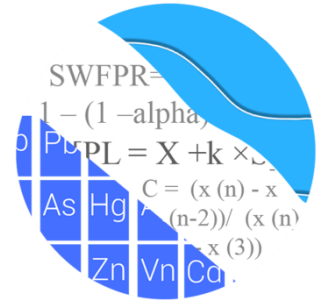
ARKANSAS  
Licensing State

01.20.23  
Date



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

# GROUNDWATER STATS CONSULTING



January 3, 2023

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

Re: Flint Creek Landfill - Assessment Monitoring & Background Update 2022

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide statistical analysis and background update of 2022 groundwater data for American Electric Power Inc.'s Flint Creek Landfill. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

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

- **Upgradient wells:** B-1B, B-4, B-5, B-7A, B-12, and B-13
- **Downgradient wells:** B-2, B-6, B-9, B-10, and B-11

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



The CCR program consists of the following constituents listed below. The terms “constituent” and “parameter” are interchangeable.

- **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 and box plots for Appendix III and IV parameters are provided for all wells (Figures A and B, respectively). Values which have been flagged as outliers may be seen in a lighter font and as a disconnected symbol on the time series plots. A summary of flagged values follows this letter (Figure C). The time series plots are used to evaluate concentrations over time and between wells, to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between wells.

For regulatory comparison of current observations against statistical limits for Appendix III constituents, the annual site-wide false positive rate is based on the USEPA Unified Guidance (2009) recommendation of 10% (5% for each semi-annual sample event). Power curves were included with the previous screening report and demonstrated that the selected statistical method provides sufficient power to detect a change at any of the downgradient wells which complies with the USEPA Unified Guidance recommendation. The EPA suggests the selected statistical method should provide at least 55% power at 3 standard deviations or at least 80% power at 4 standard deviations. Power curves were based on the following:

Semi-Annual Sampling

1-of-2 resample plan

# Constituents,  $c=7$

# Downgradient wells,  $w=5$

### **Summary of Statistical Methods – Appendix III Parameters:**

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

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. While the annual false positive rate associated with parametric limits is fixed at 10% as recommended by the EPA Unified Guidance (2009), the false positive rate associated with nonparametric limits is not fixed and depends upon the available background sample size, number of future comparisons, and verification resample plan. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits as appropriate. Non-detects are handled as follows:

- 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, the reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory. There is no replacement of historical reporting limits with the most recent reporting limit. For several constituents, the most recent reporting limits are significantly lower than those reported historically. This is a conservative approach for statistical limits at this site.
- 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.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In the interwell case, prediction limits are updated with upgradient well data following each sampling event after careful screening for any new outliers. In some cases, deselecting the earlier portion of data may be necessary prior to construction of limits so that resulting statistical limits are conservative (i.e., lower) from a regulatory perspective and capable of rapidly detecting 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 November 2017**

Interwell prediction limits combined with a 1-of-2 verification strategy were recommended for boron; and intrawell prediction limits combined with a 1-of-2 verification strategy were recommended for calcium, chloride, fluoride, pH, sulfate, and TDS. All proposed background data were screened for outliers and trends during the background screening. The findings of those reports were submitted with that analysis. Interwell prediction limits utilize pooled upgradient well data for construction of statistical limits. During each sample event, upgradient well data are screened for any newly suspected outliers or obvious trending patterns using time series plots. Intrawell prediction limits utilize historical data within a given well for comparison of compliance data from the same well. As recommended in the EPA Unified Guidance (2009), the background data sets are periodically evaluated for the purpose of updating statistical limits, as described below.

### **Appendix III Background Update Summaries**

#### **November 2019**

Samples from all wells for parameters using intrawell prediction limits and from all upgradient wells for parameters using interwell prediction limits were evaluated using Tukey's outlier test and visual screening. A summary of Tukey's test results and flagged outliers were included with the November 2019 background update.

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2017 to the new compliance samples at each well through March 2019 to evaluate whether the groups are statistically different at the 99% confidence level. When the test finds no statistically significant difference between the medians of the two groups, background data may be updated with compliance data. Although statistically significant differences were found for some well/constituent pairs which use intrawell statistical methods, all background data were updated with compliance data because while the medians were slightly different, the more recent reported concentrations were similar to historical concentrations. A complete list of the Mann-Whitney test results and associated statistical explanations were included with the November 2019 Background Update report. Intrawell prediction limits were updated for each well and constituent using the updated background data through March 2019. A summary table and complete graphical results were included with the report.

For boron, which is tested using interwell prediction limits, the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. No statistically significant increasing or decreasing trends were noted. The interwell prediction limit, combined with a 1-of-2 resample plan, was updated using all available data from upgradient wells for the same time period for boron. Results were included with the November 2019 Background Update report.

## **February 2021**

Prior to updating background data for the 2021 analysis, Tukey's outlier test and visual screening were used to re-evaluate data for outliers at all upgradient wells for parameters utilizing interwell prediction limits, i.e., boron. (Figure C). Tukey's outlier test on pooled upgradient well data identified eleven values as outliers. Those values were similar to each other and not dramatically higher than the remaining observations. Therefore, no values were flagged in upgradient wells for Appendix III parameters. A summary of Tukey's test results and flagged outliers were included with the February 2021 background update.

As mentioned above, in the intrawell case, data for all wells and constituents are re-evaluated when a minimum of 4 new data points are available. Calcium lacked sufficient data to update background at the time; therefore, background data sets for all parameters utilizing intrawell prediction limits were updated during the January 2022 analysis.

For boron, which is tested using interwell prediction limits, the Sen's Slope/Mann-Kendall trend test was used to test data in upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. A statistically significant increasing trend was identified for boron in upgradient well B-4; however, the magnitude of the trend was small relative to the range of concentrations in the pooled upgradient data. Therefore, all data from upgradient wells were used to construct interwell prediction limits for boron.

## **January 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 June 2021 for outliers at all wells for parameters using intrawell prediction limits, i.e., calcium, chloride, fluoride, pH, sulfate, and TDS and through September 2021 for outliers at all upgradient wells for parameters utilizing interwell prediction limits, i.e., boron. For parameters which use intrawell

prediction limits, Tukey's outlier test on all wells identified three values as outliers. Only a high value for chloride in downgradient well B-6 was flagged as the other values were not substantially higher than remaining observations within the respective well/constituent pairs. While Tukey's test did not identify the highest measurement in the more recent chloride data at upgradient well B-4, the value was flagged as an outlier to construct a conservative (i.e., lower) statistical limit.

Tukey's outlier test on pooled upgradient well data identified high values for boron; however, those values were all reported at similar concentrations and were not dramatically higher than the remaining observations. Therefore, no values were flagged in upgradient wells for boron based on Tukey's outlier test or visual screening. Tukey's outlier test results for all Appendix III parameters are shown in Figure C. A list of flagged outliers follows this report.

### Intrawell - Mann-Whitney Evaluation

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through March 2019 to the new compliance samples through June 2021 at each well to evaluate whether the groups are statistically different at the 99% confidence level. When no statistically significant difference is found, background data may be updated with compliance data. Statistically significant differences (either an increase or decrease in median concentrations) were found between the two groups for the following well/constituent pairs:

Increase:

- Sulfate: B-5 (upgradient) and B-9

Decrease:

- Calcium: B-4 (upgradient)
- Chloride: B-4 (upgradient), B-13 (upgradient), B-2, and B-9
- Fluoride: B-4 (upgradient), B-5 (upgradient), B-7A (upgradient), B-12 (upgradient), B-13 (upgradient), B-2, B-6, B-9, B-10, and B-11
- Sulfate: B-2
- TDS: B-2

Typically, when the test concludes that the medians of the two groups are statistically significantly different, particularly in the downgradient wells, the background data are not updated to include the newer data, unless it can be reasonably justified that the change in concentrations reflects a naturally occurring shift unrelated to practices at the site. In

studies such as the current one, in which at least one of the segments being compared is of short duration, the comparison is complicated by the fact that normal short-term variation may be mistaken for long-term change in medians.

Regarding well/constituent pairs with statistically significant increases in medians, the records for sulfate in upgradient well B-5 and downgradient well B-9 could not be updated since the increases in concentrations would lead to constructing statistical limits that would be difficult to detect any potential release from the facility.

Regarding well/constituent pairs with statistically significant decreases in medians, earlier portions of the background datasets were truncated to utilize, at a minimum, the most recent 8 measurements, which were at lower concentrations, in order to construct statistical limits that are conservative (i.e., lower) from a regulatory perspective:

- Calcium: B-4 (upgradient)
- Chloride: B-4 (upgradient)
- Sulfate: B-2
- TDS: B-2

For the remaining well/constituent pairs with statistically significant decreases in medians, the group of more recent reported concentrations for chloride were similar to those reported historically. Additionally, the statistically significant decrease in medians identified by the Mann-Whitney test for fluoride was a result of historic non-detect values in the earlier portion of the record being compared to more recent trace values in the latter part of the record. Therefore, the following background datasets were updated through June 2021 for the following well/constituent pairs in order to construct statistical limits that are representative of present-day groundwater quality:

- Chloride: B-13 (upgradient), B-2, and B-9
- Fluoride: B-4 (upgradient), B-5 (upgradient), B-7A (upgradient), B-12 (upgradient), B-13 (upgradient), B-2, B-6, B-9, B-10, and B-11

Note that for fluoride, the intrawell prediction limit is the detection limit of 1 mg/L. While the non-detects at this level appear to be outliers, the remaining values in the data set are all trace values reported at very low levels where the measurement precision is also low. Therefore, the non-detects are not flagged for the present, but may be flagged in the future. The statistically significant decrease in medians identified by the Mann-

Whitney test was a result of historic non-detect values in the earlier portion of the record being compared to more recent trace values in the latter part of the record.

### Interwell – Trend Test Evaluation

For boron, which is tested using interwell prediction limits, the Sen's Slope/Mann-Kendall trend test was used to test data in upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. A statistically significant increasing trend was identified for boron in upgradient well B-5; however, the trend is influenced by earlier trace values below the current reporting limit and varying reporting limits later in the record. Therefore, all data from upgradient wells were used to construct interwell prediction limits for boron. As more data are collected, all upgradient well data will be re-evaluated for possible deselection of earlier portion of the record if the measurements no longer represent present-day groundwater quality conditions.

### **Appendix III Parameters – September 2022**

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that are representative of the background data population, and that will rapidly identify a change in more recent compliance data from within a given well. The most recent sample from the same well is compared to its respective background. This statistical method removes the element of variation from across wells and eliminates the chance of mistaking natural spatial variation for a release from the facility. Intrawell prediction limits are updated when a minimum of 4 compliance samples are available. Sufficient samples are not currently available; therefore, background limits will be updated during the Fall 2023 analysis.

Interwell prediction limits, which pool upgradient well data to establish a background limit for an individual constituent, were updated during this analysis after screening for new outliers. No new outliers were identified. The most recent sample from each downgradient well is compared to the interwell prediction limits to determine whether initial exceedances are present. Upgradient wells for Appendix III parameters will be re-evaluated for outliers and trends during the Fall 2023 analysis.

### Prediction Limits

Intrawell prediction limits for calcium, chloride, fluoride, pH, sulfate, and TDS currently use all historical data through June 2021, unless otherwise noted above, and a summary table of the limits follows this report (Figure D). Previously flagged outliers may be seen in a

lighter font and as a disconnected symbol on the graphs, and a summary of all flagged outliers follows this report (Figure C).

The interwell prediction limit for boron, combined with a 1-of-2 resample plan, was constructed using all pooled upgradient data through September 2022. The summary table follows this letter (Figure E).

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of one 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 is required to identify the cause of the exceedance (i.e., impact from the site, natural variation, or an off-site source). If a resample falls within the statistical limit, the initial exceedance is considered to be a false positive result; therefore, no further action is necessary.

## **Appendix IV Parameters – September 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. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Tukey's outlier test identified outliers for barium, chromium, cobalt, combined radium 226 + 228, fluoride, and lithium when pooled upgradient well data were evaluated; however, many of these values were of similar concentration to one another and thus, were not flagged as outliers. The highest detected value for chromium in well B-12, the two highest detected values for cobalt in well B-12, and the high reporting limit for lithium at several wells during the June 2019 event remain flagged in the database as outliers as they did not appear to represent the population at these wells and do not represent current conditions.

For the current analysis, downgradient well data through September 2022 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 were flagged during this analysis, and previously flagged outliers for barium at well B-10 were unflagged due to



more recent concentrations being similar. Several outliers were flagged during previous analyses for reasons listed below.

Several metals had higher reported concentrations in multiple wells during the September and November 2016 events which appear to be either a laboratory or sampling issue. Therefore, these values were flagged as outliers since they do not represent the population within these wells. Additionally, several reporting limits for the metals are significantly lower beginning in March 2019 than those reported historically. Non-detect values are not replaced with the most recent reporting limit in order to create conservative statistical limits from a regulatory perspective. As discussed previously, the reporting limit for lithium during the June 2019 event increased from a historical limit of 0.001 mg/L to 0.1 mg/L. Therefore, this value was flagged as an outlier in all applicable wells as it is higher than any reported concentrations for lithium.

#### Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through September 2022 for Appendix IV parameters (Figure F). 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. While a higher reporting limit of 0.0005 mg/L was noted for mercury at upgradient wells B-12 and B-13, this reporting limit is still an order of magnitude lower than the MCL of 0.002 mg/L.

#### Groundwater Protection Standards

These background limits were compared to the Maximum Contaminant Levels (MCLs) and CCR Rule-Specified levels 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 G).

#### Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through September 2022 for each of the Appendix IV parameters and compared to the GWPS, i.e., the highest limit of the MCL, CCR Rule-Specified level, 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 H). No statistical exceedances were identified.

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

For Groundwater Stats Consulting,



Andrew T. Collins  
Project Manager



Kristina L. Rayner  
Senior Statistician

# Date Ranges

Date: 12/29/2022 9:56 AM

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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Calcium, total (mg/L)

B-2 background:10/7/2016-6/21/2021

B-4 background:6/16/2017-6/22/2021

Chloride, total (mg/L)

B-4 background:3/26/2018-6/22/2021

Sulfate, total (mg/L)

B-2 background:11/8/2016-6/21/2021

B-5 background:5/25/2016-3/12/2019

B-9 background:5/25/2016-3/12/2019

Total Dissolved Solids [TDS] (mg/L)

B-2 background:11/8/2016-6/21/2021

# Intrawell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:40 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	B-10	116	n/a	n/a	1 future	n/a	19	n/a	n/a	n/a	0	n/a	n/a	0.004832	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	B-11	18.12	n/a	n/a	1 future	n/a	19	13.3	2.315	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-12	74.42	n/a	n/a	1 future	n/a	19	62.6	5.681	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-13	22.85	n/a	n/a	1 future	n/a	19	13.65	4.419	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-1B	95.4	n/a	n/a	1 future	n/a	19	88.34	3.394	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-2	53.56	n/a	n/a	1 future	n/a	16	28.35	11.73	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-4	9.552	n/a	n/a	1 future	n/a	10	4.545	2.021	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-5	18.89	n/a	n/a	1 future	n/a	19	16.89	0.9571	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-6	58.78	n/a	n/a	1 future	n/a	19	43.94	7.134	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-7A	109	n/a	n/a	1 future	n/a	19	100.4	4.131	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-9	134.2	n/a	n/a	1 future	n/a	19	9.908	0.8056	0	None	sqrt(x)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-10	11.72	n/a	n/a	1 future	n/a	20	8.557	1.536	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-11	7.536	n/a	n/a	1 future	n/a	20	4.834	1.313	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-12	13.13	n/a	n/a	1 future	n/a	20	10.09	1.477	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-13	5.486	n/a	n/a	1 future	n/a	20	3.106	1.157	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-1B	5.417	n/a	n/a	1 future	n/a	20	1.426	0.1602	0	None	x^(1/3)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-2	9.19	n/a	n/a	1 future	n/a	20	5.54	1.774	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-4	6.351	n/a	n/a	1 future	n/a	8	3.136	1.173	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-5	10.84	n/a	n/a	1 future	n/a	20	7.668	1.543	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-6	8.535	n/a	n/a	1 future	n/a	19	2958	1128	0	None	x^4	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-7A	6.354	n/a	n/a	1 future	n/a	20	1.935	0.2848	0	None	sqrt(x)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-9	8.073	n/a	n/a	1 future	n/a	20	5.348	1.324	0	None	No	0.001504	Param Intra 1 of 2	
Fluoride, total (mg/L)	B-10	1	n/a	n/a	1 future	n/a	21	n/a	n/a	52.38	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-11	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-12	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-13	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-1B	1	n/a	n/a	1 future	n/a	21	n/a	n/a	19.05	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	B-2	1	n/a	n/a	1 future	n/a	20	n/a	n/a	65	n/a	n/a	0.004291	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-4	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-5	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-6	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-7A	1	n/a	n/a	1 future	n/a	21	n/a	n/a	47.62	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	B-9	1	n/a	n/a	1 future	n/a	21	n/a	n/a	47.62	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
pH, field (SU)	B-10	8.453	6.152	n/a	1 future	n/a	21	7.302	0.5629	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-11	6.784	4.956	n/a	1 future	n/a	22	5.87	0.4502	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-12	8.345	5.812	n/a	1 future	n/a	21	7.079	0.6193	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-13	7.464	4.292	n/a	1 future	n/a	21	5.878	0.7758	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-1B	8.169	6.336	n/a	1 future	n/a	21	7.253	0.4483	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-2	7.055	5.226	n/a	1 future	n/a	22	6.14	0.4504	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-4	7.962	5.633	n/a	1 future	n/a	21	6.798	0.5694	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-5	6.537	4.213	n/a	1 future	n/a	21	5.375	0.5683	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-6	7.265	6.099	n/a	1 future	n/a	22	6.682	0.2871	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-7A	8.487	6.34	n/a	1 future	n/a	21	7.413	0.5252	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-9	8.235	6.293	n/a	1 future	n/a	21	7.264	0.475	0	None	No	0.000752	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-10	36.74	n/a	n/a	1 future	n/a	20	28.73	3.894	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-11	64.25	n/a	n/a	1 future	n/a	20	43.51	10.08	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-12	17.45	n/a	n/a	1 future	n/a	20	9.894	3.673	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-13	32.91	n/a	n/a	1 future	n/a	20	20.09	6.23	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-1B	27.06	n/a	n/a	1 future	n/a	20	21.64	2.638	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-2	202.1	n/a	n/a	1 future	n/a	16	116.3	39.92	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-4	17.07	n/a	n/a	1 future	n/a	20	10.92	2.986	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-5	243.3	n/a	n/a	1 future	n/a	14	200	19.34	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-6	40.97	n/a	n/a	1 future	n/a	20	23.33	8.572	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-7A	37.22	n/a	n/a	1 future	n/a	20	33.67	1.723	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-9	37.64	n/a	n/a	1 future	n/a	14	22.71	6.675	0	None	No	0.001504	Param Intra 1 of 2	

# Intrawell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:40 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Total Dissolved Solids [TDS] (mg/L)	B-10	303.7	n/a	n/a	1 future	n/a	20	264	19.3	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-11	183.8	n/a	n/a	1 future	n/a	20	129.7	26.3	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-12	307.9	n/a	n/a	1 future	n/a	20	248.2	29.06	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-13	114.1	n/a	n/a	1 future	n/a	20	77.4	17.82	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-1B	316.1	n/a	n/a	1 future	n/a	20	275.4	19.78	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-2	488.2	n/a	n/a	1 future	n/a	16	303.7	85.8	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-4	109.7	n/a	n/a	1 future	n/a	20	72.5	18.07	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-5	452.4	n/a	n/a	1 future	n/a	20	402.8	24.09	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-6	278.5	n/a	n/a	1 future	n/a	20	193	41.57	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-7A	354	n/a	n/a	1 future	n/a	20	5.749	0.05824	0	None	ln(x)	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-9	307.2	n/a	n/a	1 future	n/a	20	249.8	27.9	0	None	No	0.001504	Param Intra	1 of 2

# Interwell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:44 AM

Constituent	Well	Upper Lim.	Lower Lim.	Lim.Date	Observ.	Sig.	Bg	N	Bg	Mean	Std.Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	0.107	n/a	n/a	5 future	n/a	126	n/a			n/a	17.46	n/a	n/a	0.0001245	NP Inter (normality) 1 of 2

# Upper Tolerance Limit Summary Table

Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF    Printed 12/29/2022, 12:20 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 144	n/a	n/a	64.58	n/a	n/a	0.0006197	NP Inter(NDs)
Arsenic, total (mg/L)	n/a	0.008	n/a	n/a	n/a	n/a 144	n/a	n/a	36.11	n/a	n/a	0.0006197	NP Inter(normality)
Barium, total (mg/L)	n/a	0.131	n/a	n/a	n/a	n/a 144	n/a	n/a	0	n/a	n/a	0.0006197	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	30.56	n/a	n/a	0.0006197	NP Inter(normality)
Cadmium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	38.19	n/a	n/a	0.0006197	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.006	n/a	n/a	n/a	n/a 143	n/a	n/a	7.692	n/a	n/a	0.0006523	NP Inter(normality)
Cobalt, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 142	n/a	n/a	2.817	n/a	n/a	0.0006867	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	n/a	8.79	n/a	n/a	n/a	n/a 138	n/a	n/a	0	n/a	n/a	0.0008431	NP Inter(normality)
Fluoride, total (mg/L)	n/a	1	n/a	n/a	n/a	n/a 150	n/a	n/a	45.33	n/a	n/a	0.0004556	NP Inter(normality)
Lead, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 143	n/a	n/a	44.06	n/a	n/a	0.0006523	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.041	n/a	n/a	n/a	n/a 138	n/a	n/a	1.449	n/a	n/a	0.0008431	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.0005	n/a	n/a	n/a	n/a 144	n/a	n/a	62.5	n/a	n/a	0.0006197	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.01	n/a	n/a	n/a	n/a 144	n/a	n/a	56.25	n/a	n/a	0.0006197	NP Inter(NDs)
Selenium, total (mg/L)	n/a	0.0392	n/a	n/a	n/a	n/a 144	n/a	n/a	47.92	n/a	n/a	0.0006197	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.002	n/a	n/a	n/a	n/a 144	n/a	n/a	89.58	n/a	n/a	0.0006197	NP Inter(NDs)

<b>FLINT CREEK LANDFILL GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR-Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.005	0.006
Arsenic, Total (mg/L)	0.01		0.008	0.01
Barium, Total (mg/L)	2		0.131	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.001	0.005
Chromium, Total (mg/L)	0.1		0.006	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.005	0.006
Combined Radium, Total (pCi/L)	5		8.79	8.79
Fluoride, Total (mg/L)	4		1	4
Lead, Total (mg/L)	n/a	0.015	0.005	0.015
Lithium, Total (mg/L)	n/a	0.04	0.041	0.041
Mercury, Total (mg/L)	0.002		0.0005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.01	0.1
Selenium, Total (mg/L)	0.05		0.0392	0.05
Thallium, Total (mg/L)	0.002		0.002	0.002

*\*Grey cell indicates background limit is higher than MCL or CCR-Rule Specified level*

*\*GWPS = Groundwater Protection Standard*

*\*MCL = Maximum Contaminant Level*

*\*CCR = Coal Combustion Residual*



# Confidence Intervals - All Results (No Significant)

Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF    Printed 12/29/2022, 12:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	B-10	0.005	0.00011	0.006	No	24	0.002363	0.002478	45.83	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-11	0.005	0.0001	0.006	No	24	0.002352	0.002481	91.67	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-2	0.001816	0.00004	0.006	No	24	0.001631	0.002165	45.83	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-6	0.005	0.00008	0.006	No	24	0.002202	0.002433	79.17	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-9	0.005	0.00003	0.006	No	24	0.002203	0.002432	50	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-10	0.005	0.00038	0.01	No	24	0.002412	0.002215	33.33	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-11	0.005	0.00017	0.01	No	23	0.002168	0.002419	30.43	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-2	0.002573	0.00022	0.01	No	24	0.00236	0.003818	16.67	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-6	0.003636	0.00018	0.01	No	24	0.001809	0.002043	25	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-9	0.005	0.00056	0.01	No	24	0.002255	0.002009	33.33	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-10	0.0831	0.078	2	No	24	0.08189	0.007604	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-11	0.1286	0.1027	2	No	23	0.1156	0.0248	0	None	No	0.01	Param.
Barium, total (mg/L)	B-2	0.08726	0.05327	2	No	23	0.07741	0.049	0	None	ln(x)	0.01	Param.
Barium, total (mg/L)	B-6	0.05953	0.04582	2	No	24	0.05268	0.01344	0	None	No	0.01	Param.
Barium, total (mg/L)	B-9	0.1598	0.1449	2	No	24	0.1524	0.0146	0	None	No	0.01	Param.
Beryllium, total (mg/L)	B-10	0.0005	0.000039	0.004	No	24	0.0003746	0.0004321	66.67	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	B-11	0.0004883	0.0002412	0.004	No	23	0.000439	0.0004033	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	B-2	0.0002025	0.00009238	0.004	No	23	0.000194	0.0002282	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	B-6	0.000103	0.00002427	0.004	No	24	0.0001603	0.0002293	20.83	Kaplan-Meier	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	B-9	0.0005	0.00003	0.004	No	24	0.000281	0.0003983	62.5	Kaplan-Meier	No	0.01	NP (NDs)
Cadmium, total (mg/L)	B-10	0.001	0.000026	0.005	No	24	0.000457	0.0004759	45.83	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-11	0.0003098	0.00009648	0.005	No	23	0.0003351	0.0004644	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	B-2	0.0008704	0.000024	0.005	No	24	0.0003661	0.0004516	29.17	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-6	0.00027	0.000018	0.005	No	24	0.0003448	0.0004364	37.5	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-9	0.001	0.00002	0.005	No	24	0.0004889	0.0004828	66.67	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	B-10	0.002	0.00059	0.1	No	24	0.003284	0.007849	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-11	0.00327	0.00092	0.1	No	23	0.003649	0.005571	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-2	0.004	0.00145	0.1	No	24	0.005135	0.008514	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-6	0.003793	0.002034	0.1	No	24	0.003181	0.00223	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	B-9	0.002279	0.001169	0.1	No	24	0.001724	0.001088	0	None	No	0.01	Param.
Cobalt, total (mg/L)	B-10	0.0009868	0.0002803	0.006	No	24	0.0007778	0.001014	4.167	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-11	0.0006994	0.0001727	0.006	No	23	0.0009169	0.001545	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	B-2	0.0006091	0.000135	0.006	No	22	0.000769	0.001323	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	B-6	0.001252	0.0003005	0.006	No	24	0.0009944	0.001163	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-9	0.0009983	0.0003882	0.006	No	24	0.0006932	0.0005978	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-10	1.487	0.9603	8.79	No	23	1.224	0.5036	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-11	1.67	0.835	8.79	No	23	2.001	2.844	0	None	No	0.01	NP (normality)
Combined Radium 226 + 228 (pCi/L)	B-2	2.096	1.254	8.79	No	23	1.742	0.8743	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-6	1.695	0.6227	8.79	No	23	1.847	3.045	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-9	1.87	0.7201	8.79	No	23	1.563	1.883	0	None	x^(1/3)	0.01	Param.
Fluoride, total (mg/L)	B-10	1	0.1	4	No	25	0.5153	0.443	44	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	B-11	1	0.04	4	No	25	0.5772	0.4869	64	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-2	1	0.09	4	No	24	0.5829	0.4633	54.17	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-6	1	0.03	4	No	25	0.5471	0.4835	60	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-9	1	0.09	4	No	25	0.4813	0.4381	40	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-10	0.005	0.00014	0.015	No	24	0.002041	0.002211	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-11	0.0005856	0.00009387	0.015	No	23	0.001964	0.002618	47.83	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-2	0.0004891	0.00008299	0.015	No	23	0.001761	0.003025	34.78	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-6	0.001398	0.0003134	0.015	No	24	0.001116	0.001378	4.167	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	B-9	0.005	0.0002	0.015	No	24	0.001938	0.002229	54.17	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	B-10	0.00357	0.00137	0.041	No	23	0.0032	0.003389	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-11	0.004802	0.001715	0.041	No	23	0.005119	0.007342	0	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	B-2	0.005	0.00102	0.041	No	23	0.004933	0.007027	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-6	0.00238	0.000407	0.041	No	22	0.001381	0.001197	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-9	0.00409	0.00272	0.041	No	23	0.004043	0.002972	0	None	No	0.01	NP (normality)

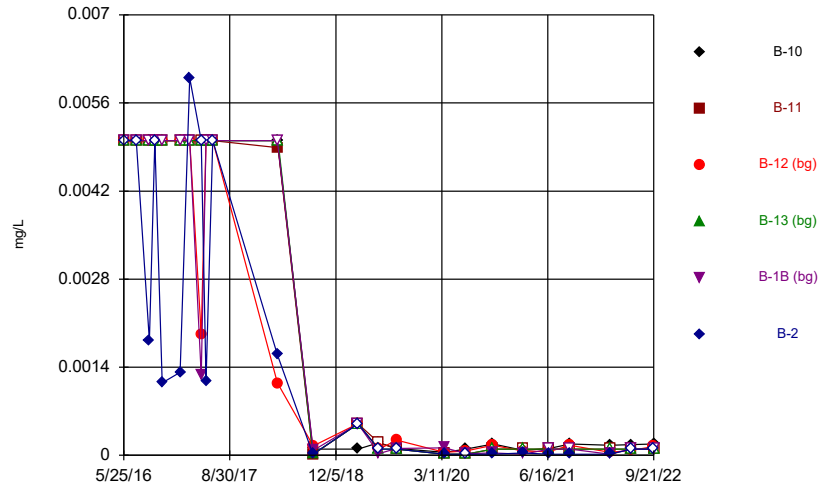
# Confidence Intervals - All Results (No Significant)

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/29/2022, 12:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Mercury, total (mg/L)	B-10	0.000025	0.000005	0.002	No	24	0.00001511	0.000009939	75	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-11	0.000025	0.000005	0.002	No	24	0.00002021	0.00001921	87.5	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-2	0.000025	0.000005	0.002	No	24	0.00001621	0.00001224	75	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-6	0.00001261	0.000005	0.002	No	24	0.00001127	0.000008551	58.33	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-9	0.000025	0.000005	0.002	No	24	0.00001565	0.00000996	87.5	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-10	0.00155	0.0007	0.1	No	24	0.00197	0.002673	8.333	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	B-11	0.005	0.0005	0.1	No	24	0.00268	0.002527	75	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-2	0.002556	0.0009775	0.1	No	24	0.002144	0.002242	8.333	None	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	B-6	0.0004922	0.0002754	0.1	No	24	0.001761	0.002402	41.67	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	B-9	0.005	0.0004	0.1	No	24	0.004484	0.007208	62.5	Kaplan-Meier	No	0.01	NP (NDs)
Selenium, total (mg/L)	B-10	0.005	0.00041	0.05	No	24	0.002532	0.00232	45.83	None	No	0.01	NP (normality)
Selenium, total (mg/L)	B-11	0.002963	0.002135	0.05	No	24	0.002973	0.001184	16.67	Kaplan-Meier	No	0.01	Param.
Selenium, total (mg/L)	B-2	0.02057	0.0067	0.05	No	24	0.01775	0.01885	0	None	No	0.01	NP (normality)
Selenium, total (mg/L)	B-6	0.002515	0.00151	0.05	No	24	0.002098	0.001091	4.167	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	B-9	0.005	0.0004	0.05	No	24	0.002549	0.002308	50	None	No	0.01	NP (normality)
Thallium, total (mg/L)	B-10	0.002	0.0002	0.002	No	24	0.00117	0.0008833	91.67	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-11	0.002	0.0002	0.002	No	24	0.001114	0.0008648	91.67	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-2	0.002	0.0001	0.002	No	24	0.001028	0.0008721	75	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-6	0.002	0.0002	0.002	No	24	0.001092	0.0008453	87.5	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-9	0.002	0.0002	0.002	No	24	0.001138	0.0008674	87.5	None	No	0.01	NP (NDs)

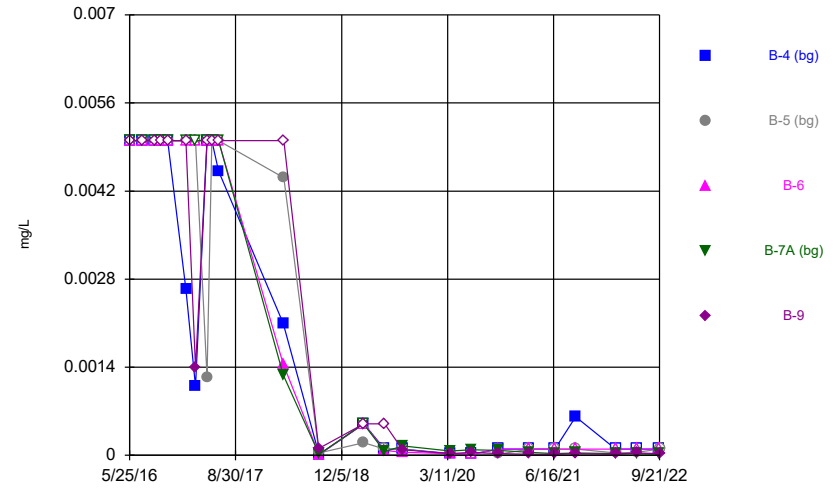
FIGURE A.

### Time Series



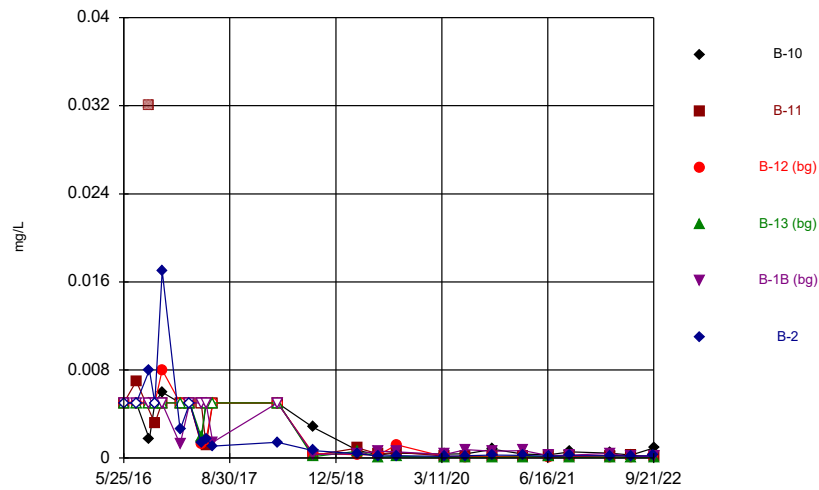
Constituent: Antimony, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



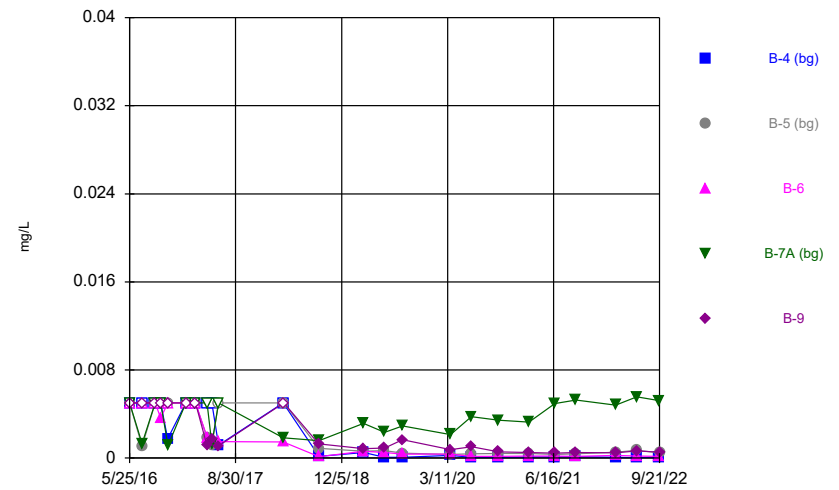
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



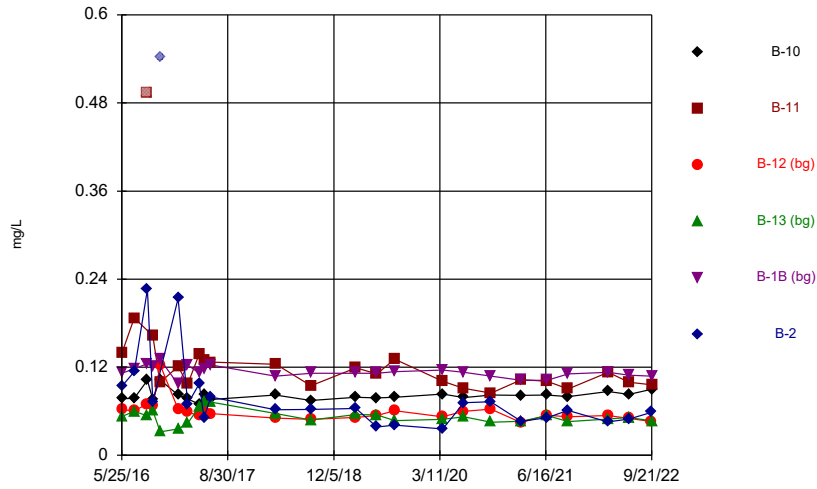
Constituent: Arsenic, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



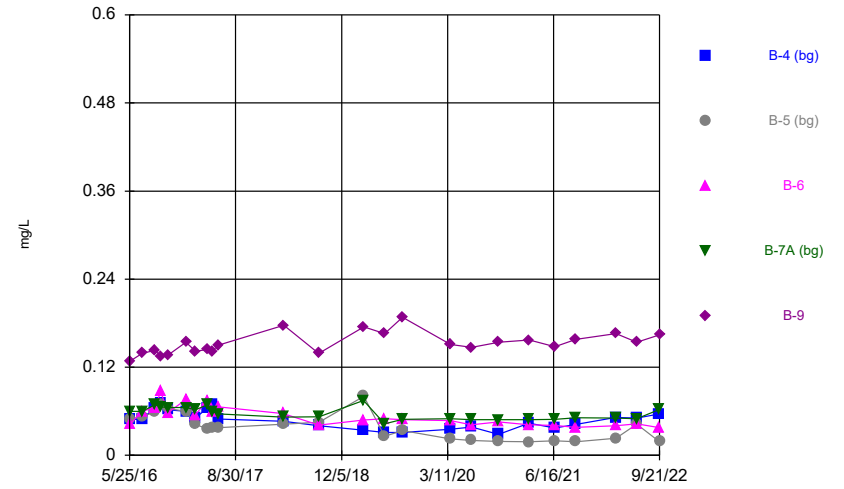
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



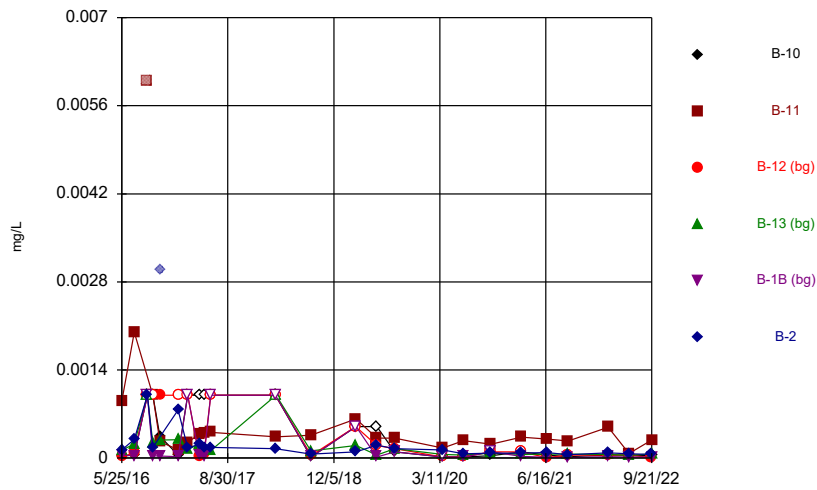
Constituent: Barium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



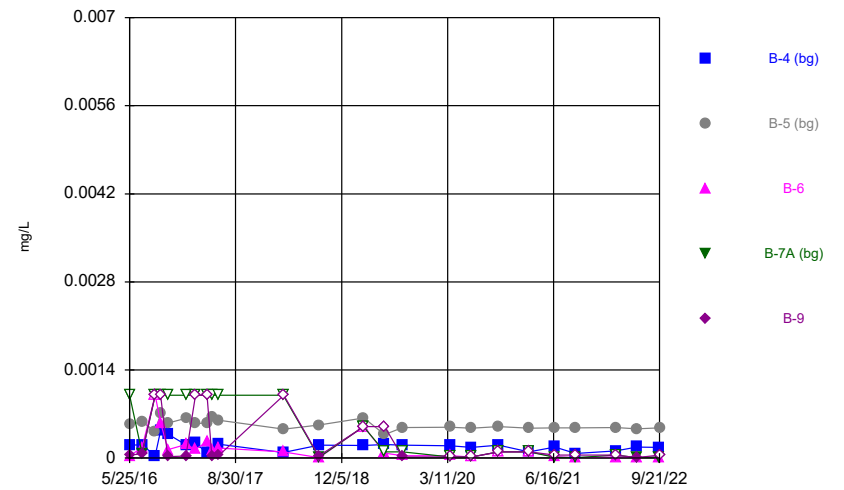
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



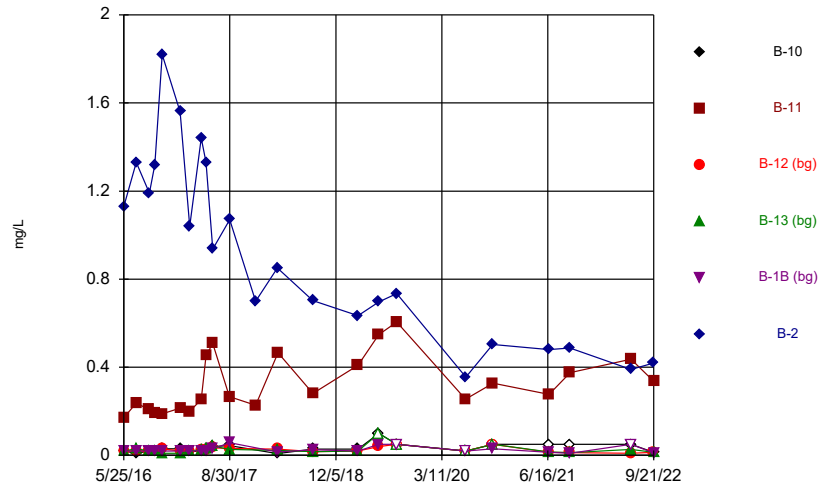
Constituent: Beryllium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



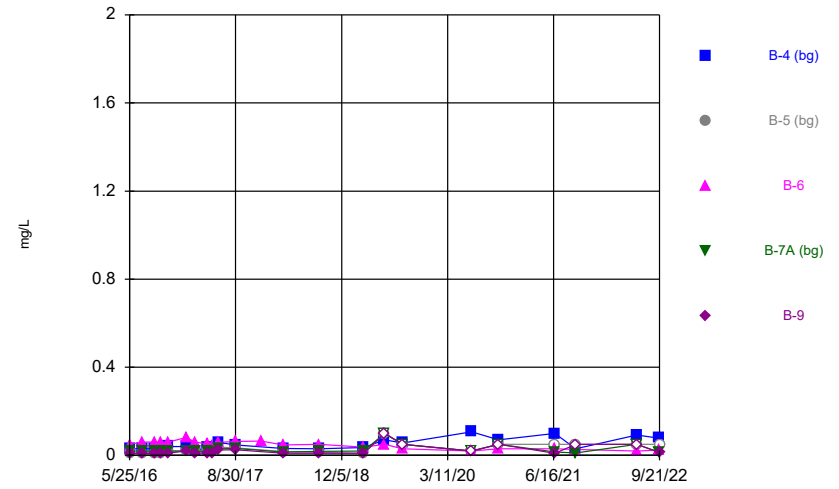
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



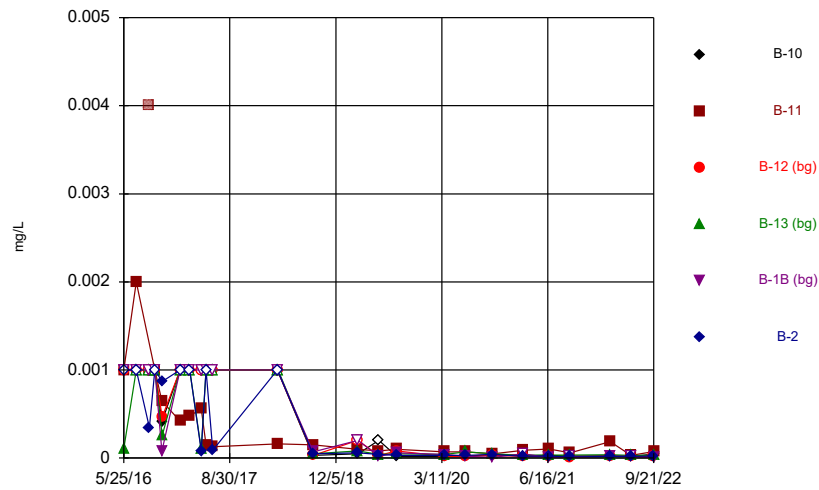
Constituent: Boron, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



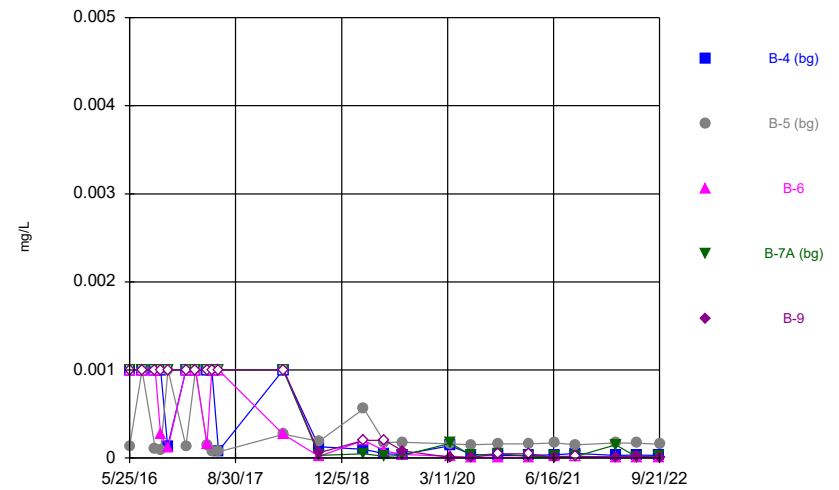
Constituent: Boron, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



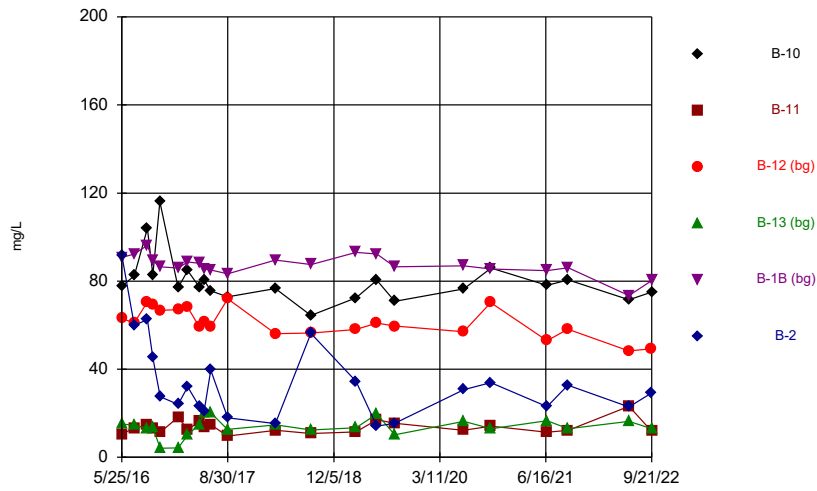
Constituent: Cadmium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



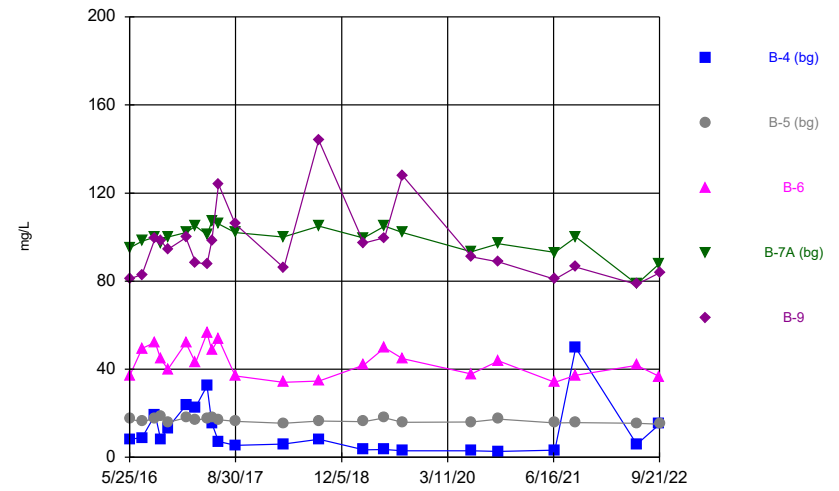
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



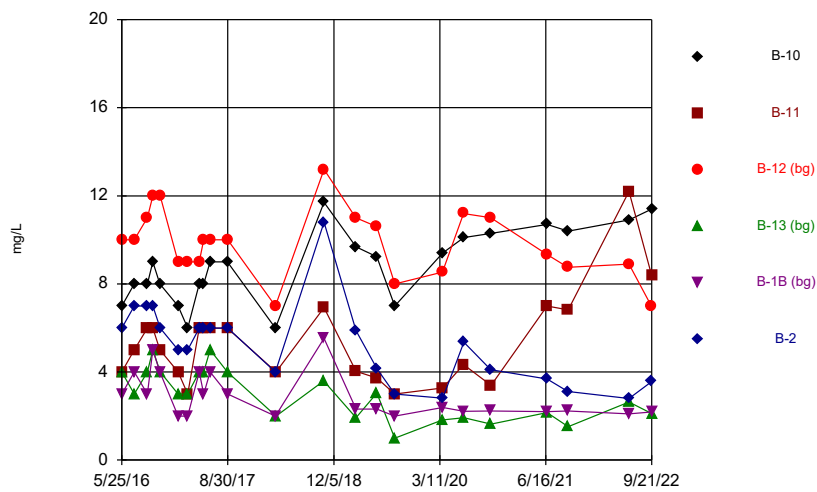
Constituent: Calcium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



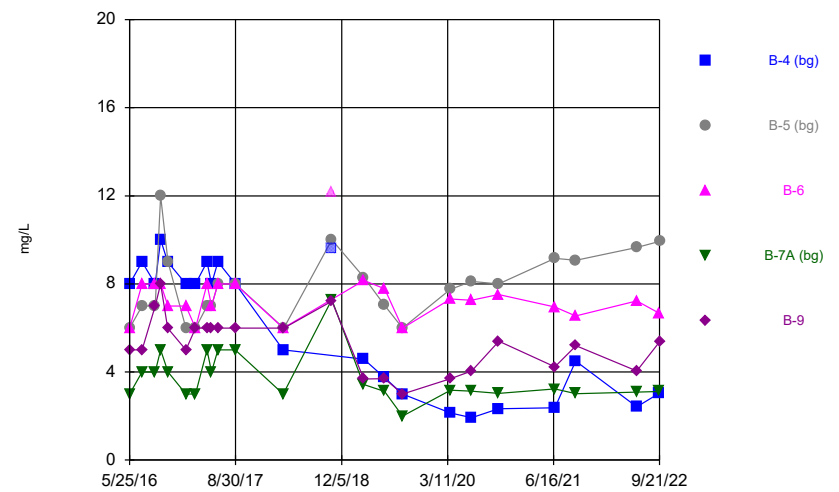
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



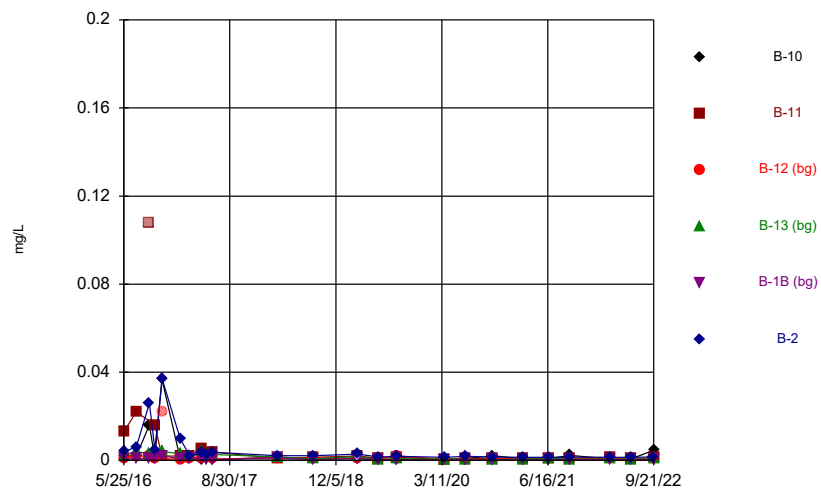
Constituent: Chloride, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



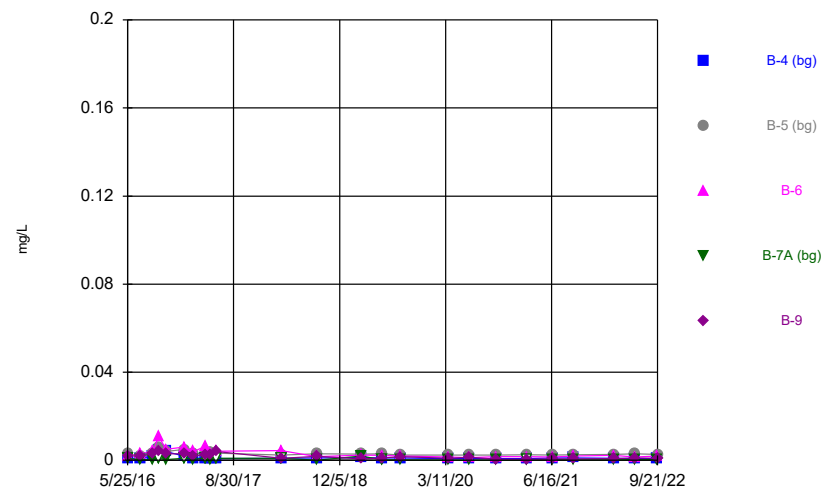
Constituent: Chloride, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



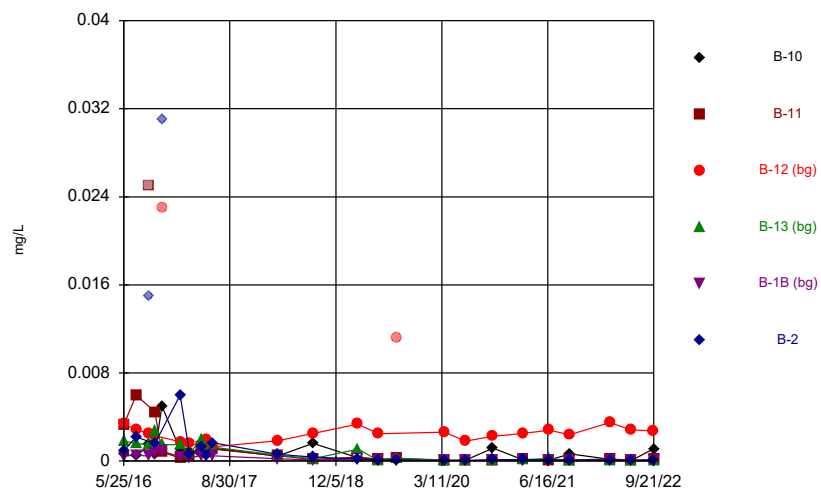
Constituent: Chromium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



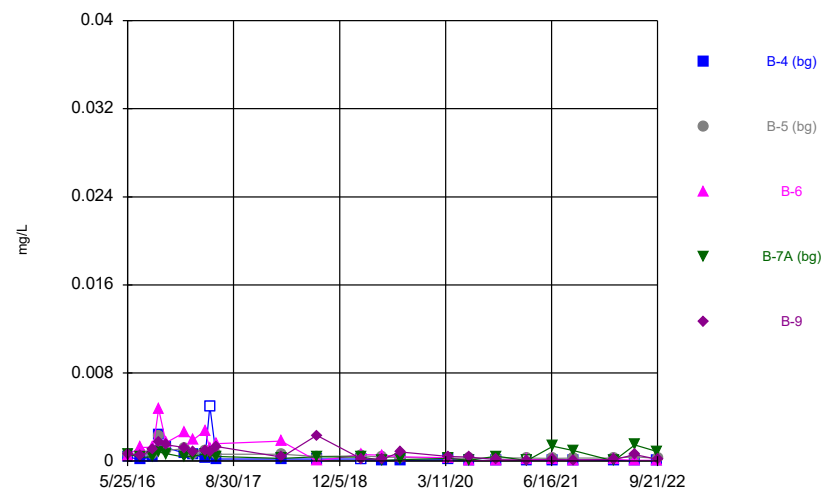
Constituent: Chromium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



Constituent: Cobalt, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

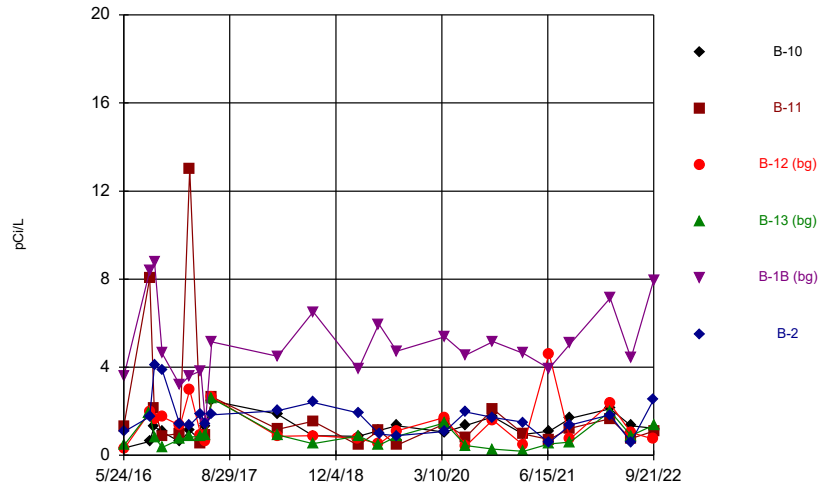
Time Series



Constituent: Cobalt, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

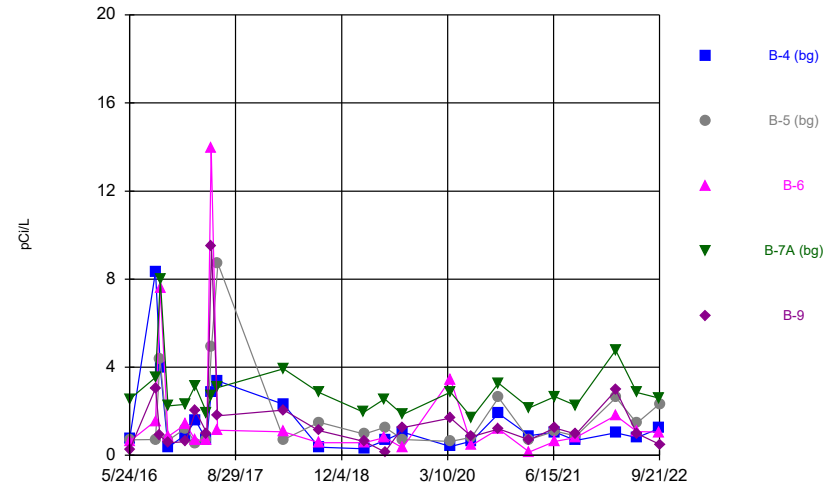


Time Series



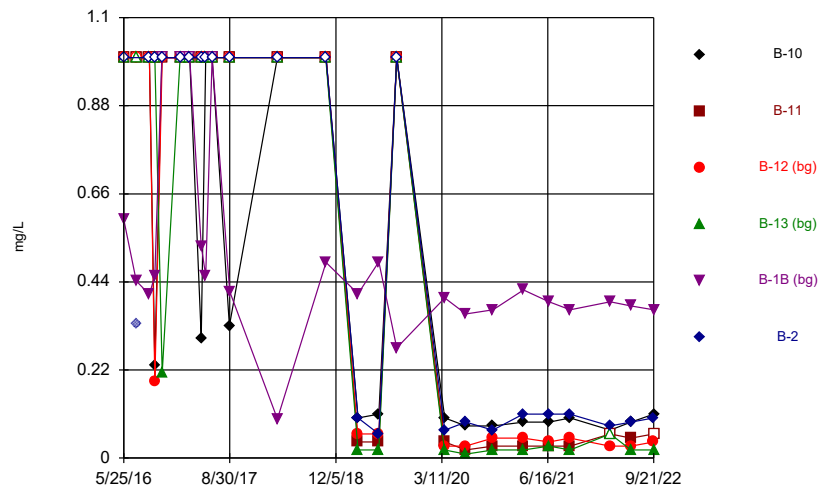
Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



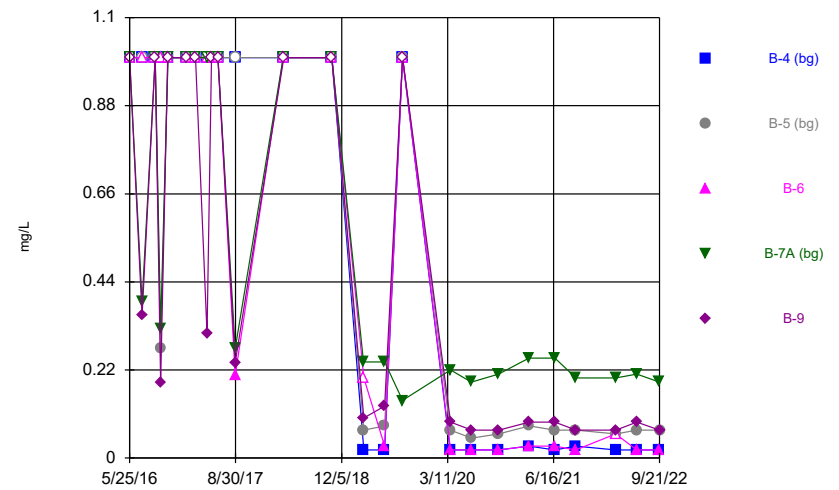
Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



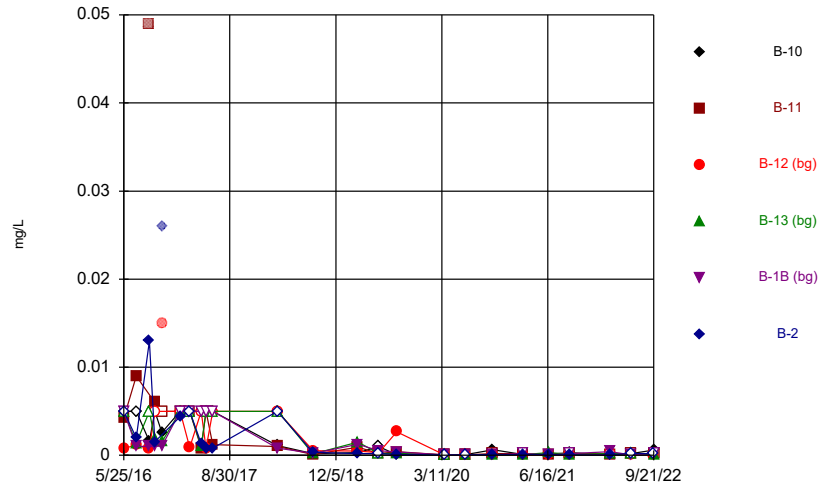
Constituent: Fluoride, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



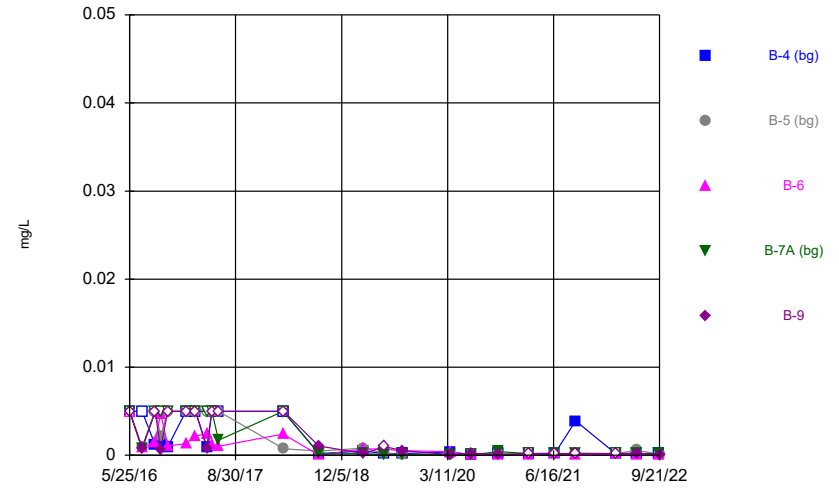
Constituent: Fluoride, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



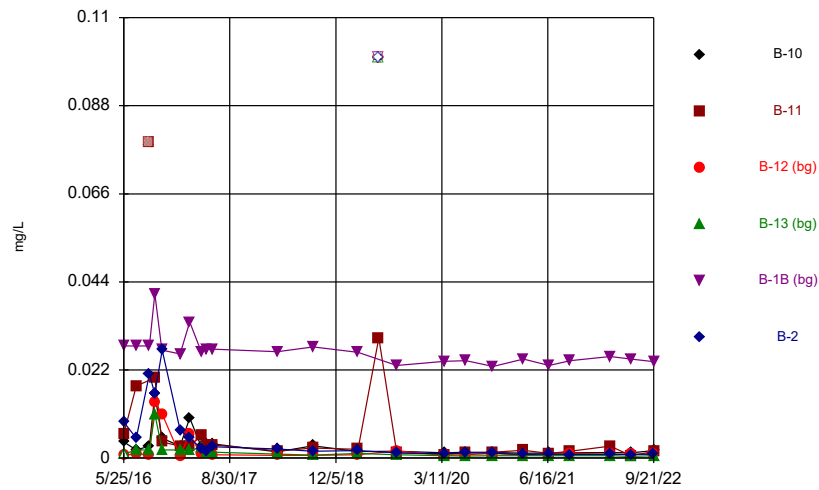
Constituent: Lead, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



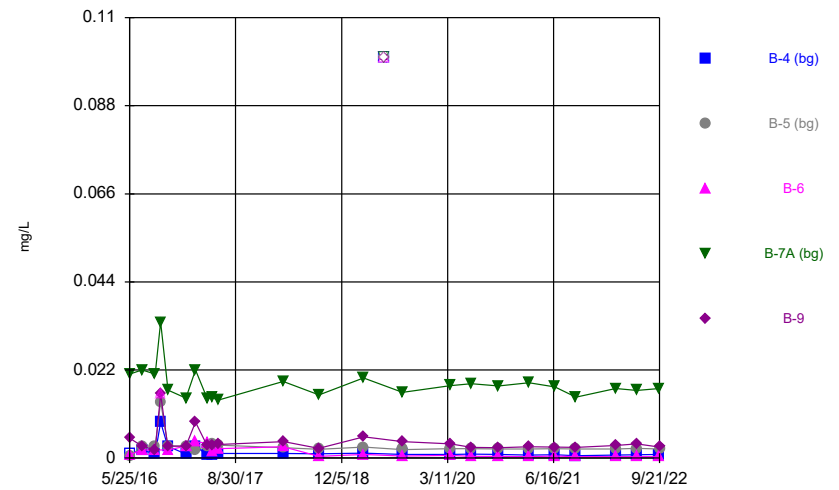
Constituent: Lead, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



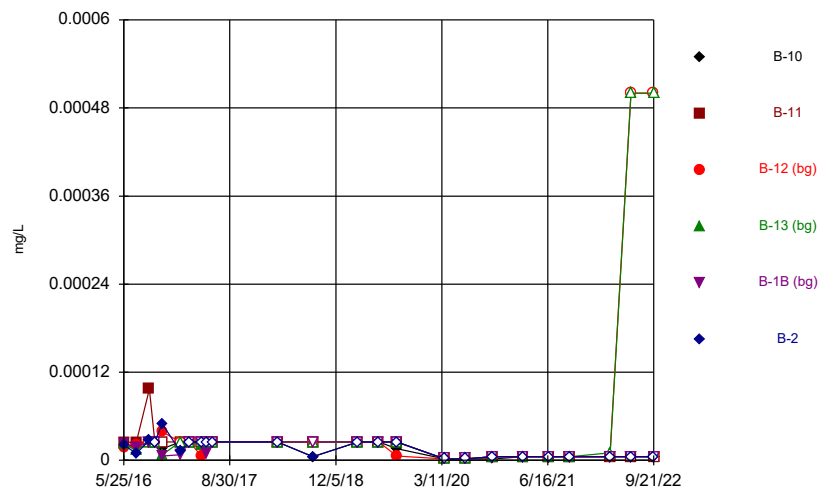
Constituent: Lithium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



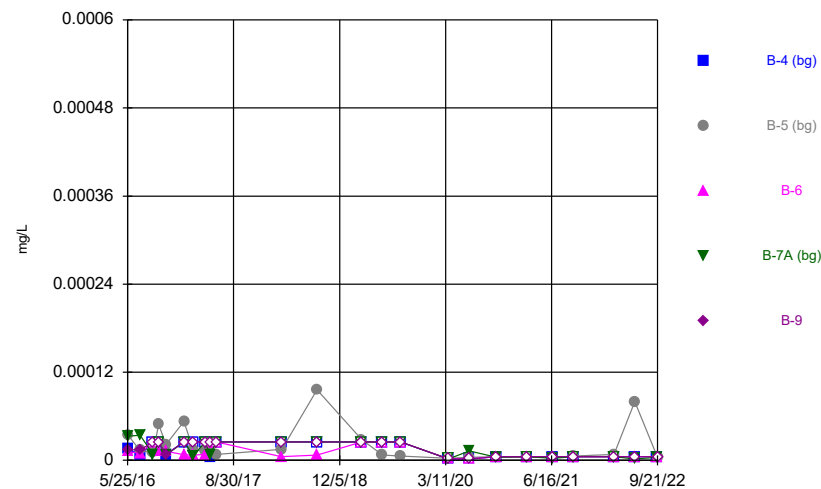
Constituent: Lithium, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



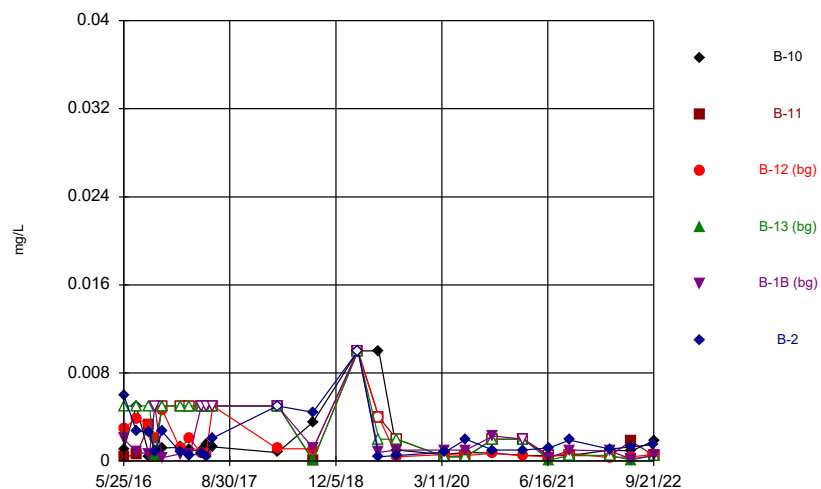
Constituent: Mercury, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



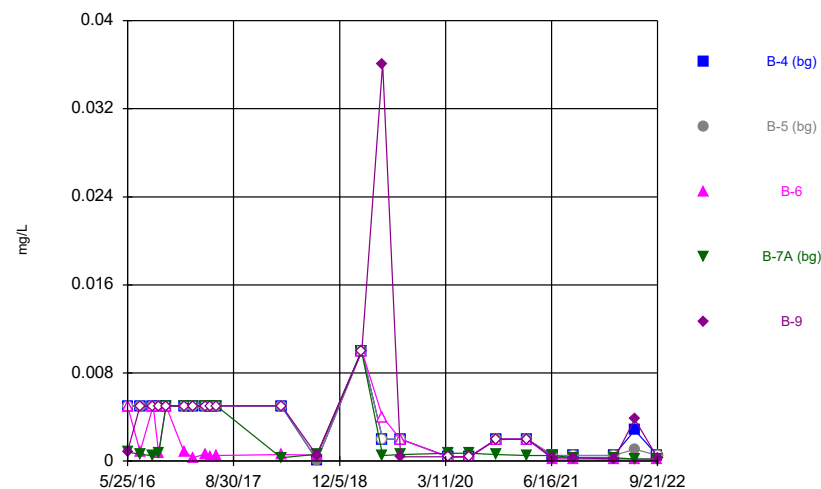
Constituent: Mercury, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



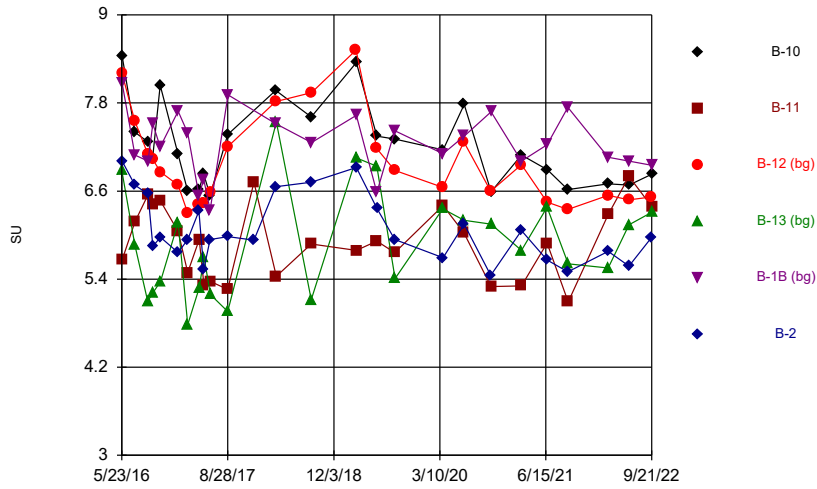
Constituent: Molybdenum, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



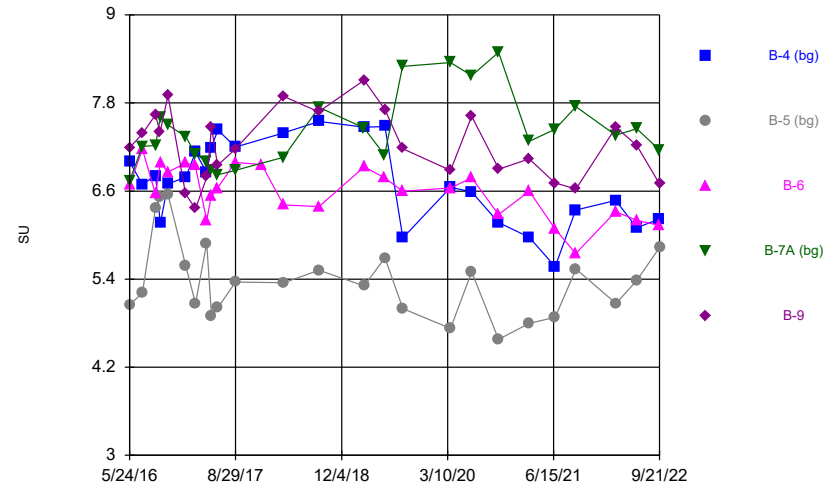
Constituent: Molybdenum, total Analysis Run 12/29/2022 11:23 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



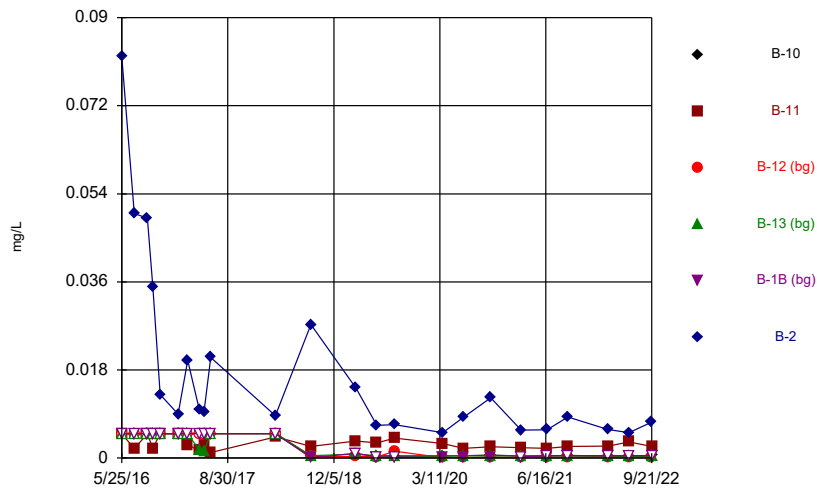
Constituent: pH, field Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



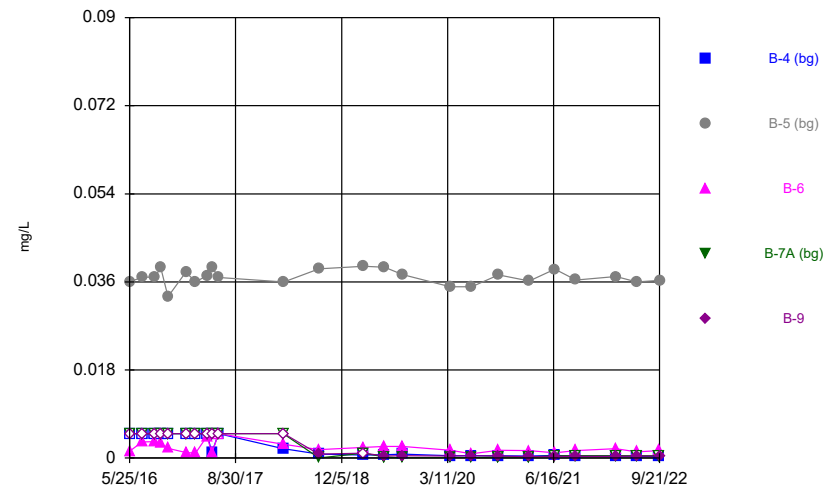
Constituent: pH, field Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



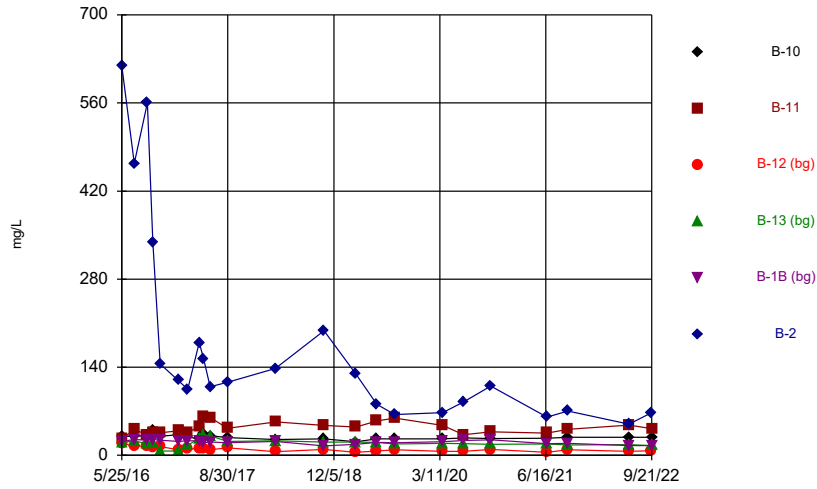
Constituent: Selenium, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



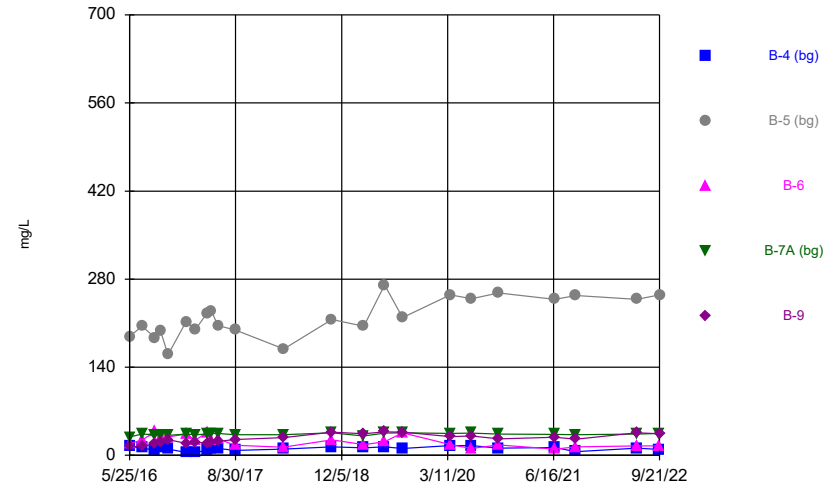
Constituent: Selenium, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



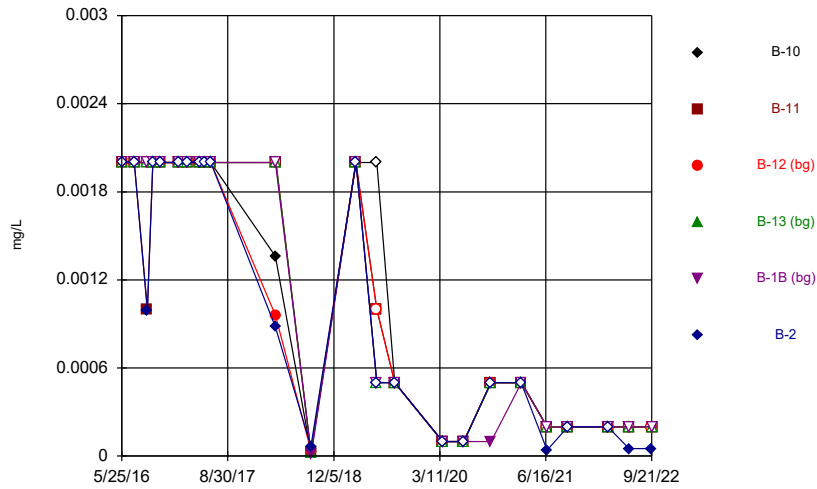
Constituent: Sulfate, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



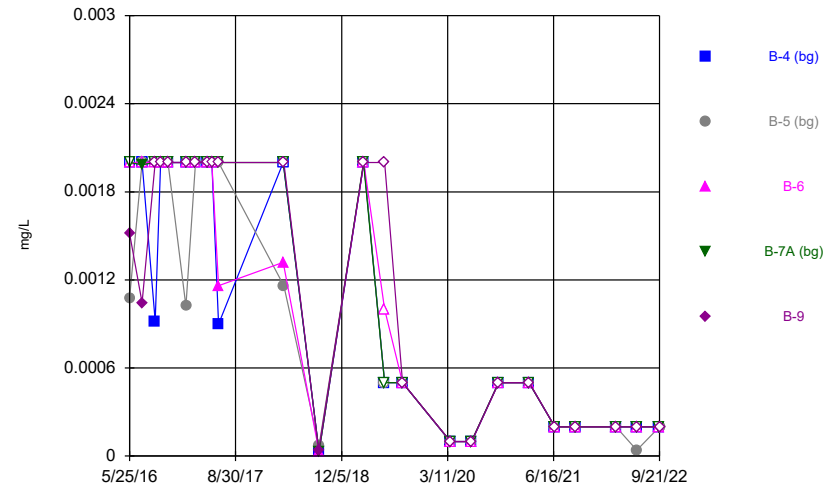
Constituent: Sulfate, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



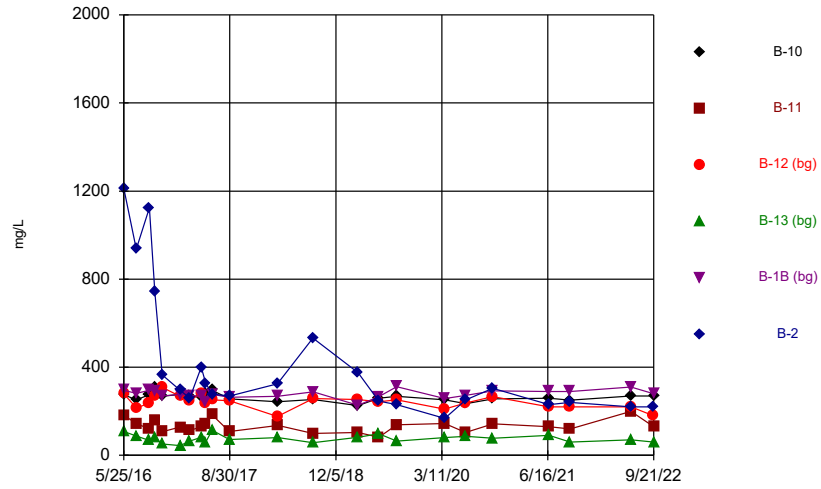
Constituent: Thallium, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



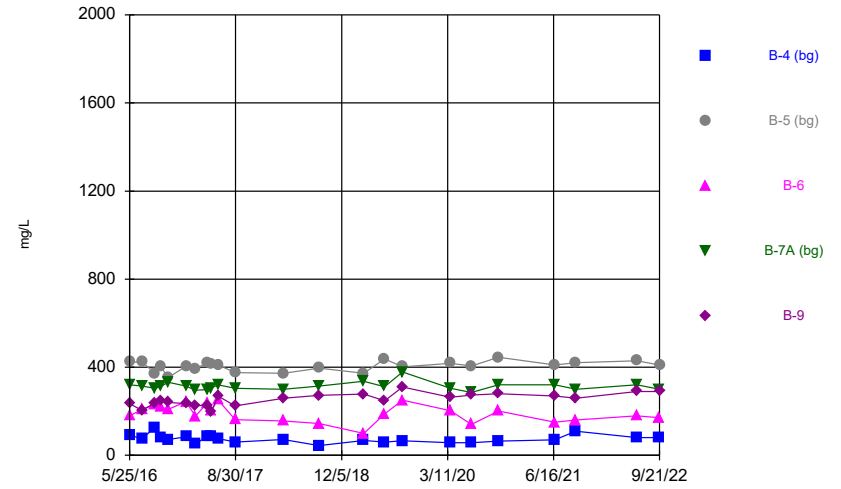
Constituent: Thallium, total Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

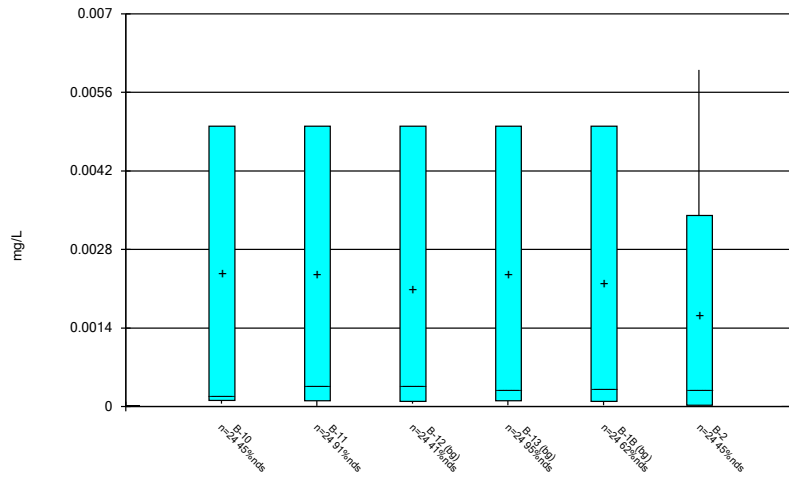
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/29/2022 11:23 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

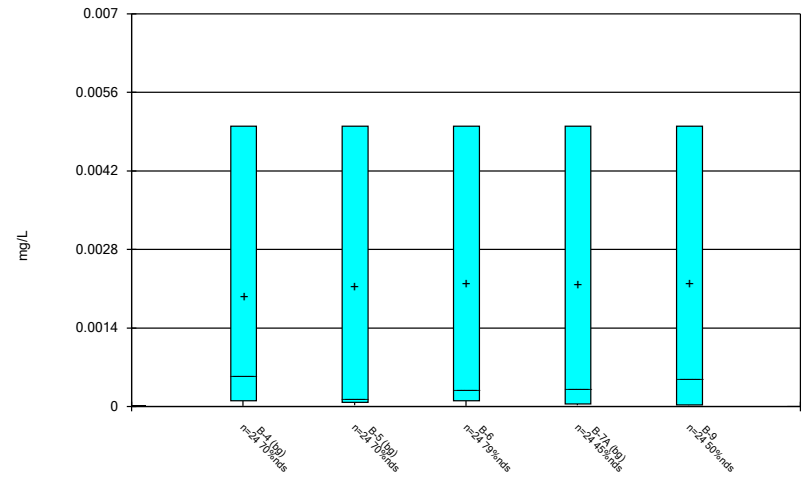
FIGURE B.

Box & Whiskers Plot



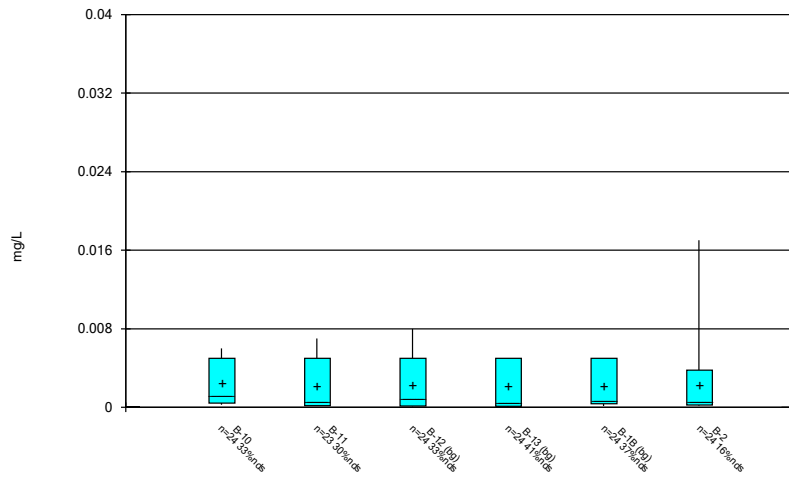
Constituent: Antimony, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



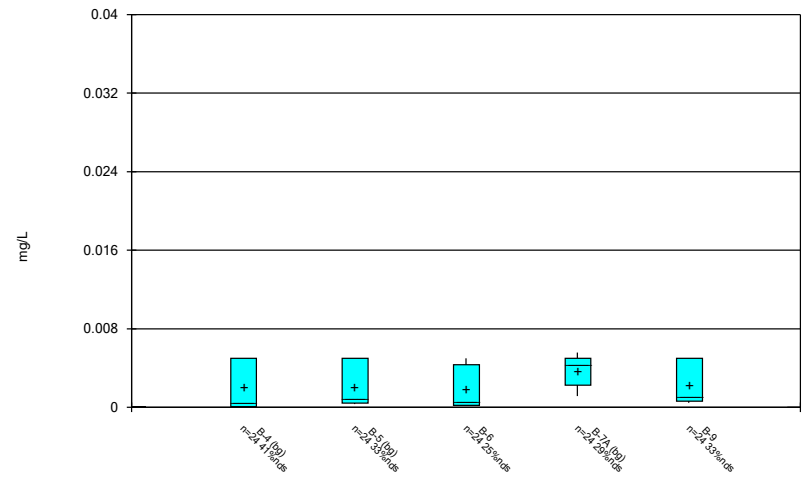
Constituent: Antimony, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

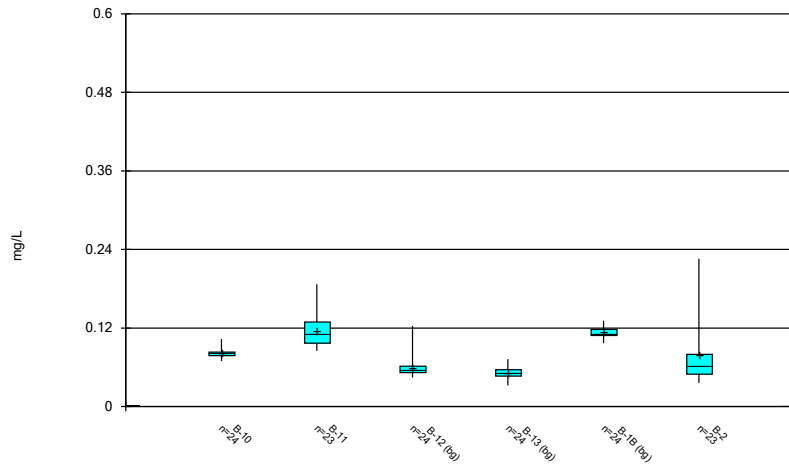
Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

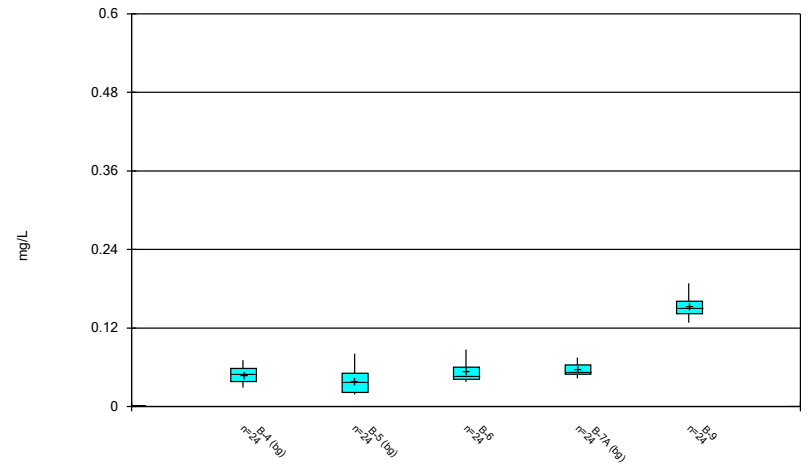


Box & Whiskers Plot



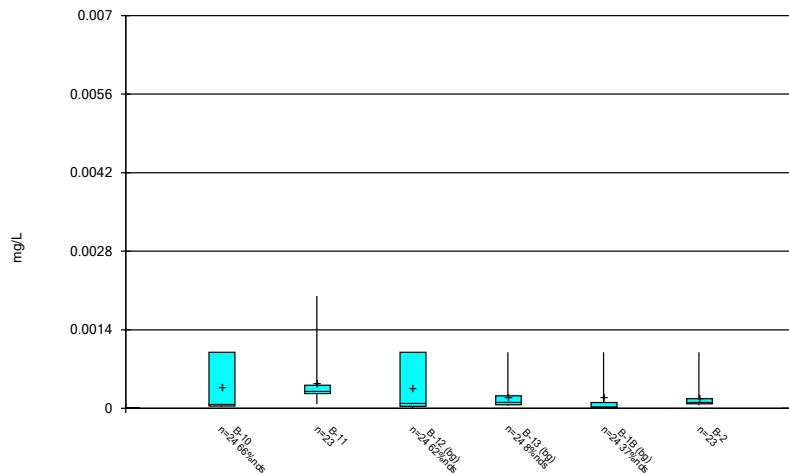
Constituent: Barium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



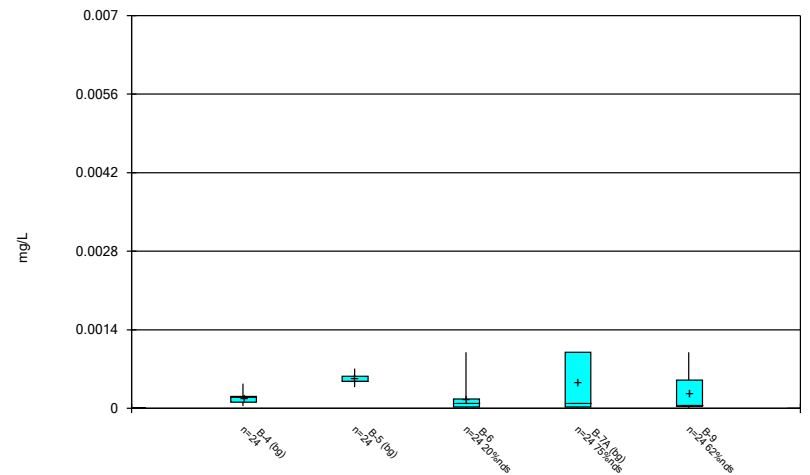
Constituent: Barium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



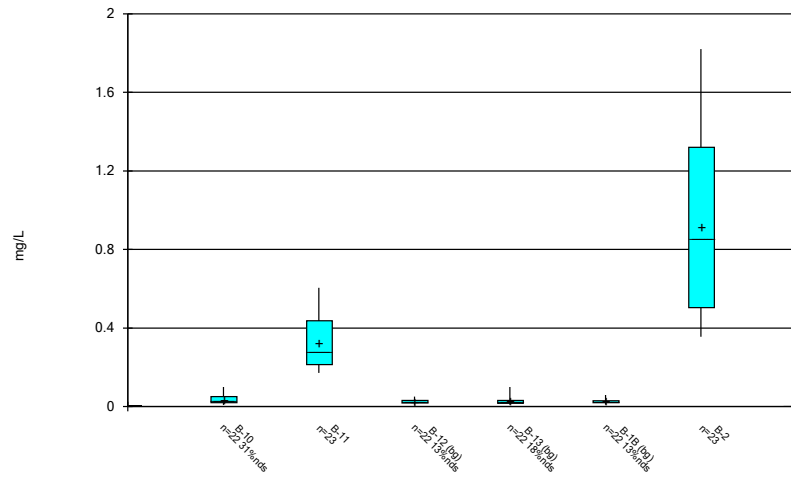
Constituent: Beryllium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



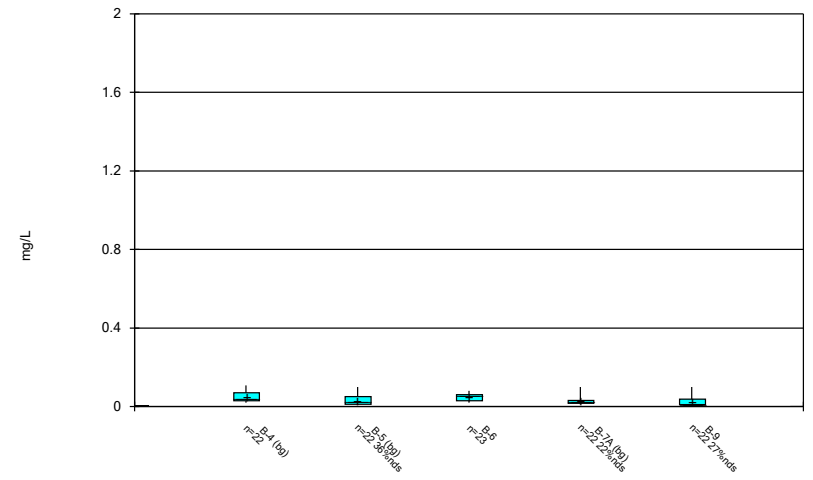
Constituent: Beryllium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



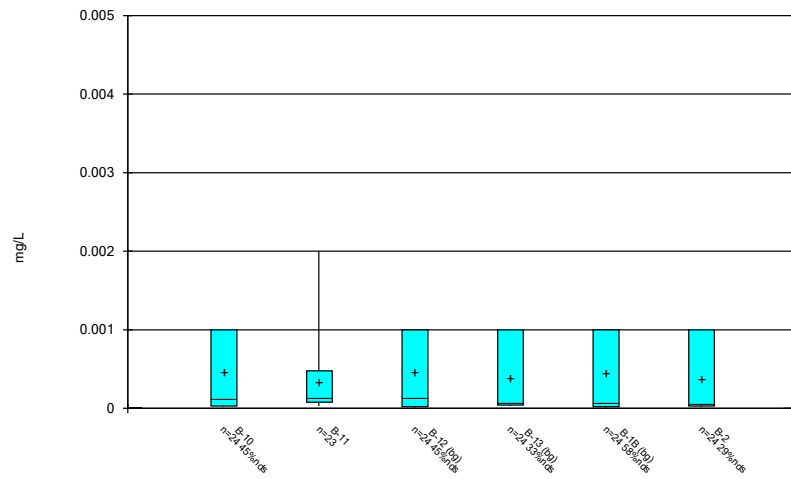
Constituent: Boron, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



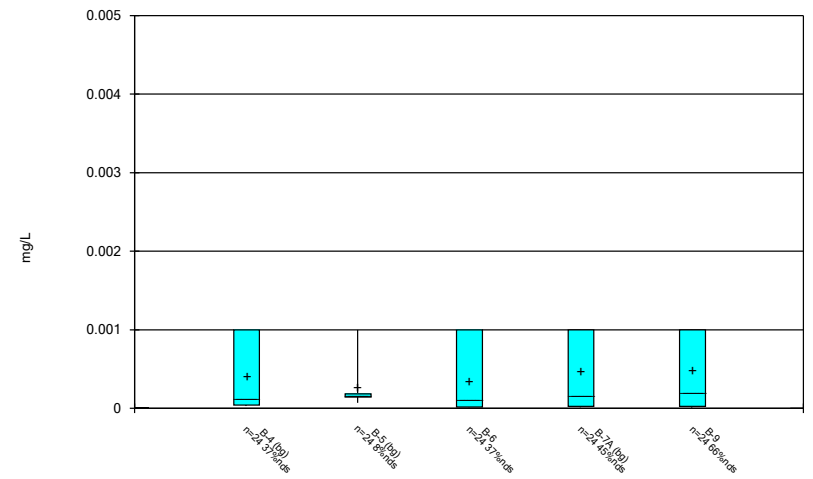
Constituent: Boron, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



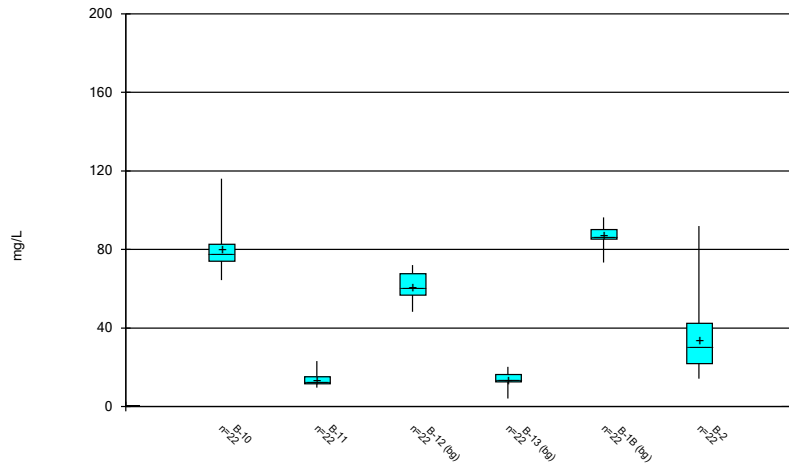
Constituent: Cadmium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



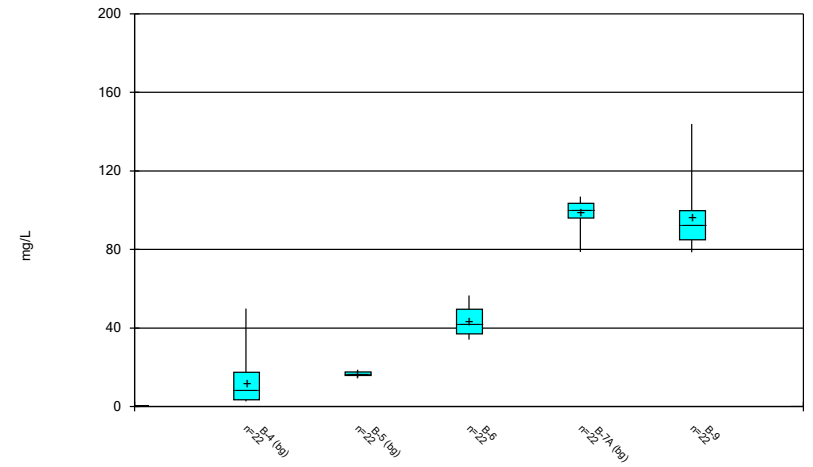
Constituent: Cadmium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



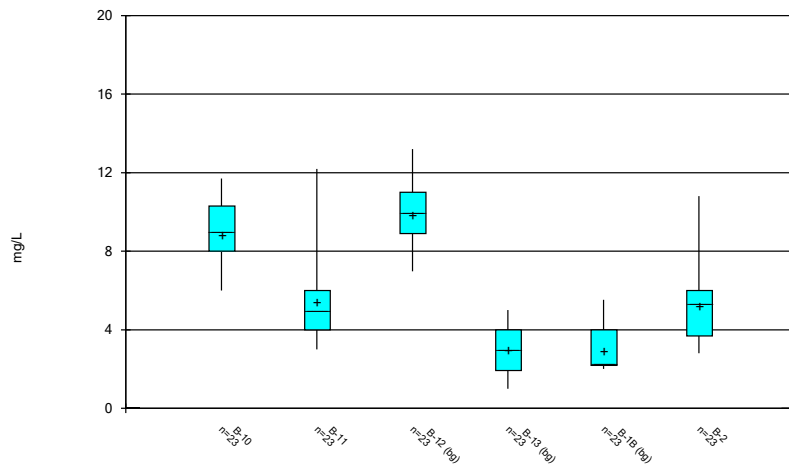
Constituent: Calcium, total Analysis Run 12/29/2022 11:24 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



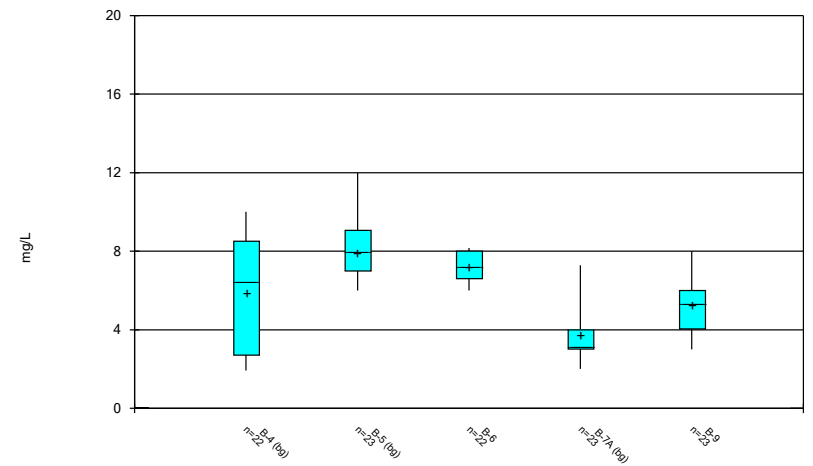
Constituent: Calcium, total Analysis Run 12/29/2022 11:24 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



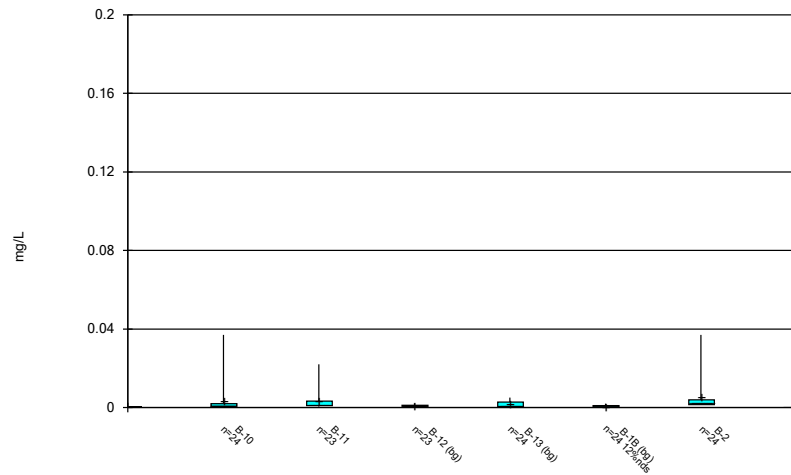
Constituent: Chloride, total Analysis Run 12/29/2022 11:24 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



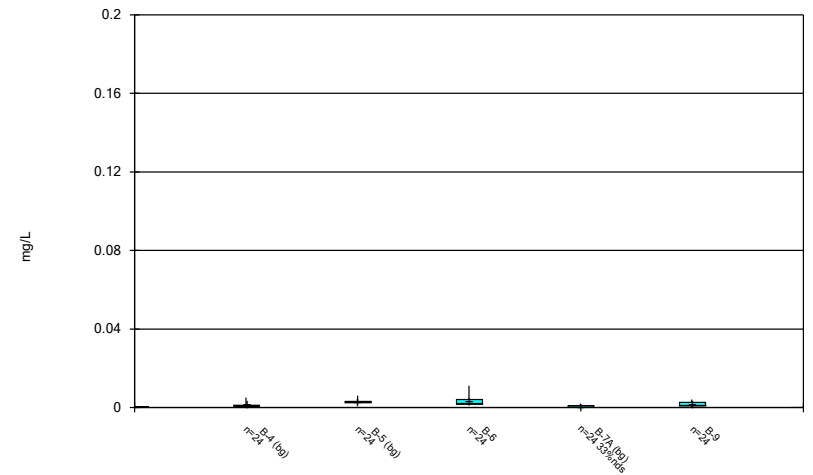
Constituent: Chloride, total Analysis Run 12/29/2022 11:24 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



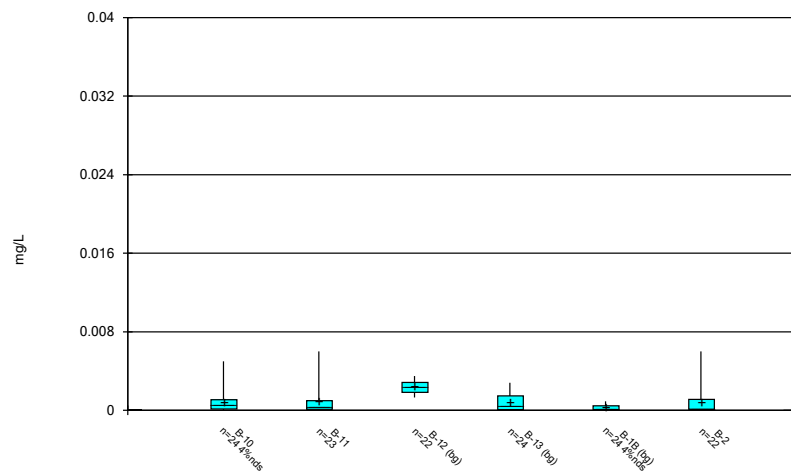
Constituent: Chromium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



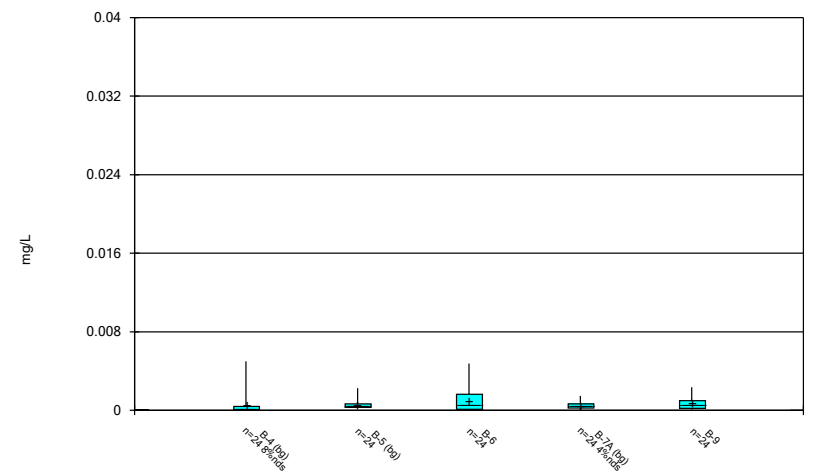
Constituent: Chromium, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



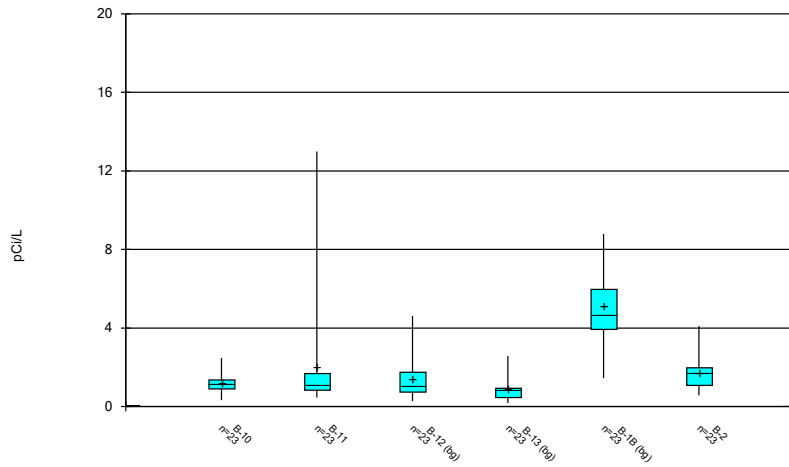
Constituent: Cobalt, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



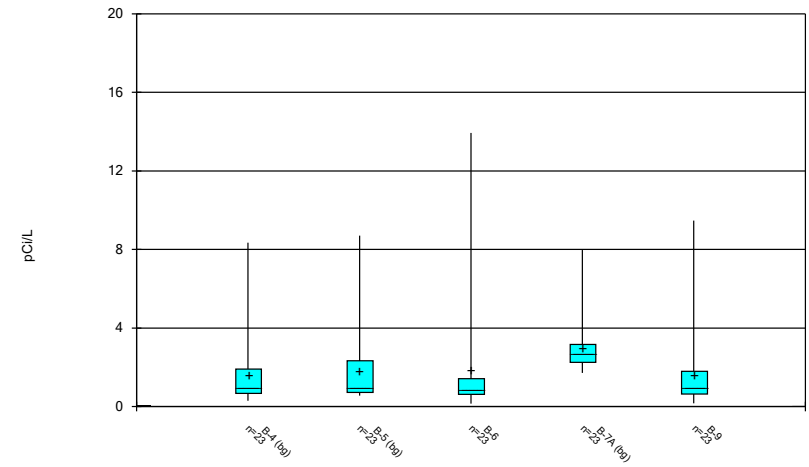
Constituent: Cobalt, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



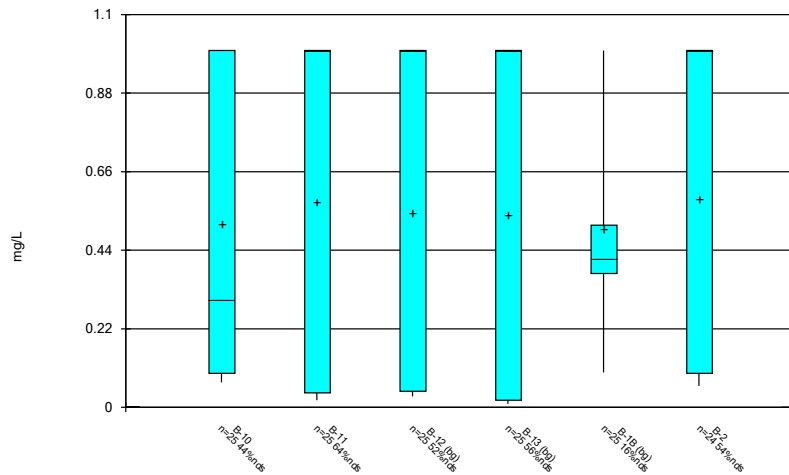
Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



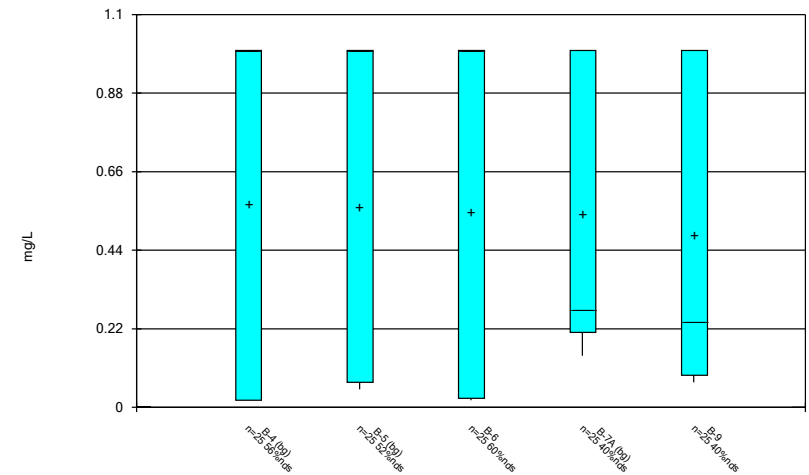
Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



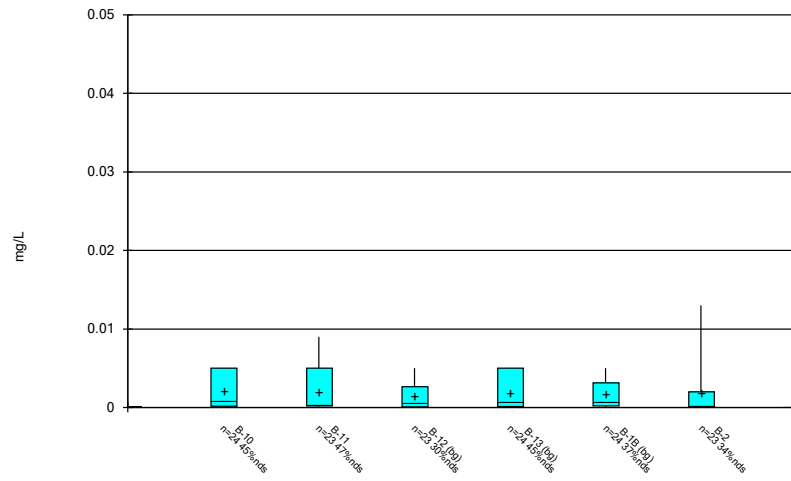
Constituent: Fluoride, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



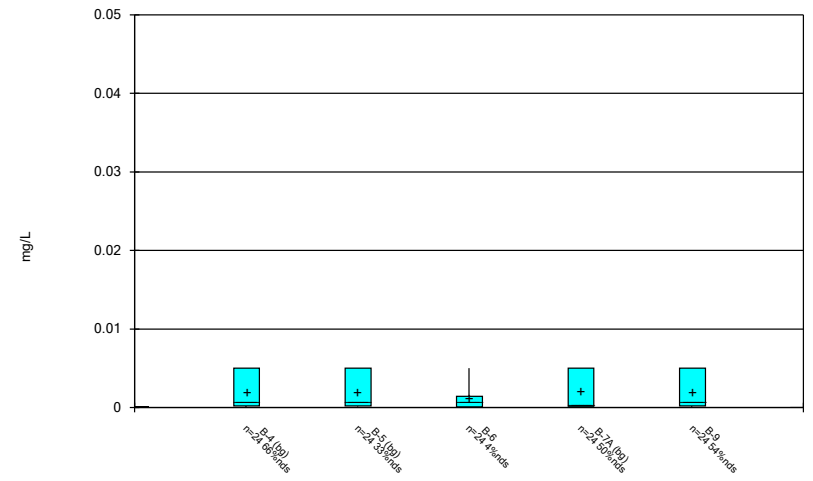
Constituent: Fluoride, total Analysis Run 12/29/2022 11:24 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



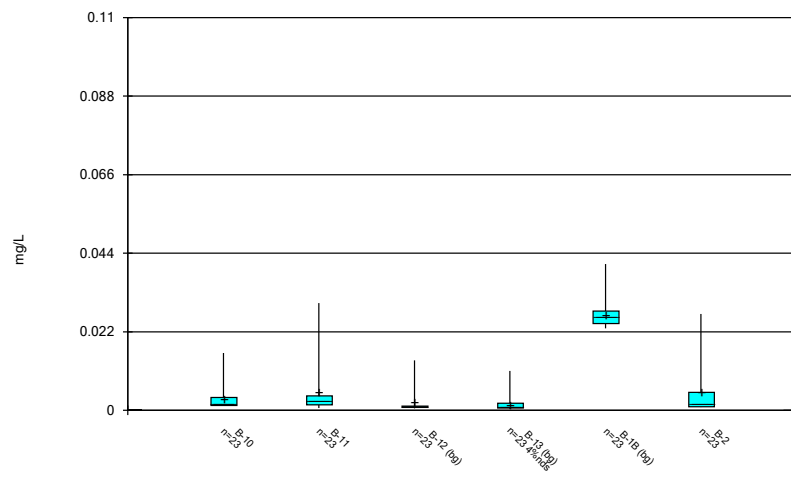
Constituent: Lead, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



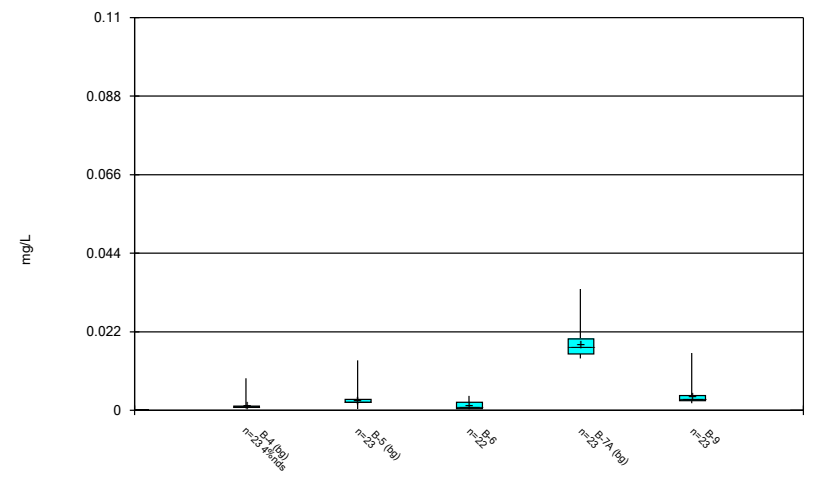
Constituent: Lead, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



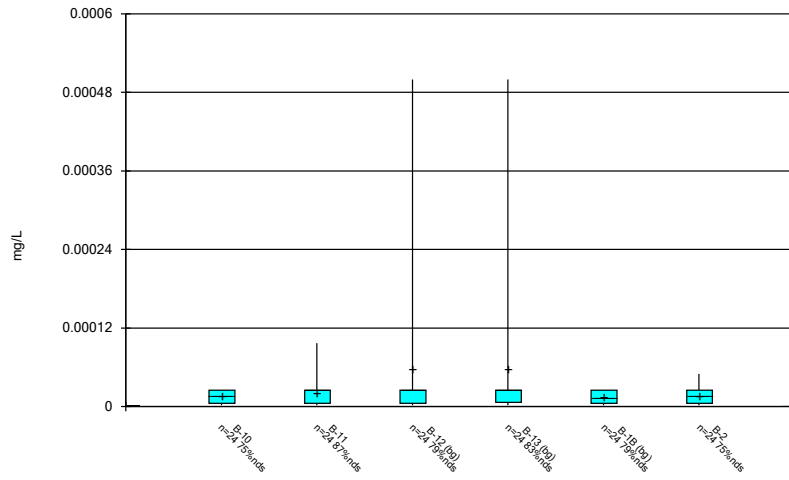
Constituent: Lithium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



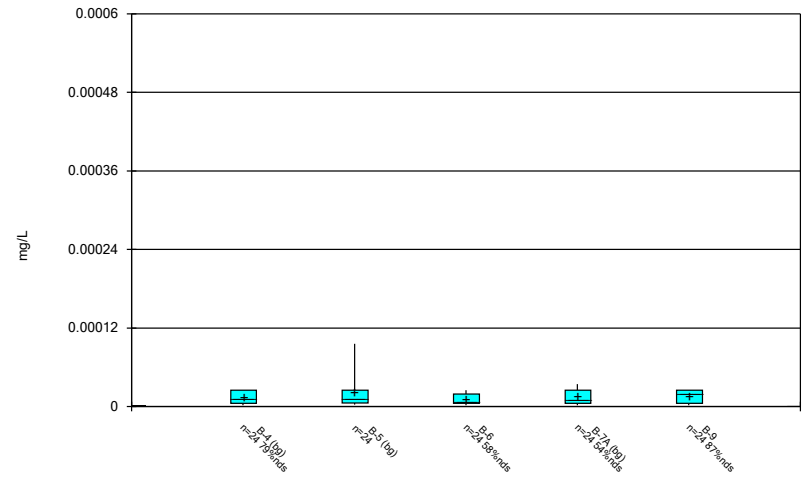
Constituent: Lithium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



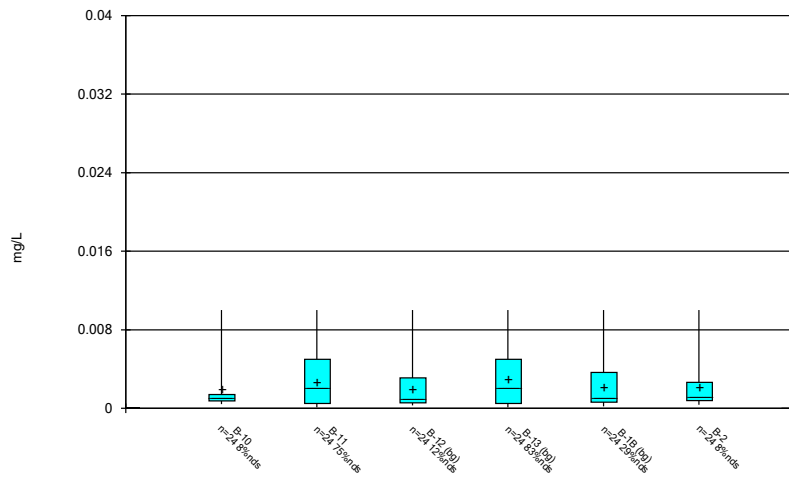
Constituent: Mercury, total Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



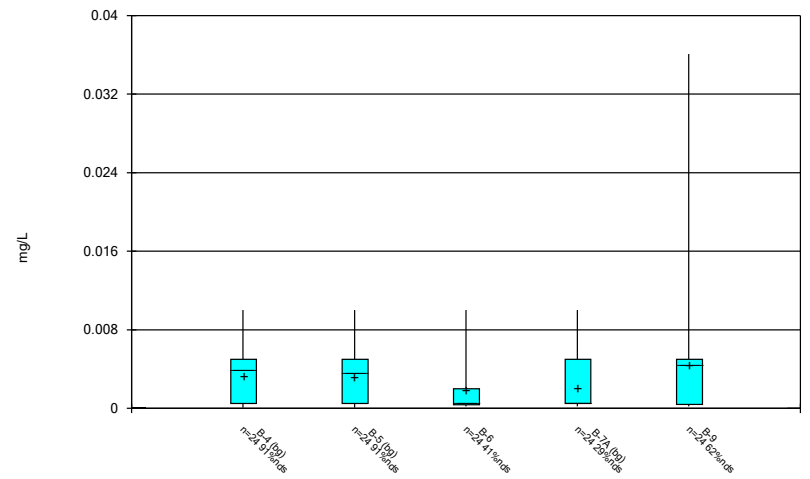
Constituent: Mercury, total Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



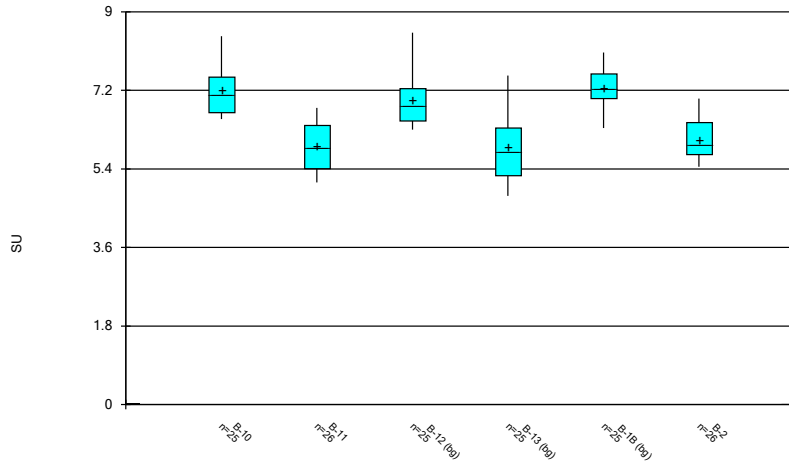
Constituent: Molybdenum, total Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



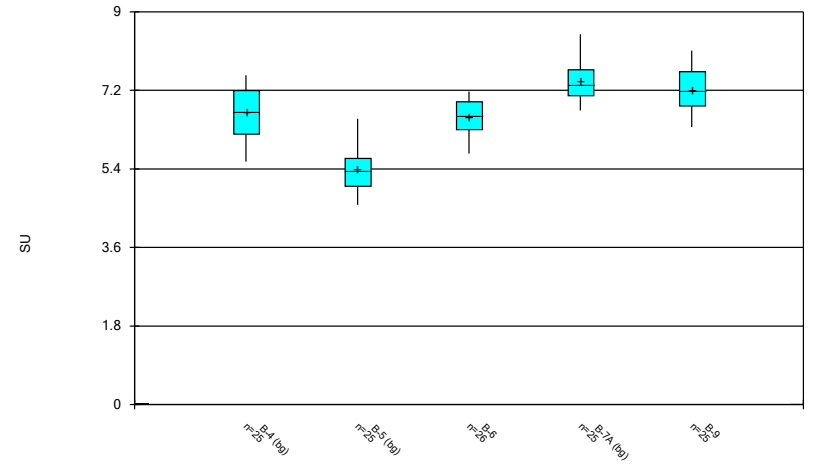
Constituent: Molybdenum, total Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



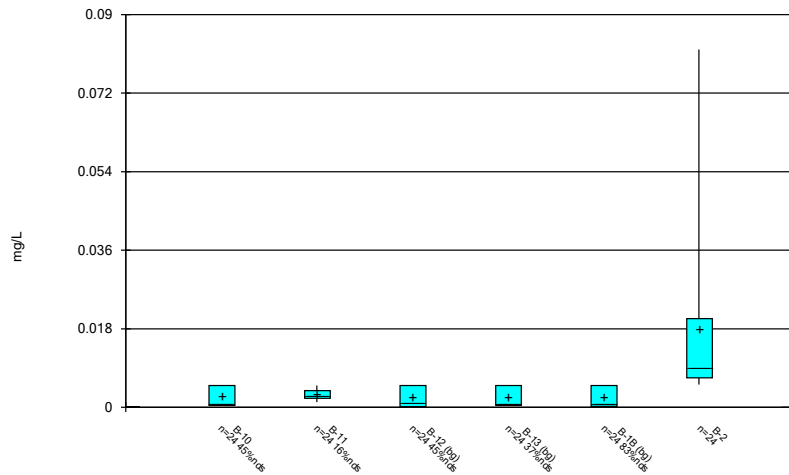
Constituent: pH, field Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



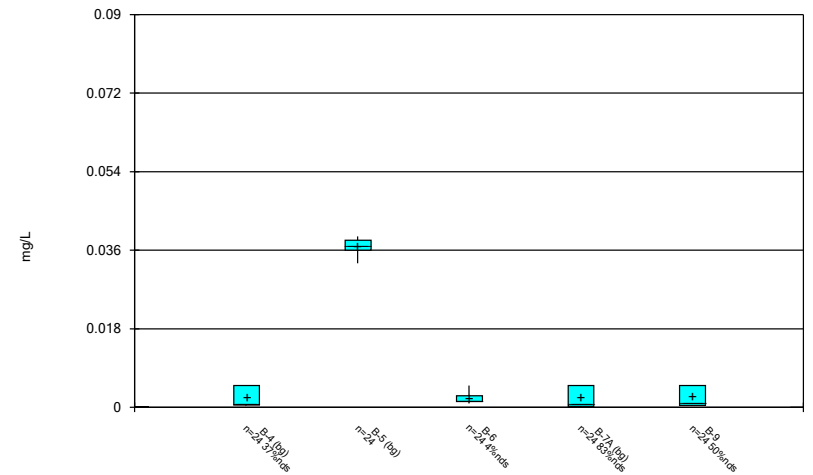
Constituent: pH, field Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

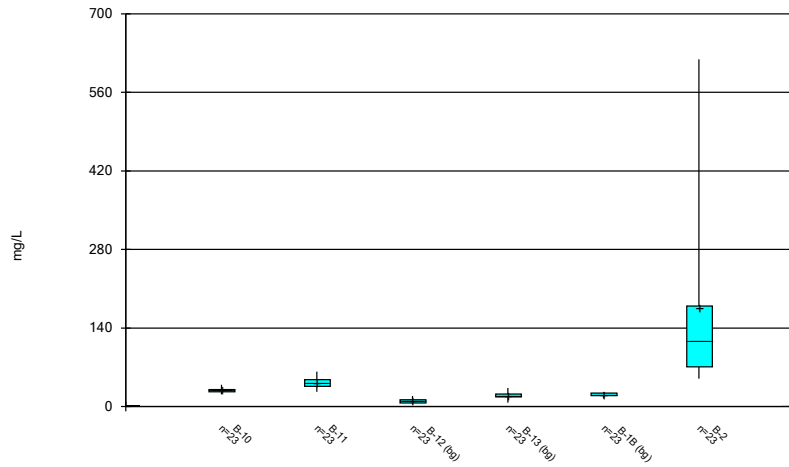
Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

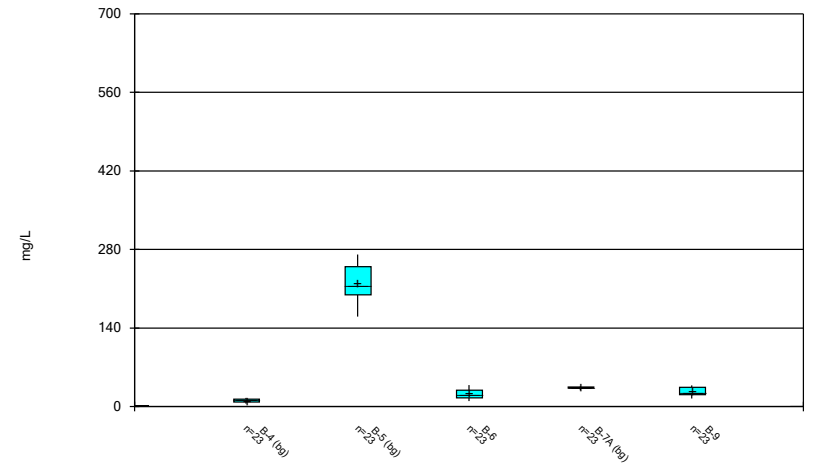


Box & Whiskers Plot



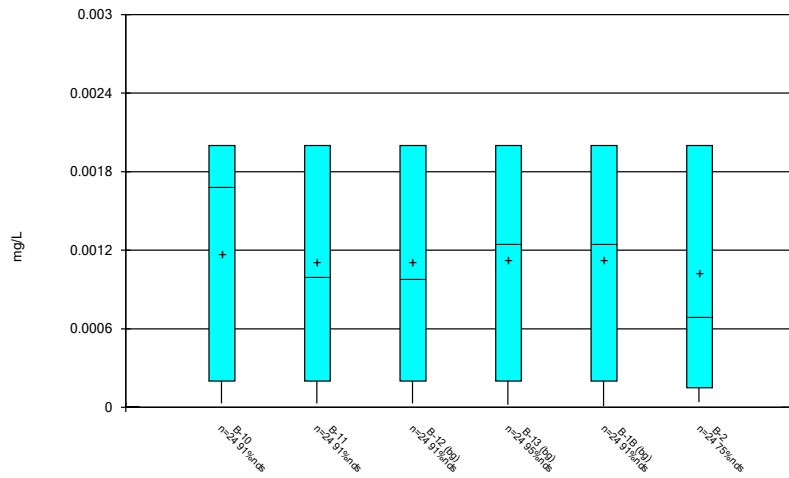
Constituent: Sulfate, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



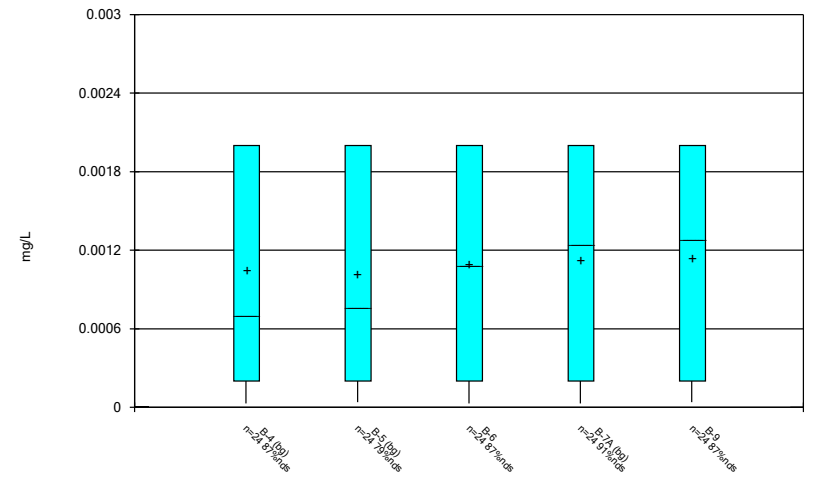
Constituent: Sulfate, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



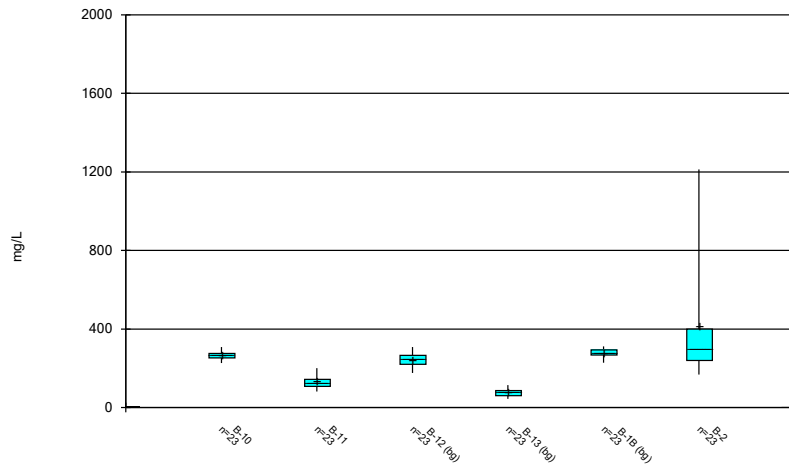
Constituent: Thallium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



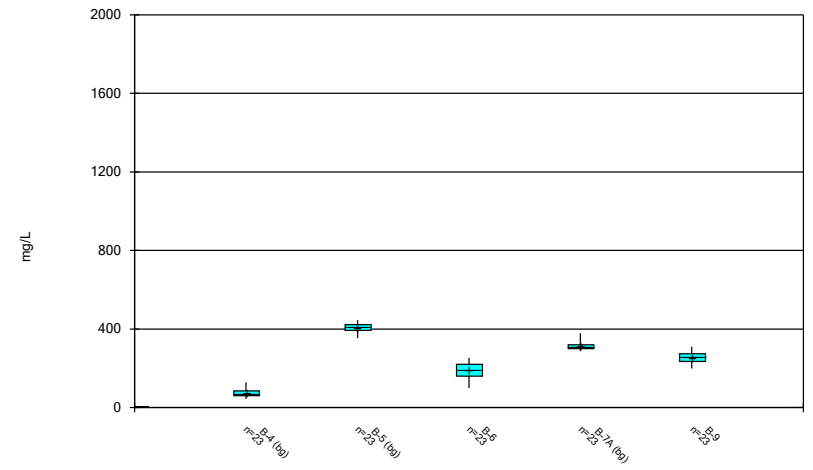
Constituent: Thallium, total Analysis Run 12/29/2022 11:25 AM  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/29/2022 11:25 AM  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

FIGURE C.



# Tukey's Outlier Test - Significant Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/29/2022, 10:02 AM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Barium, total (mg/L)	B-12,B-13,B-1B,B-....	Yes	0.123,0.123,0.123,0.112,0.112,0.112,0.112,0.112,0	NP	NaN	144	0.06149	0.02711	x^6	ChiSquared
Chromium, total (mg/L)	B-12,B-13,B-1B,B-....	Yes	0.022,0.004,0.004,0.003,0.003,0.003,0.003,0	NP	NaN	144	0.001509	0.002108	x^4	ChiSquared
Cobalt, total (mg/L)	B-12,B-13,B-1B,B-....	Yes	0.003362,0.002846,0.002534,0.002315,0.023,0.00195	NP	NaN	144	0.001043	0.002243	x^4	ChiSquared
Combined Radium 226 + 228 (pCi/L)	B-12,B-13,B-1B,B-....	Yes	4.62,8.375,8.79,4.63,5.15,4.49,6.51,5.96,4.73,5.3	NP	NaN	138	2.277	2.008	x^5	ChiSquared
Lithium, total (mg/L)	B-12,B-13,B-1B,B-....	Yes	0.1,0.1,0.028,0.028,0.028,0.041,0.027,0.034,0.027	NP	NaN	144	0.01271	0.02095	x^4	ChiSquared
Selenium, total (mg/L)	B-12,B-13,B-1B,B-....	Yes	0.036,0.036,0.036,0.036,0.037,0.037,0.039,0.039,0	NP	NaN	144	0.008152	0.01312	x^2	ChiSquared

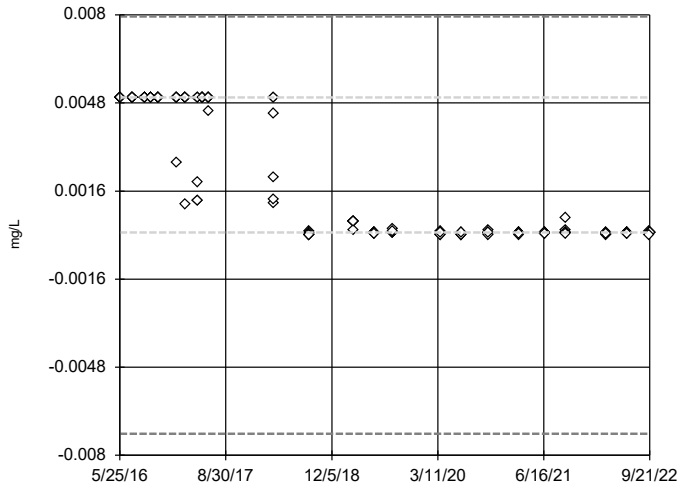
# Tukey's Outlier Test - All Results

Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF    Printed 12/29/2022, 10:02 AM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.002155	0.002358	unknown	ChiSquared
Arsenic, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.002434	0.002255	unknown	ChiSquared
<b>Barium, total (mg/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>0.123,0.123,0.123,0.112,0.112,0.112,0.112,0.112,0</b>	<b>NP</b>	<b>NaN</b>	<b>144</b>	<b>0.06149</b>	<b>0.02711</b>	<b>x^6</b>	<b>ChiSquared</b>
Beryllium, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.0003237	0.000346	unknown	ChiSquared
Cadmium, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.0004084	0.0004455	unknown	ChiSquared
<b>Chromium, total (mg/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>0.022,0.004,0.004,0.003,0.003,0.003,0.003,0.003,0</b>	<b>NP</b>	<b>NaN</b>	<b>144</b>	<b>0.001509</b>	<b>0.002108</b>	<b>x^4</b>	<b>ChiSquared</b>
<b>Cobalt, total (mg/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>0.003362,0.002846,0.002534,0.002315,0.023,0.00195</b>	<b>NP</b>	<b>NaN</b>	<b>144</b>	<b>0.001043</b>	<b>0.002243</b>	<b>x^4</b>	<b>ChiSquared</b>
<b>Combined Radium 226 + 228 (pCi/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>4.62,8.375,8.79,4.63,5.15,4.49,6.51,5.96,4.73,5.3</b>	<b>NP</b>	<b>NaN</b>	<b>138</b>	<b>2.277</b>	<b>2.008</b>	<b>x^5</b>	<b>ChiSquared</b>
Fluoride, total (mg/L)	B-12,B-13,B-1B,B-...	No	n/a	NP	NaN	150	0.5429	0.43	x^6	ChiSquared
Lead, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.001911	0.002384	unknown	ChiSquared
<b>Lithium, total (mg/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>0.1,0.1,0.028,0.028,0.028,0.041,0.027,0.034,0.027</b>	<b>NP</b>	<b>NaN</b>	<b>144</b>	<b>0.01271</b>	<b>0.02095</b>	<b>x^4</b>	<b>ChiSquared</b>
Mercury, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.00002992	0.0000809	unknown	ChiSquared
Molybdenum, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.002605	0.002507	unknown	ChiSquared
<b>Selenium, total (mg/L)</b>	<b>B-12,B-13,B-1B,B-...</b>	<b>Yes</b>	<b>0.036,0.036,0.036,0.036,0.037,0.037,0.039,0.039,0</b>	<b>NP</b>	<b>NaN</b>	<b>144</b>	<b>0.008152</b>	<b>0.01312</b>	<b>x^2</b>	<b>ChiSquared</b>
Thallium, total (mg/L)	B-12,B-13,B-1B,B-...	n/a	n/a	NP	NaN	144	0.001093	0.0008606	unknown	ChiSquared

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

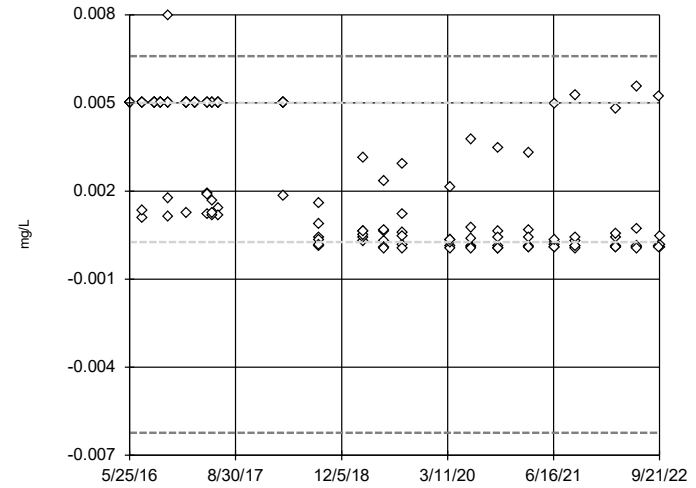


n = 144  
 No outliers found. Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Antimony, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

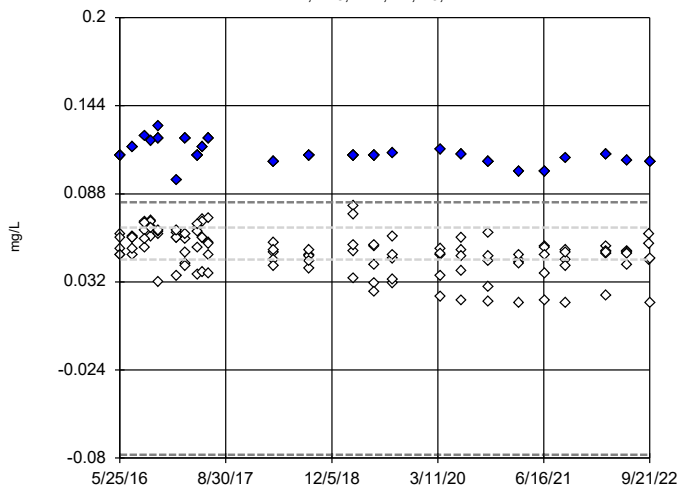


n = 144  
 No outliers found. Tukey's method selected by user.  
 Data were x<sup>5</sup> transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Arsenic, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

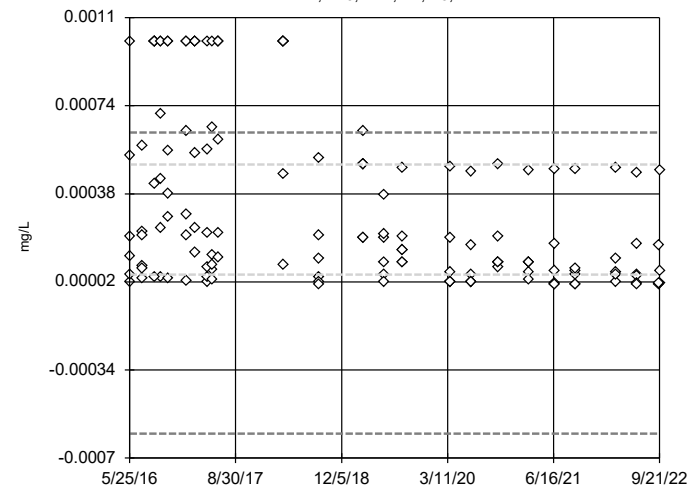


n = 144  
 Outliers are drawn as solid. Tukey's method selected by user.  
 Data were x<sup>6</sup> transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0827, low cutoff = -0.07786, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

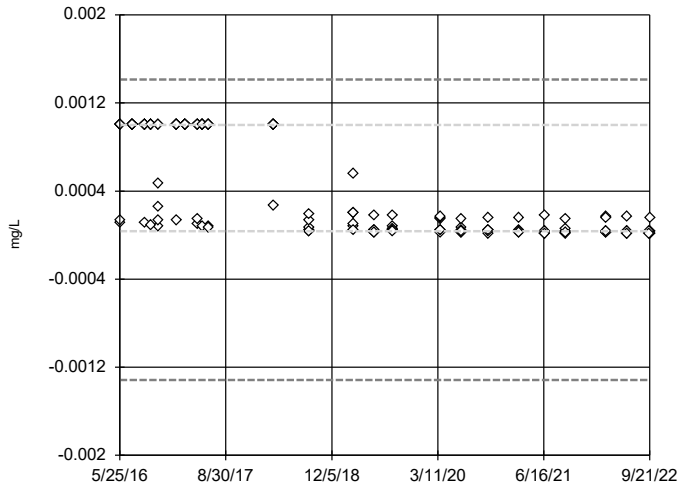


n = 144  
 No outliers found. Tukey's method selected by user.  
 Data were x<sup>6</sup> transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Beryllium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

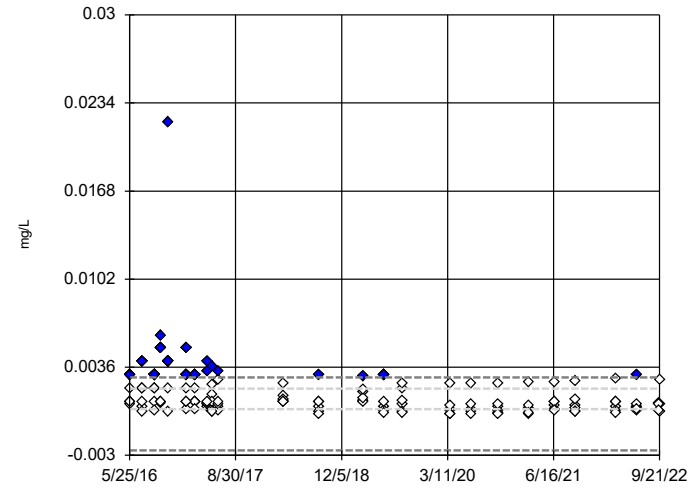


n = 144  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*4 transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Cadmium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

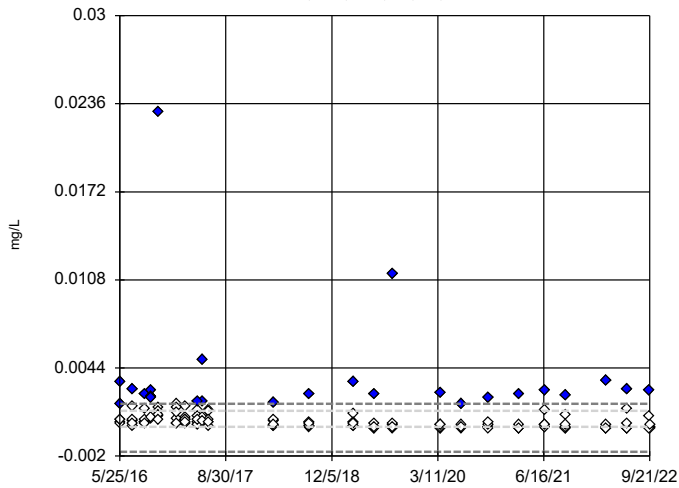


n = 144  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were x\*4 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.002827, low cutoff = -0.00263, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

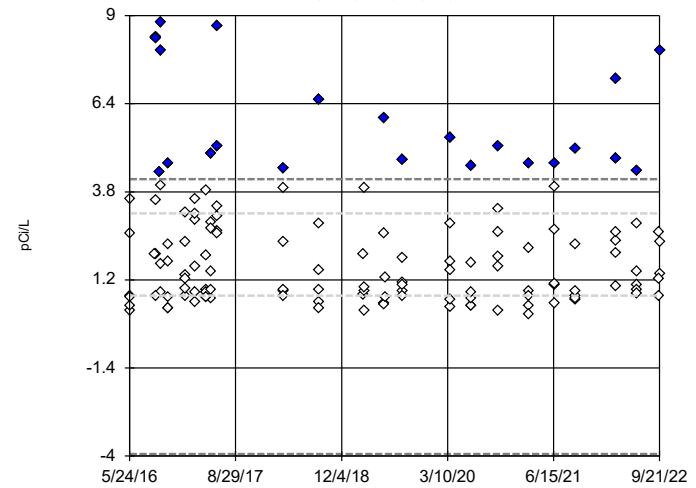


n = 144  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were x\*4 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.001811, low cutoff = -0.001685, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A



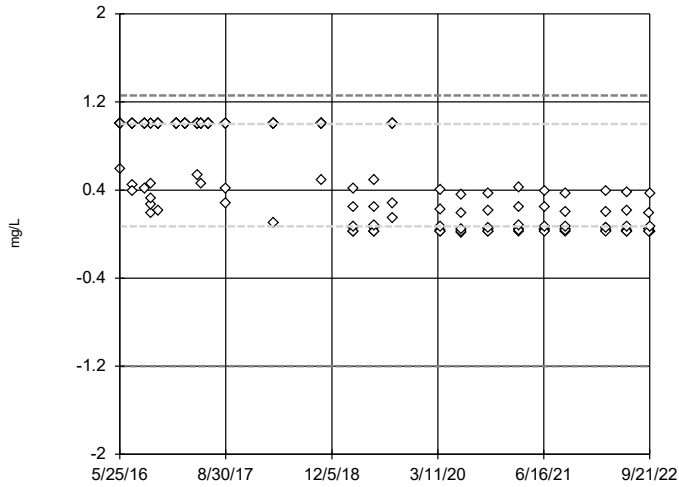
n = 138  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were x\*5 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 4.177, low cutoff = -3.943, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outlier  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

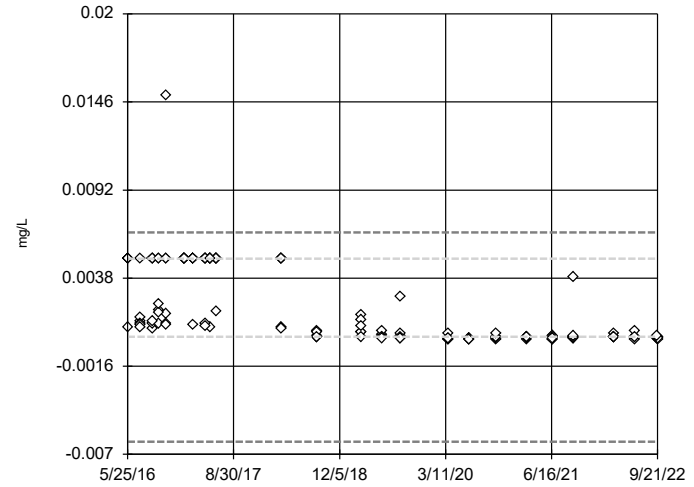


n = 150  
 No outliers found.  
 Tukey's method selected by user.  
 Data were  $x^6$  transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.26, low cutoff = -1.201, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

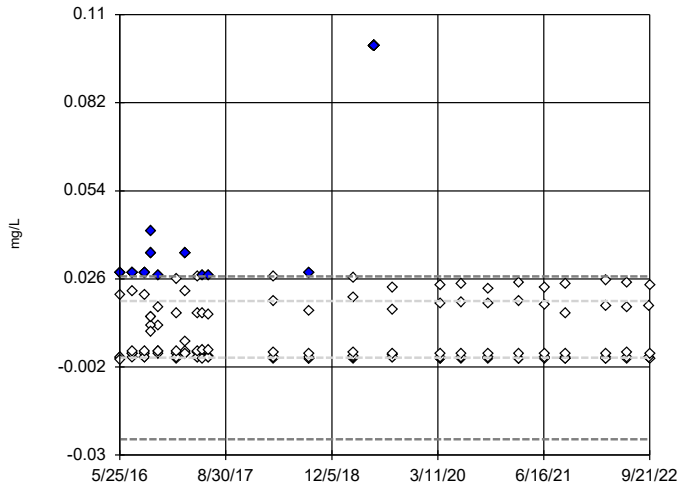


n = 144  
 No outliers found.  
 Tukey's method selected by user.  
 Data were  $x^5$  transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Lead, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

B-12,B-13,B-1B,B-4,B-5,B-7A

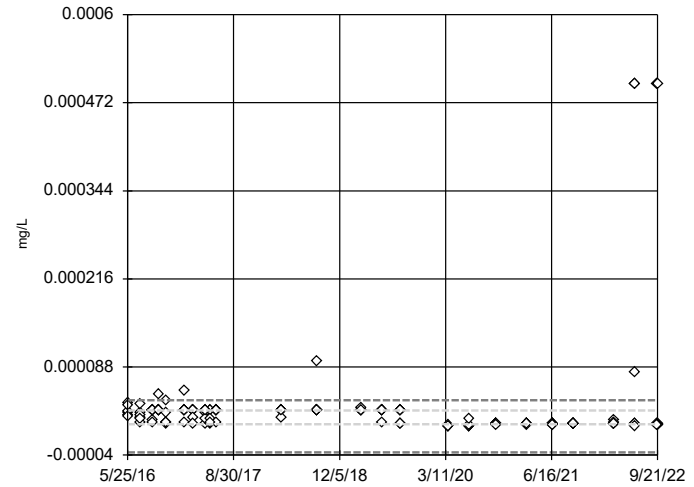


n = 144  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were  $x^4$  transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0268, low cutoff = -0.02494, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tukey's Outlier Screening, Pooled Background

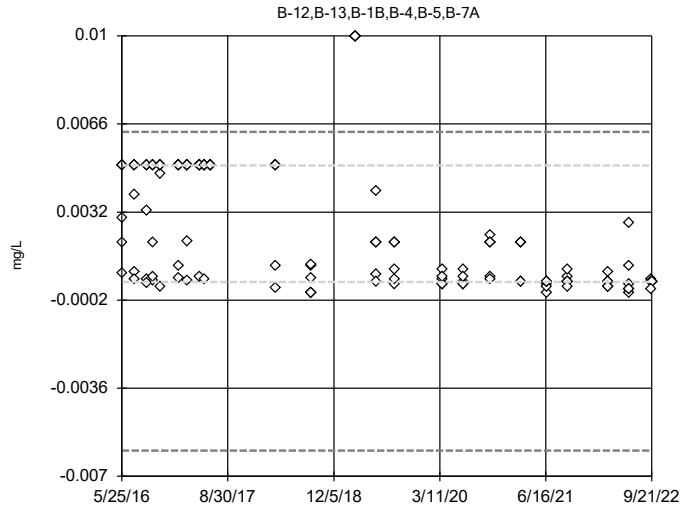
B-12,B-13,B-1B,B-4,B-5,B-7A



n = 144  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Mercury, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

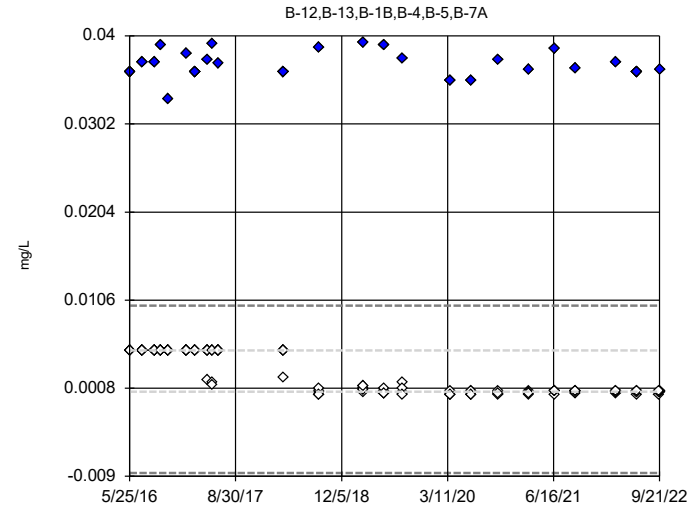
Tukey's Outlier Screening, Pooled Background



n = 144  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Molybdenum, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

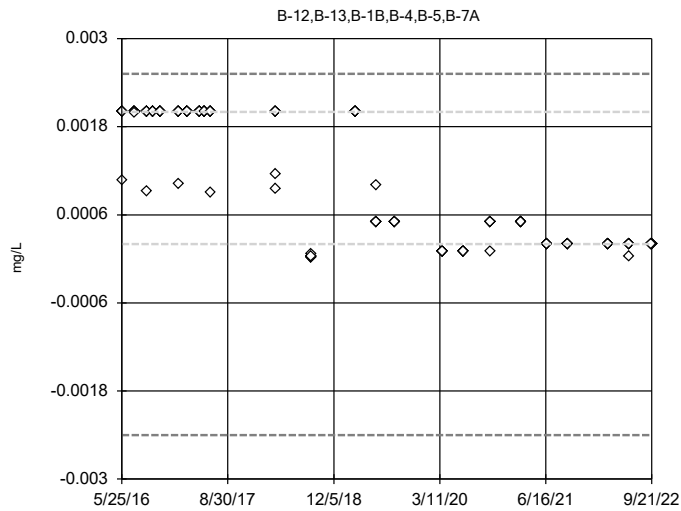
Tukey's Outlier Screening, Pooled Background



n = 144  
 Outliers are drawn as solid.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.009976, low cutoff = -0.008623, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Tukey's Outlier Screening, Pooled Background



n = 144  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Thallium, total Analysis Run 12/29/2022 10:01 AM View: Appendix IV - Outliers  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

FIGURE D.

# Intrawell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:40 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	B-10	116	n/a	n/a	1 future	n/a	19	n/a	n/a	n/a	0	n/a	n/a	0.004832	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	B-11	18.12	n/a	n/a	1 future	n/a	19	13.3	2.315	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-12	74.42	n/a	n/a	1 future	n/a	19	62.6	5.681	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-13	22.85	n/a	n/a	1 future	n/a	19	13.65	4.419	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-1B	95.4	n/a	n/a	1 future	n/a	19	88.34	3.394	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-2	53.56	n/a	n/a	1 future	n/a	16	28.35	11.73	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-4	9.552	n/a	n/a	1 future	n/a	10	4.545	2.021	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-5	18.89	n/a	n/a	1 future	n/a	19	16.89	0.9571	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-6	58.78	n/a	n/a	1 future	n/a	19	43.94	7.134	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-7A	109	n/a	n/a	1 future	n/a	19	100.4	4.131	0	None	No	0.001504	Param Intra 1 of 2	
Calcium, total (mg/L)	B-9	134.2	n/a	n/a	1 future	n/a	19	9.908	0.8056	0	None	sqrt(x)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-10	11.72	n/a	n/a	1 future	n/a	20	8.557	1.536	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-11	7.536	n/a	n/a	1 future	n/a	20	4.834	1.313	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-12	13.13	n/a	n/a	1 future	n/a	20	10.09	1.477	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-13	5.486	n/a	n/a	1 future	n/a	20	3.106	1.157	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-1B	5.417	n/a	n/a	1 future	n/a	20	1.426	0.1602	0	None	x^(1/3)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-2	9.19	n/a	n/a	1 future	n/a	20	5.54	1.774	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-4	6.351	n/a	n/a	1 future	n/a	8	3.136	1.173	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-5	10.84	n/a	n/a	1 future	n/a	20	7.668	1.543	0	None	No	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-6	8.535	n/a	n/a	1 future	n/a	19	2958	1128	0	None	x^4	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-7A	6.354	n/a	n/a	1 future	n/a	20	1.935	0.2848	0	None	sqrt(x)	0.001504	Param Intra 1 of 2	
Chloride, total (mg/L)	B-9	8.073	n/a	n/a	1 future	n/a	20	5.348	1.324	0	None	No	0.001504	Param Intra 1 of 2	
Fluoride, total (mg/L)	B-10	1	n/a	n/a	1 future	n/a	21	n/a	n/a	52.38	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-11	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-12	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-13	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-1B	1	n/a	n/a	1 future	n/a	21	n/a	n/a	19.05	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	B-2	1	n/a	n/a	1 future	n/a	20	n/a	n/a	65	n/a	n/a	0.004291	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-4	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-5	1	n/a	n/a	1 future	n/a	21	n/a	n/a	61.9	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-6	1	n/a	n/a	1 future	n/a	21	n/a	n/a	66.67	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	B-7A	1	n/a	n/a	1 future	n/a	21	n/a	n/a	47.62	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	B-9	1	n/a	n/a	1 future	n/a	21	n/a	n/a	47.62	n/a	n/a	0.003999	NP Intra (normality) 1 of 2	
pH, field (SU)	B-10	8.453	6.152	n/a	1 future	n/a	21	7.302	0.5629	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-11	6.784	4.956	n/a	1 future	n/a	22	5.87	0.4502	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-12	8.345	5.812	n/a	1 future	n/a	21	7.079	0.6193	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-13	7.464	4.292	n/a	1 future	n/a	21	5.878	0.7758	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-1B	8.169	6.336	n/a	1 future	n/a	21	7.253	0.4483	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-2	7.055	5.226	n/a	1 future	n/a	22	6.14	0.4504	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-4	7.962	5.633	n/a	1 future	n/a	21	6.798	0.5694	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-5	6.537	4.213	n/a	1 future	n/a	21	5.375	0.5683	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-6	7.265	6.099	n/a	1 future	n/a	22	6.682	0.2871	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-7A	8.487	6.34	n/a	1 future	n/a	21	7.413	0.5252	0	None	No	0.000752	Param Intra 1 of 2	
pH, field (SU)	B-9	8.235	6.293	n/a	1 future	n/a	21	7.264	0.475	0	None	No	0.000752	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-10	36.74	n/a	n/a	1 future	n/a	20	28.73	3.894	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-11	64.25	n/a	n/a	1 future	n/a	20	43.51	10.08	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-12	17.45	n/a	n/a	1 future	n/a	20	9.894	3.673	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-13	32.91	n/a	n/a	1 future	n/a	20	20.09	6.23	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-1B	27.06	n/a	n/a	1 future	n/a	20	21.64	2.638	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-2	202.1	n/a	n/a	1 future	n/a	16	116.3	39.92	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-4	17.07	n/a	n/a	1 future	n/a	20	10.92	2.986	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-5	243.3	n/a	n/a	1 future	n/a	14	200	19.34	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-6	40.97	n/a	n/a	1 future	n/a	20	23.33	8.572	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-7A	37.22	n/a	n/a	1 future	n/a	20	33.67	1.723	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	B-9	37.64	n/a	n/a	1 future	n/a	14	22.71	6.675	0	None	No	0.001504	Param Intra 1 of 2	

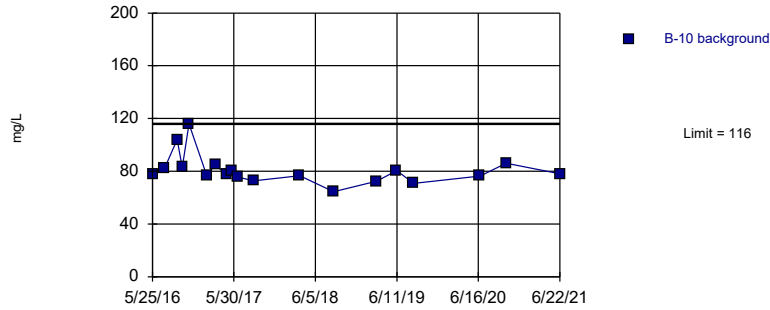
# Intrawell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:40 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Total Dissolved Solids [TDS] (mg/L)	B-10	303.7	n/a	n/a	1 future	n/a	20	264	19.3	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-11	183.8	n/a	n/a	1 future	n/a	20	129.7	26.3	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-12	307.9	n/a	n/a	1 future	n/a	20	248.2	29.06	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-13	114.1	n/a	n/a	1 future	n/a	20	77.4	17.82	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-1B	316.1	n/a	n/a	1 future	n/a	20	275.4	19.78	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-2	488.2	n/a	n/a	1 future	n/a	16	303.7	85.8	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-4	109.7	n/a	n/a	1 future	n/a	20	72.5	18.07	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-5	452.4	n/a	n/a	1 future	n/a	20	402.8	24.09	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-6	278.5	n/a	n/a	1 future	n/a	20	193	41.57	0	None	No	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-7A	354	n/a	n/a	1 future	n/a	20	5.749	0.05824	0	None	ln(x)	0.001504	Param Intra	1 of 2
Total Dissolved Solids [TDS] (mg/L)	B-9	307.2	n/a	n/a	1 future	n/a	20	249.8	27.9	0	None	No	0.001504	Param Intra	1 of 2

Prediction Limit

Intrawell Non-parametric, B-10

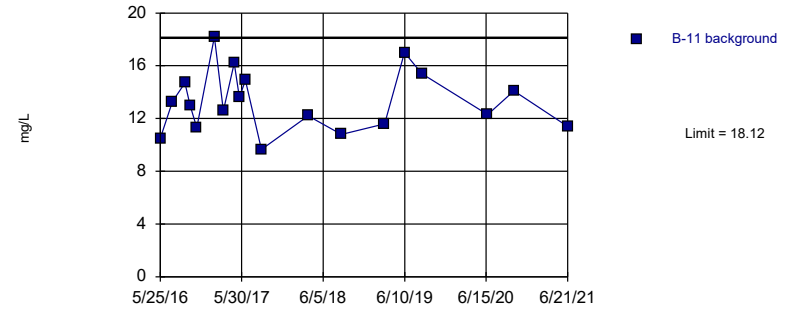


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 19 background values. Well-constituent pair annual alpha = 0.009641. Individual comparison alpha = 0.004832 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:35 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit

Intrawell Parametric, B-11

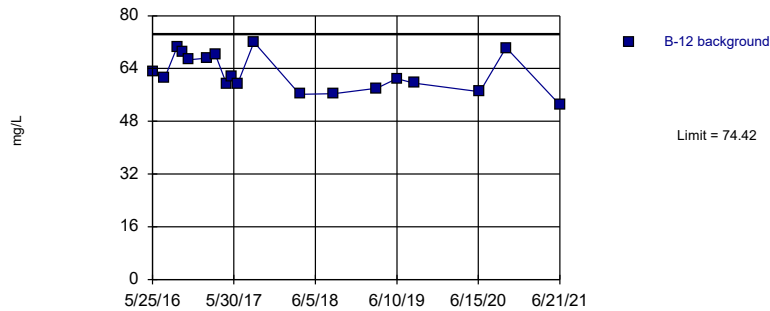


Background Data Summary: Mean=13.3, Std. Dev.=2.315, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9723, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:35 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit

Intrawell Parametric, B-12 (bg)

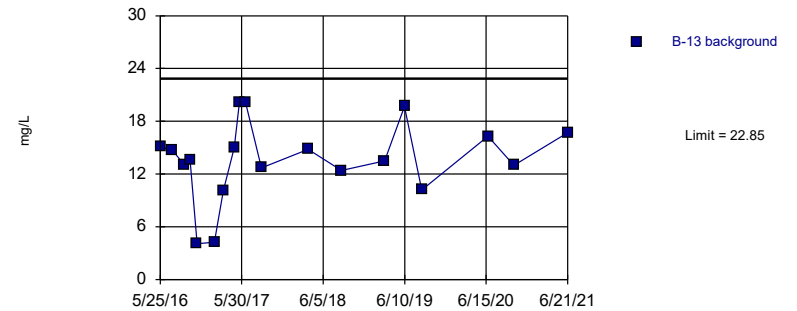


Background Data Summary: Mean=62.6, Std. Dev.=5.681, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9401, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:35 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit

Intrawell Parametric, B-13 (bg)

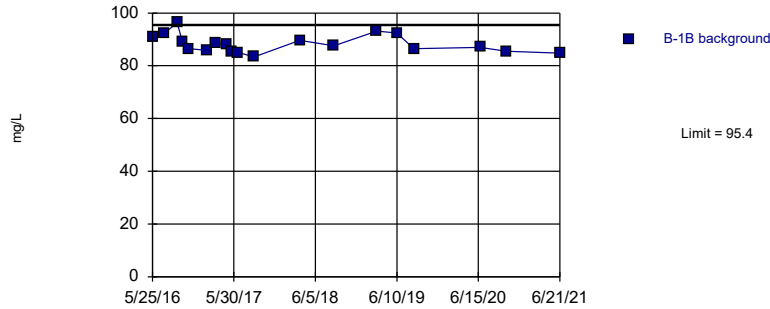


Background Data Summary: Mean=13.65, Std. Dev.=4.419, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9164, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

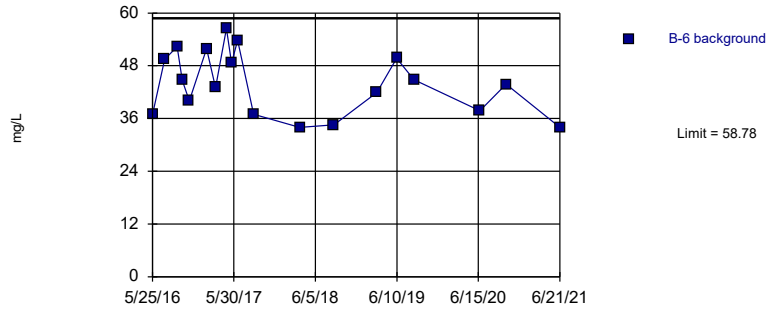
Constituent: Calcium, total Analysis Run 12/30/2022 9:35 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-1B (bg)



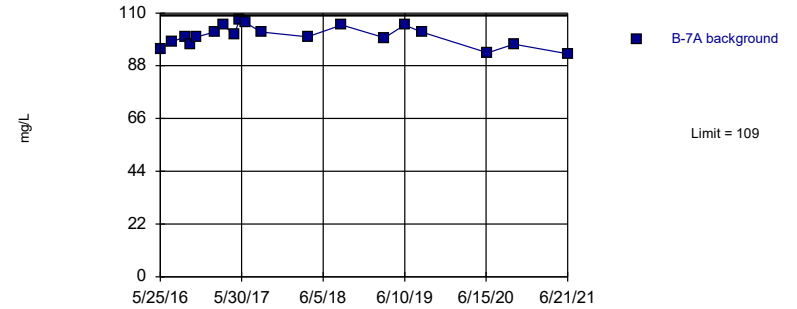
Prediction Limit  
Intrawell Parametric, B-6



Background Data Summary: Mean=43.94, Std. Dev.=7.134, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.946, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

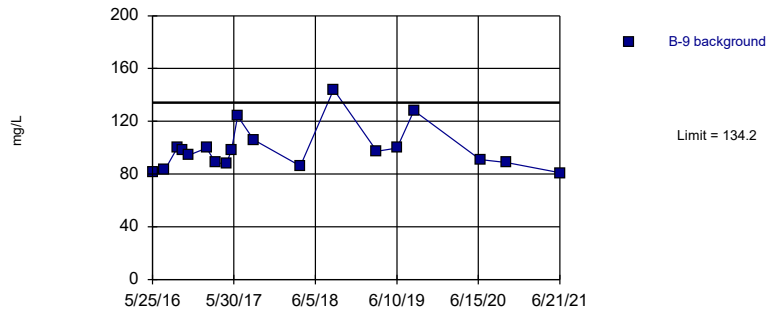
Prediction Limit  
Intrawell Parametric, B-7A (bg)



Background Data Summary: Mean=100.4, Std. Dev.=4.131, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9582, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

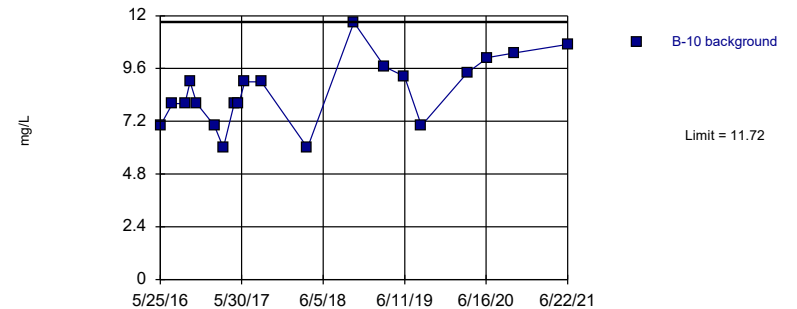
Prediction Limit  
Intrawell Parametric, B-9



Background Data Summary (based on square root transformation): Mean=9.908, Std. Dev.=0.8056, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8654, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
Intrawell Parametric, B-10

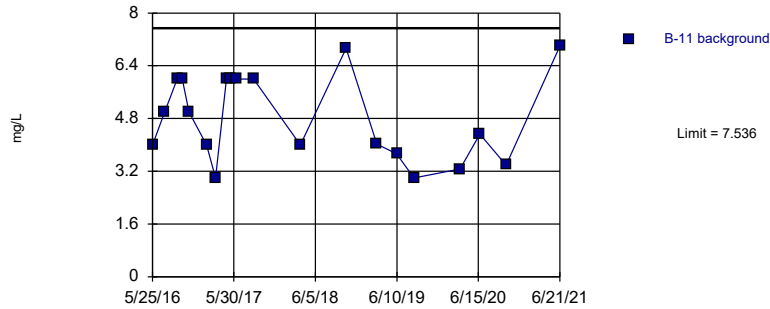


Background Data Summary: Mean=8.557, Std. Dev.=1.536, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9696, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



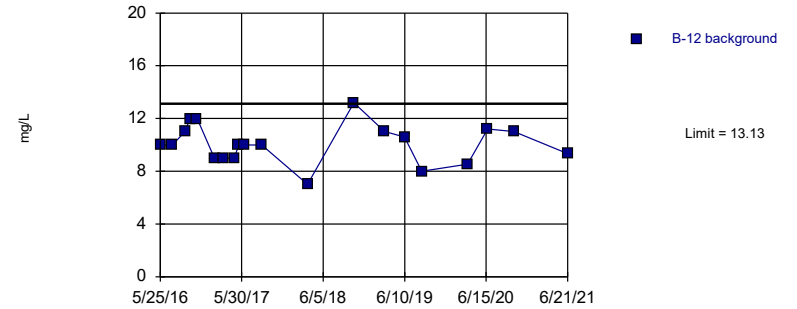
Prediction Limit  
Intrawell Parametric, B-11



Background Data Summary: Mean=4.834, Std. Dev.=1.313, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9048, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

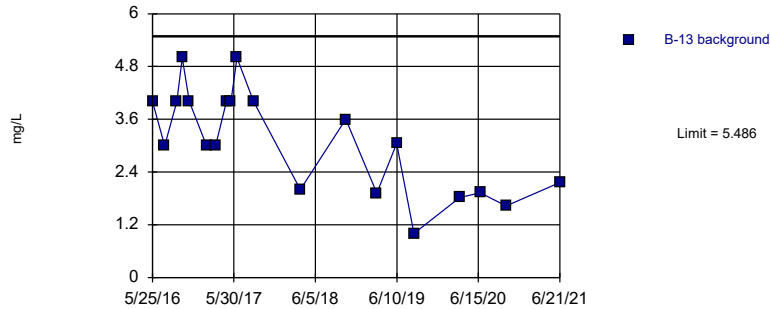
Prediction Limit  
Intrawell Parametric, B-12 (bg)



Background Data Summary: Mean=10.09, Std. Dev.=1.477, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9826, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

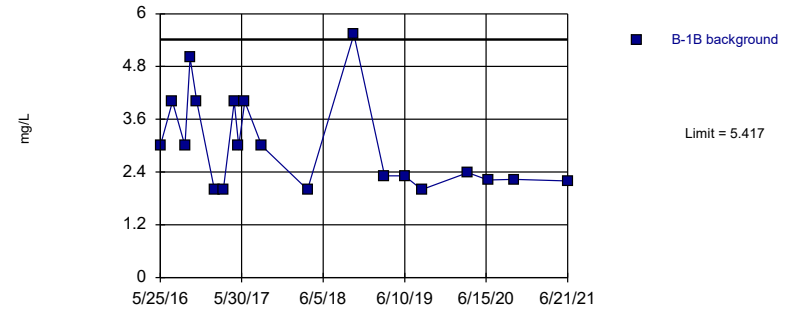
Prediction Limit  
Intrawell Parametric, B-13 (bg)



Background Data Summary: Mean=3.106, Std. Dev.=1.157, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.932, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

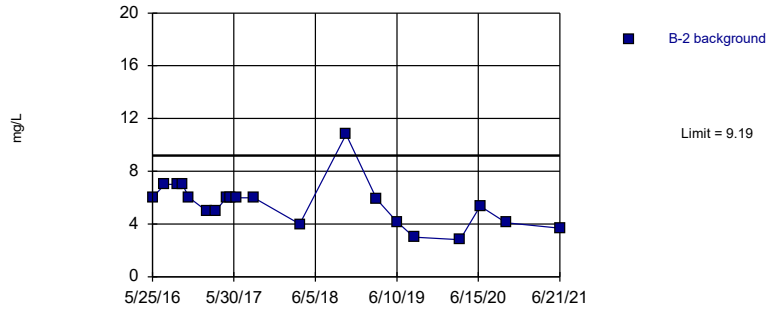
Prediction Limit  
Intrawell Parametric, B-1B (bg)



Background Data Summary (based on cube root transformation): Mean=1.426, Std. Dev.=0.1602, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8727, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

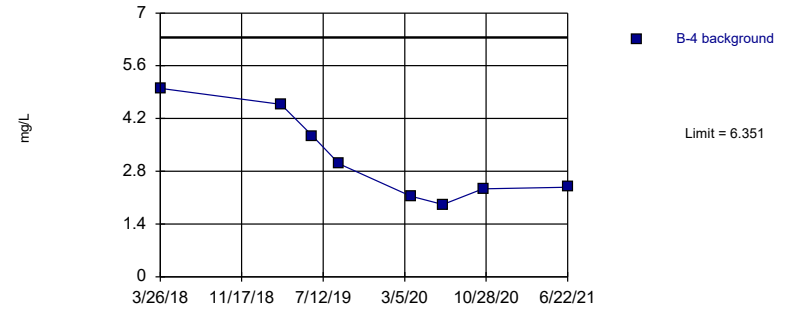
Prediction Limit  
Intrawell Parametric, B-2



Background Data Summary: Mean=5.54, Std. Dev.=1.774, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8941, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

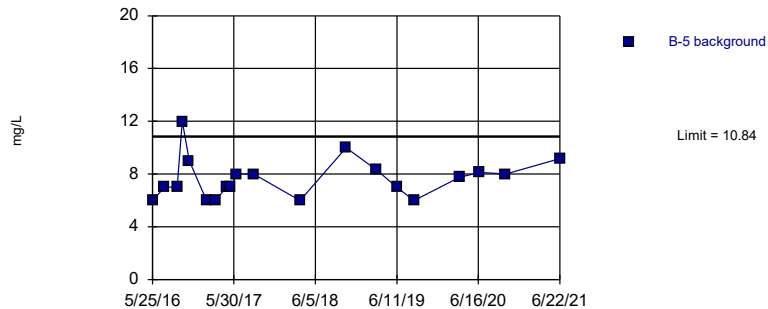
Prediction Limit  
Intrawell Parametric, B-4 (bg)



Background Data Summary: Mean=3.136, Std. Dev.=1.173, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8829, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

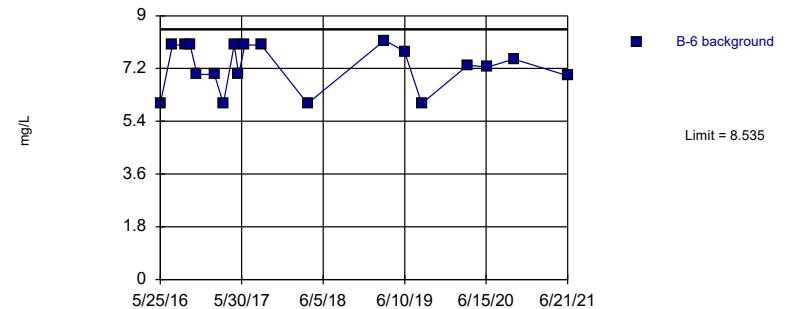
Prediction Limit  
Intrawell Parametric, B-5 (bg)



Background Data Summary: Mean=7.668, Std. Dev.=1.543, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8833, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
Intrawell Parametric, B-6

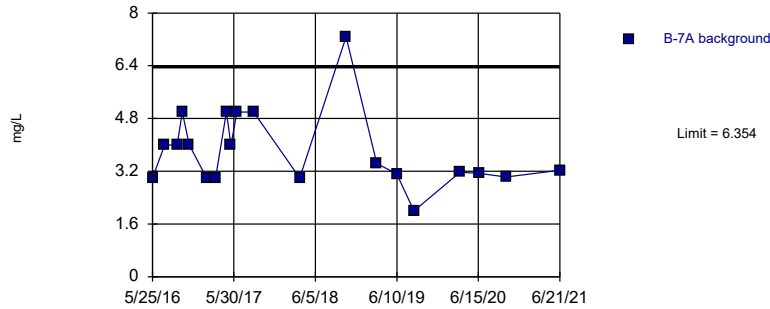


Background Data Summary (based on x^4 transformation): Mean=2958, Std. Dev.=1128, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8679, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-7A (bg)

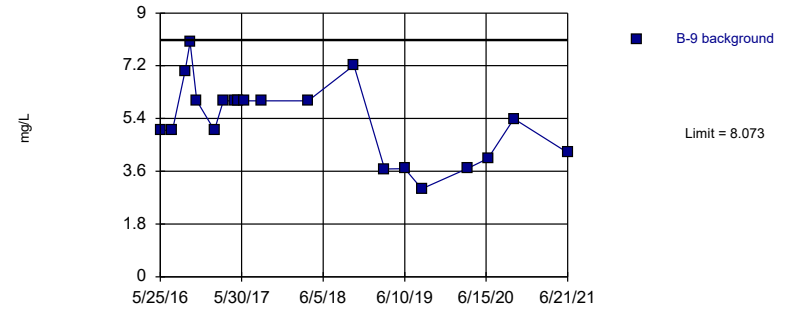


Background Data Summary (based on square root transformation): Mean=1.935, Std. Dev.=0.2848, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8938, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-9

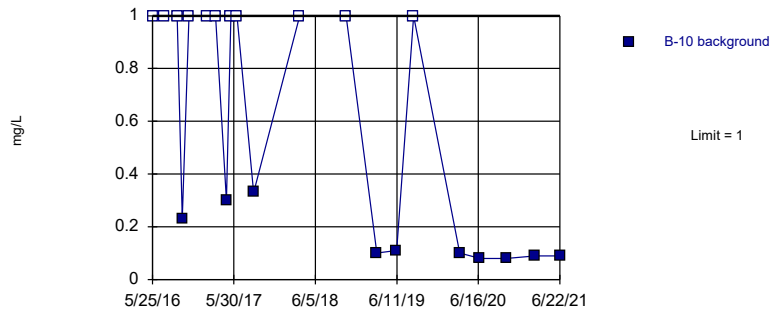


Background Data Summary: Mean=5.348, Std. Dev.=1.324, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9483, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Non-parametric, B-10

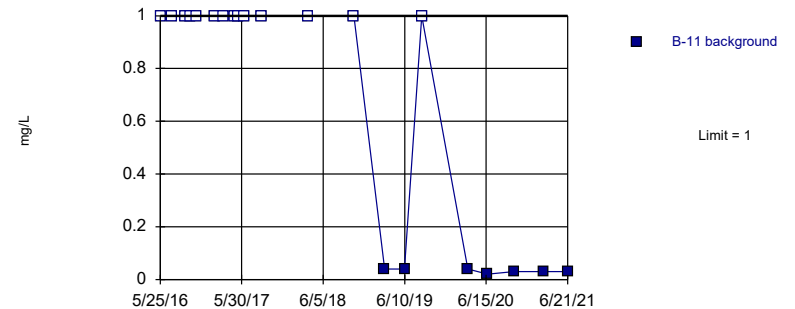


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 52.38% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

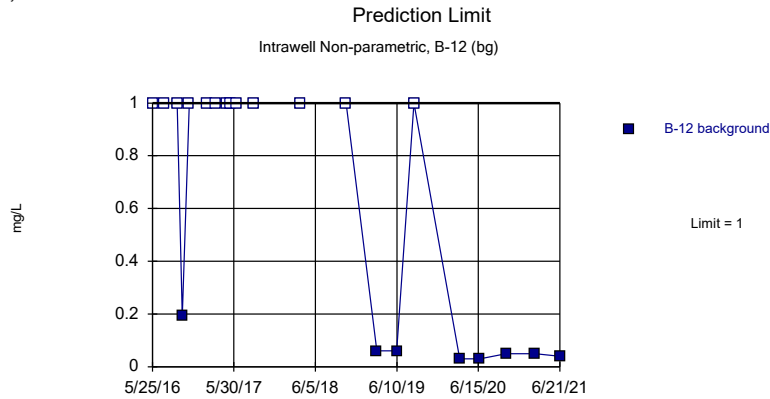
### Prediction Limit

Intrawell Non-parametric, B-11



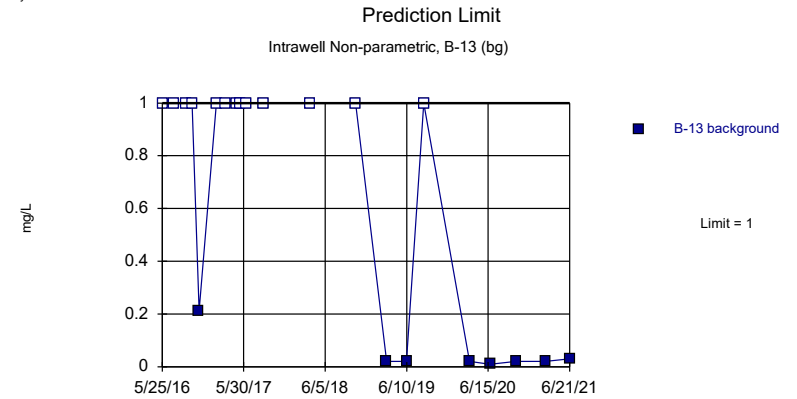
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 66.67% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



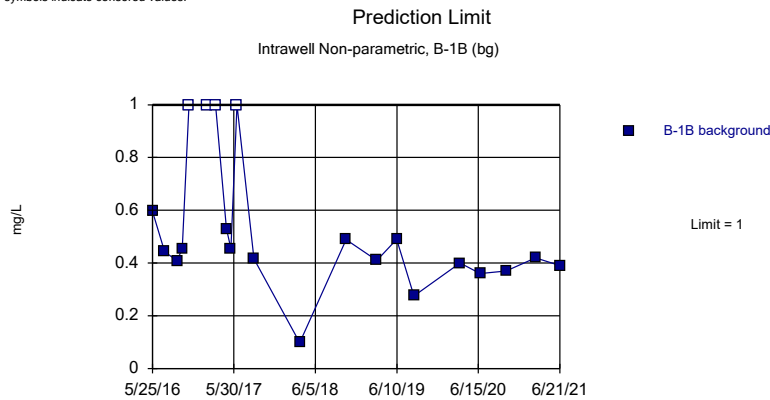
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 61.9% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



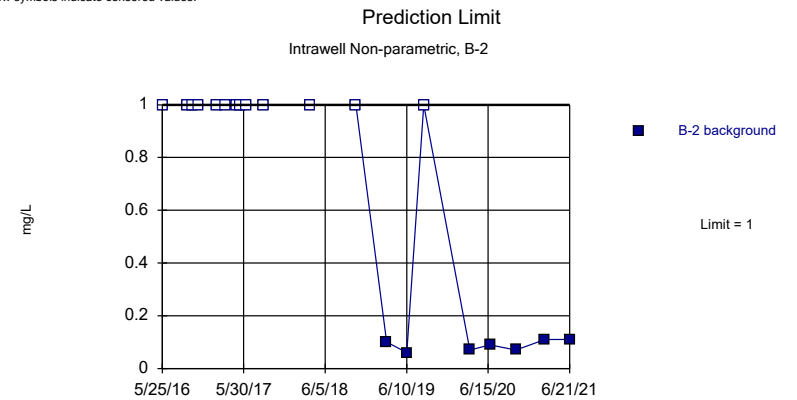
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 61.9% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. 19.05% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

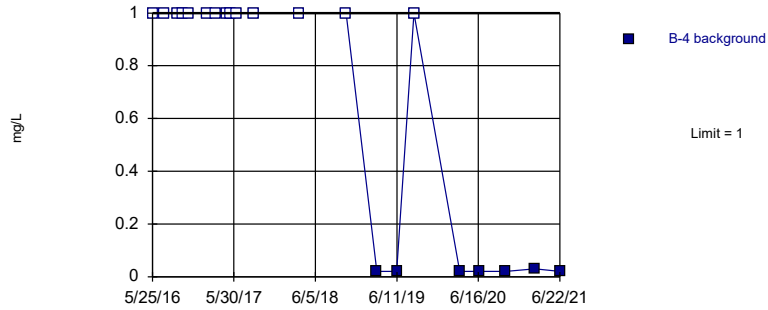
Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 65% NDs. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

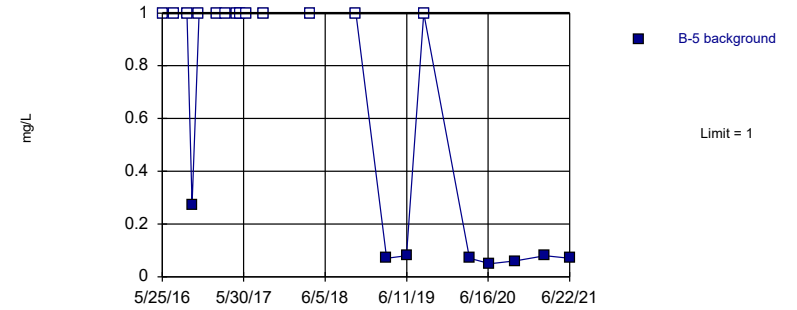
Prediction Limit  
Intrawell Non-parametric, B-4 (bg)



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 66.67% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

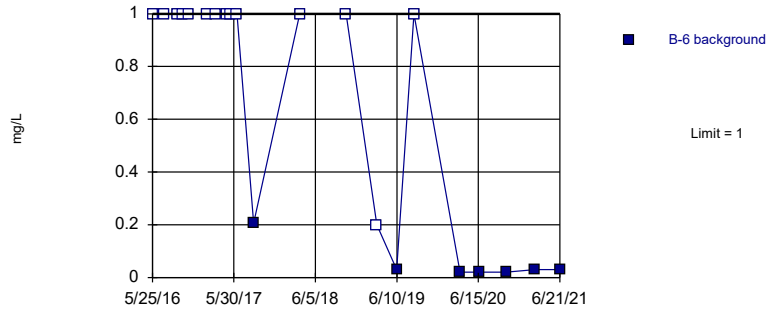
Prediction Limit  
Intrawell Non-parametric, B-5 (bg)



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 61.9% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

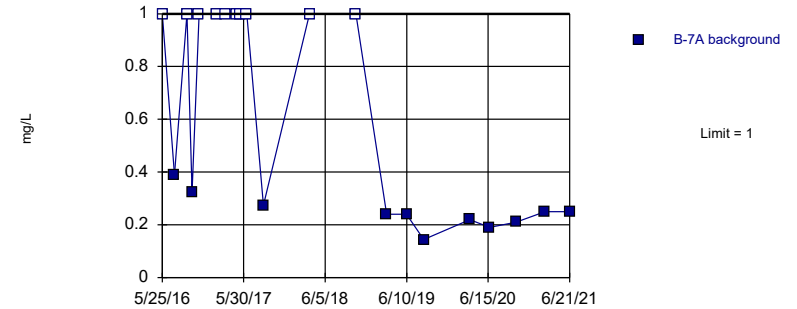
Prediction Limit  
Intrawell Non-parametric, B-6



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 66.67% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

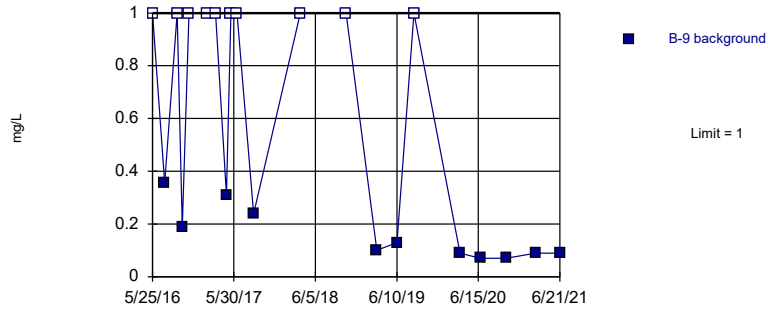
Prediction Limit  
Intrawell Non-parametric, B-7A (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. 47.62% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

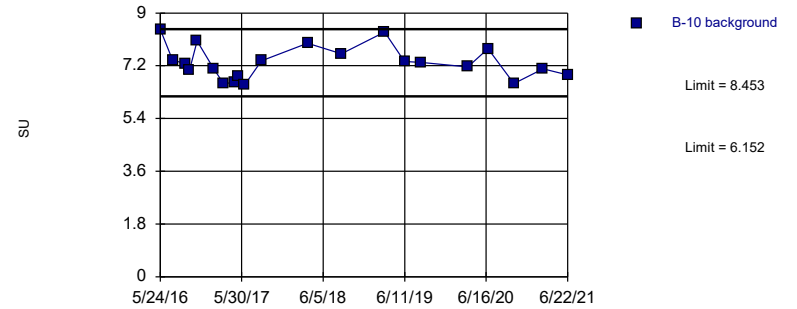
Prediction Limit  
 Intrawell Non-parametric, B-9



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. 47.62% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

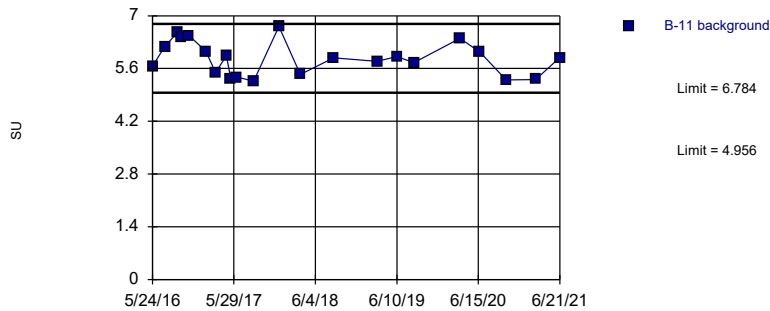
Prediction Limit  
 Intrawell Parametric, B-10



Background Data Summary: Mean=7.302, Std. Dev.=0.5629, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.943, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

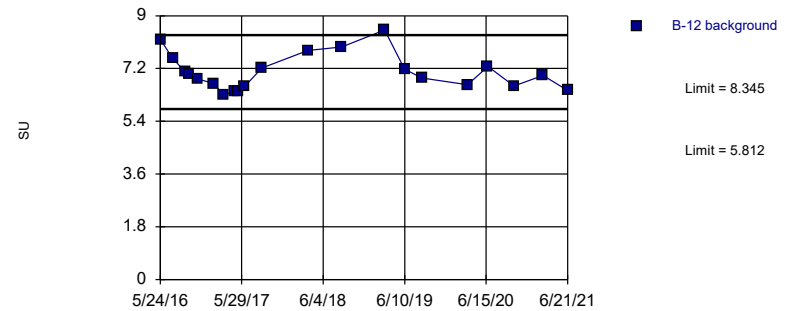
Prediction Limit  
 Intrawell Parametric, B-11



Background Data Summary: Mean=5.87, Std. Dev.=0.4502, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9405, critical = 0.878. Kappa = 2.031 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
 Intrawell Parametric, B-12 (bg)

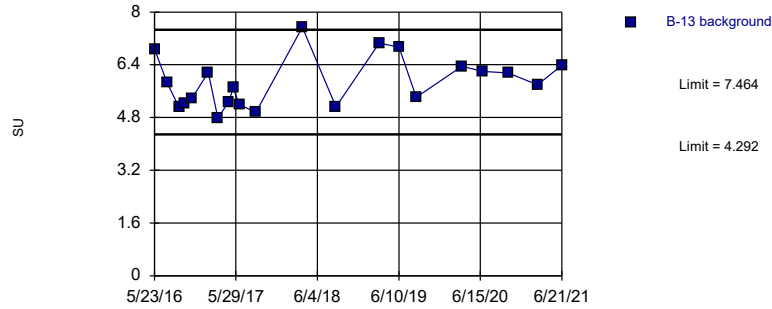


Background Data Summary: Mean=7.079, Std. Dev.=0.6193, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9176, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit

Intrawell Parametric, B-13 (bg)

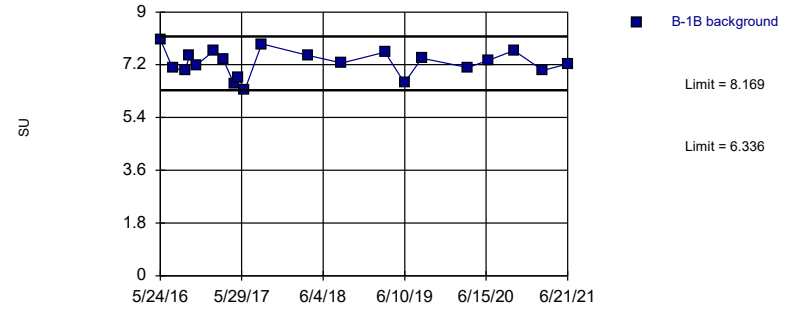


Background Data Summary: Mean=5.878, Std. Dev.=0.7758, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9436, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

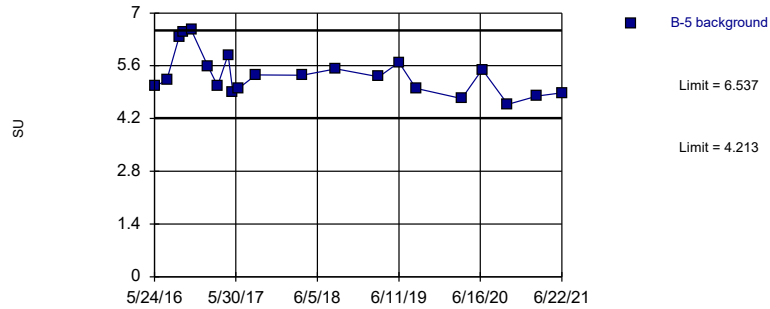
Prediction Limit

Intrawell Parametric, B-1B (bg)



### Prediction Limit

Intrawell Parametric, B-5 (bg)

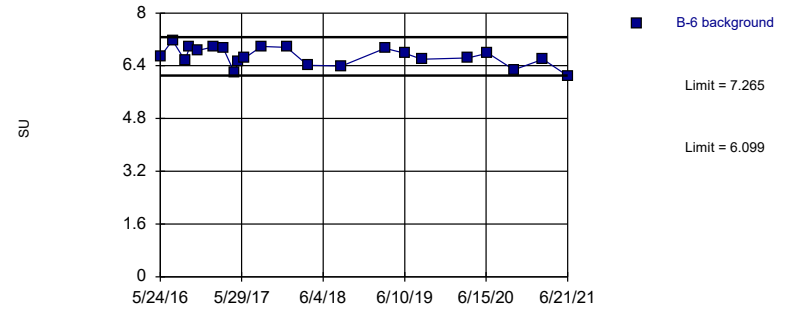


Background Data Summary: Mean=5.375, Std. Dev.=0.5683, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-6

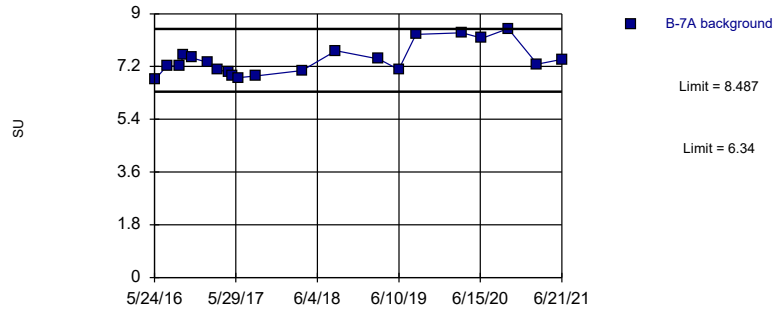


Background Data Summary: Mean=6.682, Std. Dev.=0.2871, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9623, critical = 0.878. Kappa = 2.031 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-7A (bg)

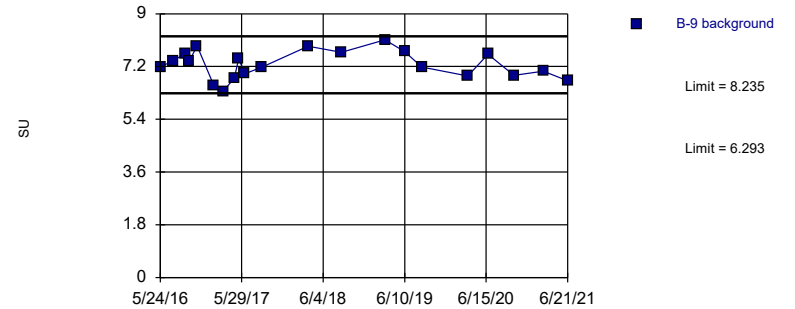


Background Data Summary: Mean=7.413, Std. Dev.=0.5252, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9028, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-9

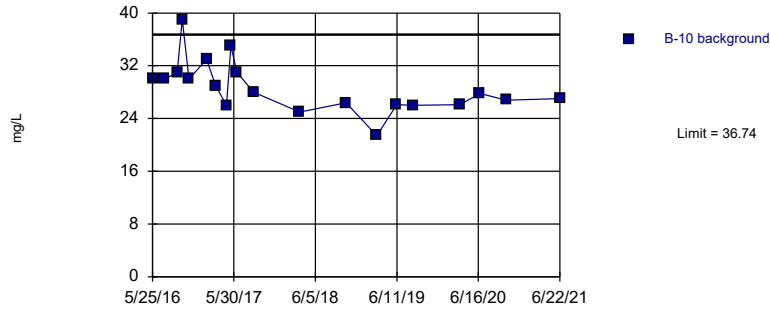


Background Data Summary: Mean=7.264, Std. Dev.=0.475, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9811, critical = 0.873. Kappa = 2.044 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



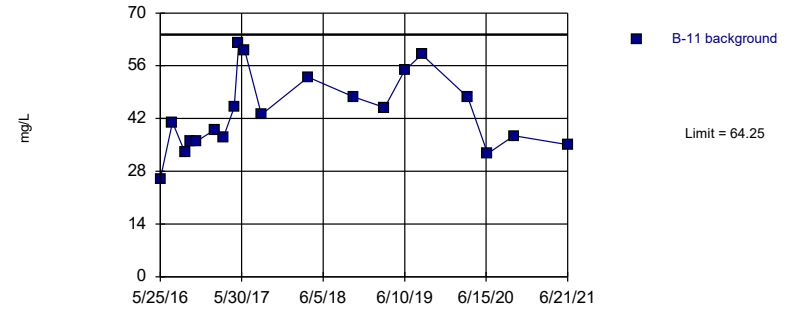
Prediction Limit  
Intrawell Parametric, B-10



Background Data Summary: Mean=28.73, Std. Dev.=3.894, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9341, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

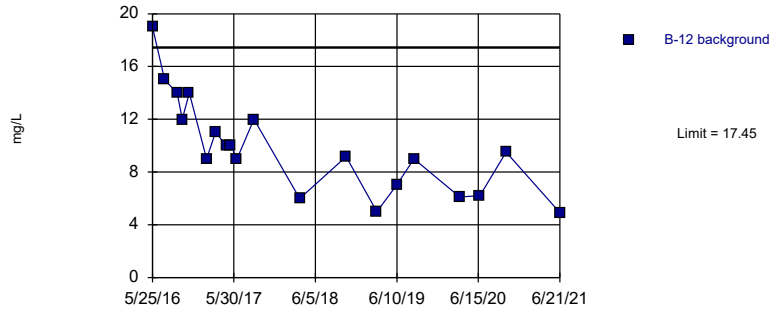
Prediction Limit  
Intrawell Parametric, B-11



Background Data Summary: Mean=43.51, Std. Dev.=10.08, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.952, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

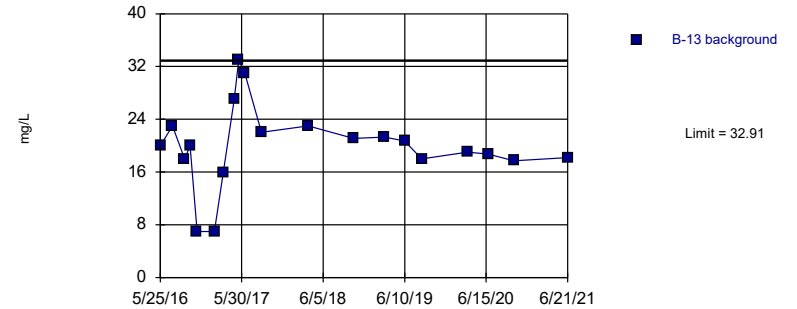
Prediction Limit  
Intrawell Parametric, B-12 (bg)



Background Data Summary: Mean=9.894, Std. Dev.=3.673, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.943, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:36 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
Intrawell Parametric, B-13 (bg)

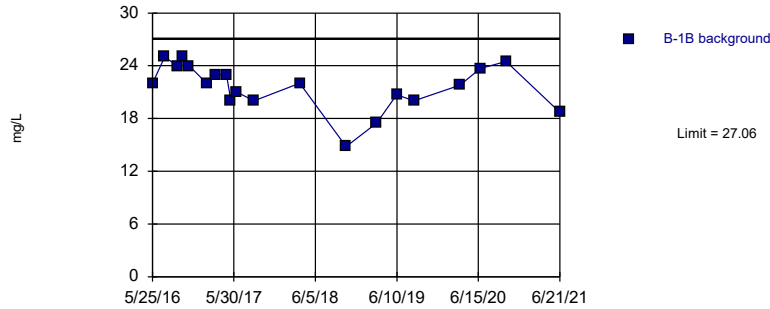


Background Data Summary: Mean=20.09, Std. Dev.=6.23, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9078, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

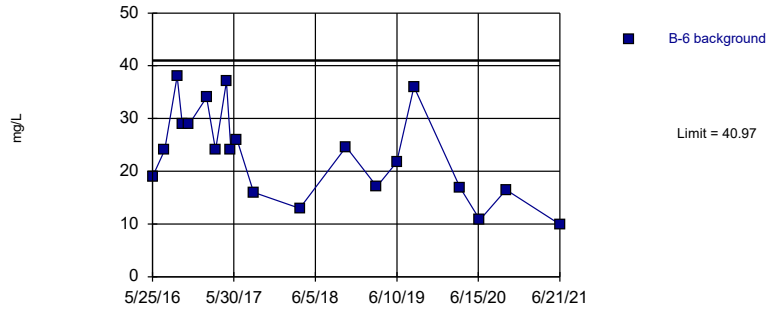
Constituent: Sulfate, total Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit

Intrawell Parametric, B-1B (bg)



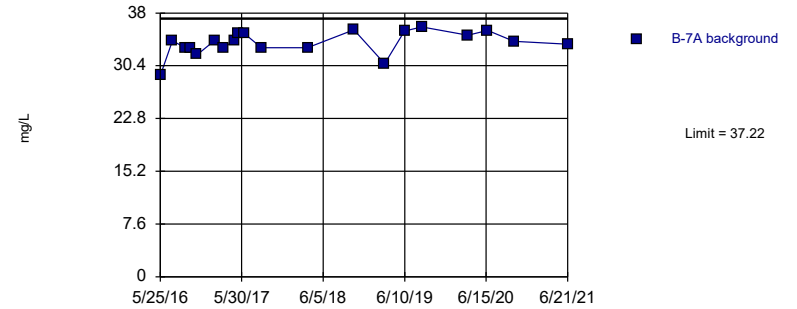
Prediction Limit  
Intrawell Parametric, B-6



Background Data Summary: Mean=23.33, Std. Dev.=8.572, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9528, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

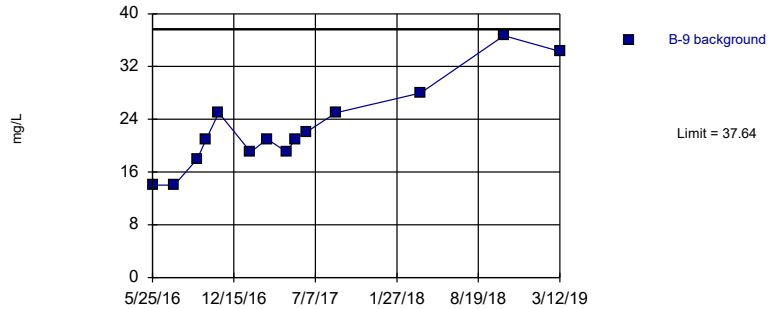
Prediction Limit  
Intrawell Parametric, B-7A (bg)



Background Data Summary: Mean=33.67, Std. Dev.=1.723, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9106, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

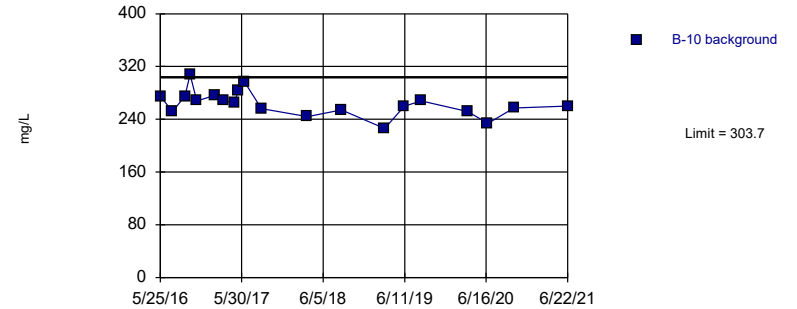
Prediction Limit  
Intrawell Parametric, B-9



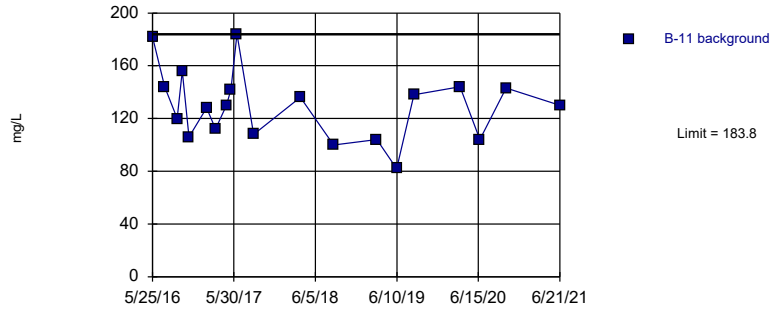
Background Data Summary: Mean=22.71, Std. Dev.=6.675, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9143, critical = 0.825. Kappa = 2.236 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
Intrawell Parametric, B-10



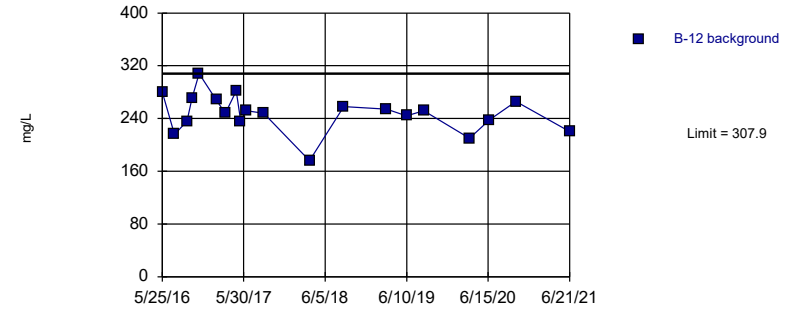
Prediction Limit  
Intrawell Parametric, B-11



Background Data Summary: Mean=129.7, Std. Dev.=26.3, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9549, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

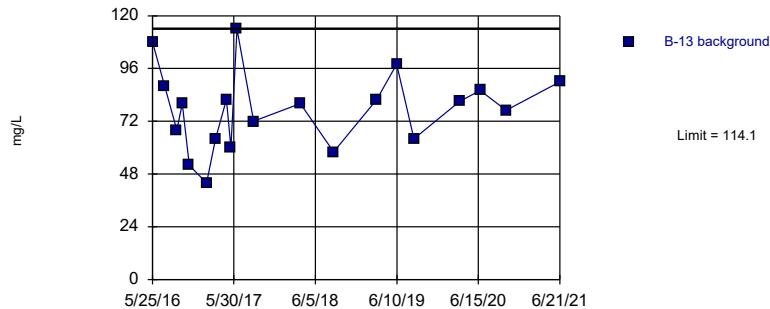
Prediction Limit  
Intrawell Parametric, B-12 (bg)



Background Data Summary: Mean=248.2, Std. Dev.=29.06, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9744, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

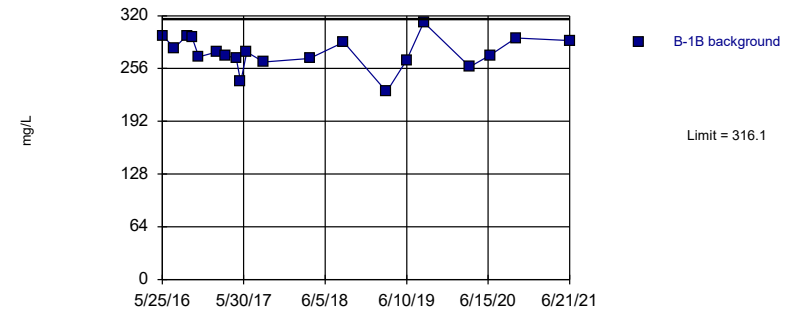
Prediction Limit  
Intrawell Parametric, B-13 (bg)



Background Data Summary: Mean=77.4, Std. Dev.=17.82, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9809, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

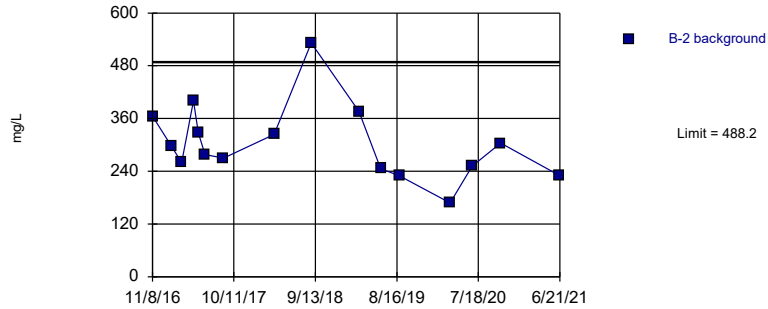
Prediction Limit  
Intrawell Parametric, B-1B (bg)



Background Data Summary: Mean=275.4, Std. Dev.=19.78, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9557, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

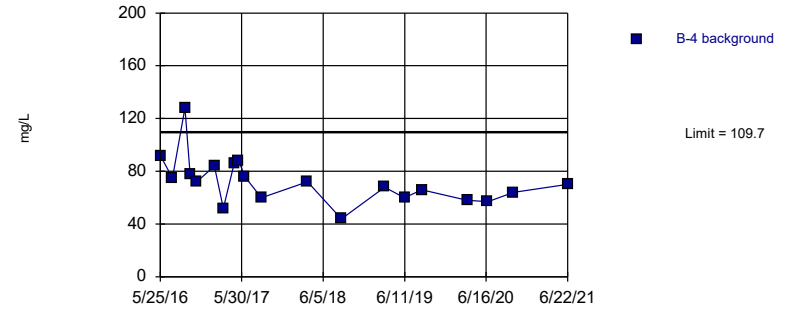
Prediction Limit  
Intrawell Parametric, B-2



Background Data Summary: Mean=303.7, Std. Dev.=85.8, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9253, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

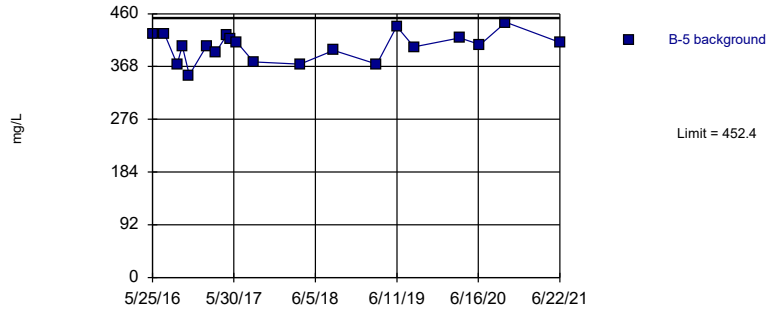
Prediction Limit  
Intrawell Parametric, B-4 (bg)



Background Data Summary: Mean=72.5, Std. Dev.=18.07, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9047, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

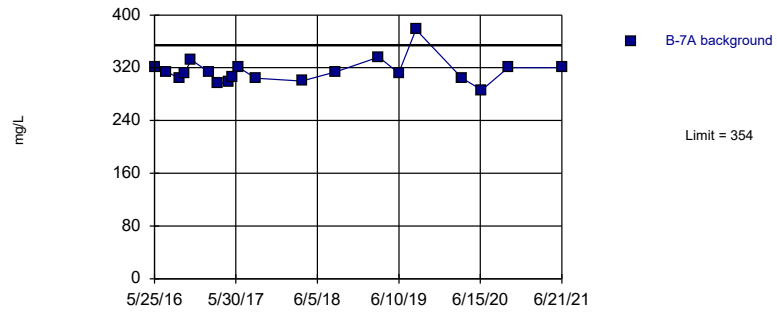
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Prediction Limit  
Intrawell Parametric, B-5 (bg)



### Prediction Limit

Intrawell Parametric, B-7A (bg)

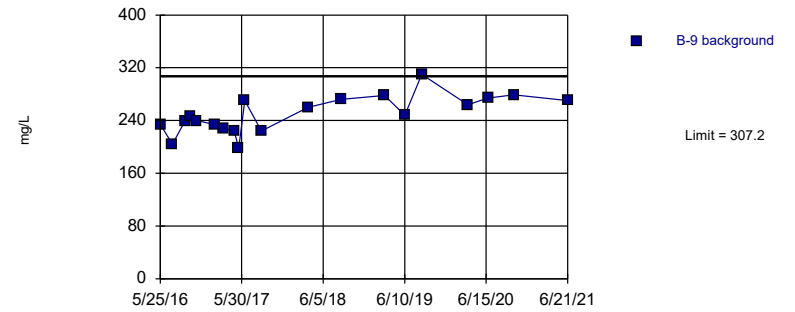


Background Data Summary (based on natural log transformation): Mean=5.749, Std. Dev.=0.05824, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8699, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit

Intrawell Parametric, B-9



Background Data Summary: Mean=249.8, Std. Dev.=27.9, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.972, critical = 0.868. Kappa = 2.058 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/30/2022 9:37 AM View: Appendix III - Intrawell  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

FIGURE E.

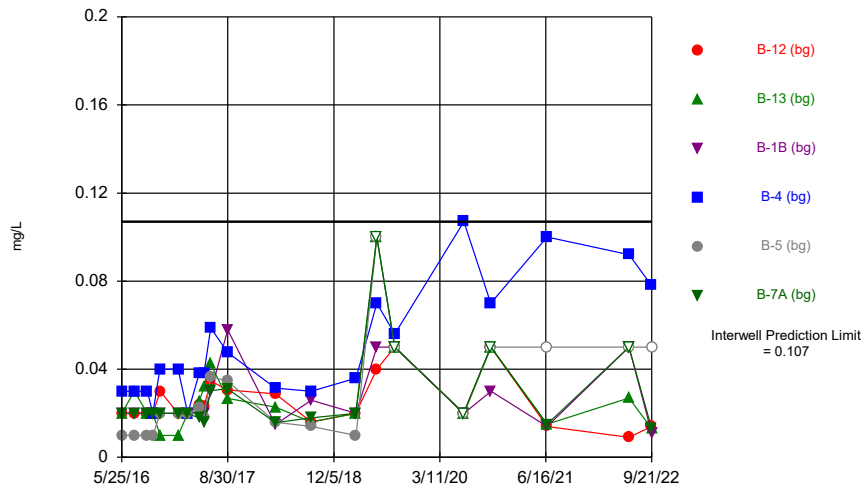
# Interwell Prediction Limits - All Results

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/30/2022, 9:44 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Lim.Date</u>	<u>Observ.</u>	<u>Sig. Bg</u>	<u>N Bg</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron, total (mg/L)	n/a	0.107	n/a	n/a	5 future	n/a	126	n/a	n/a	17.46	n/a	n/a	0.0001245	NP Inter (normality) 1 of 2

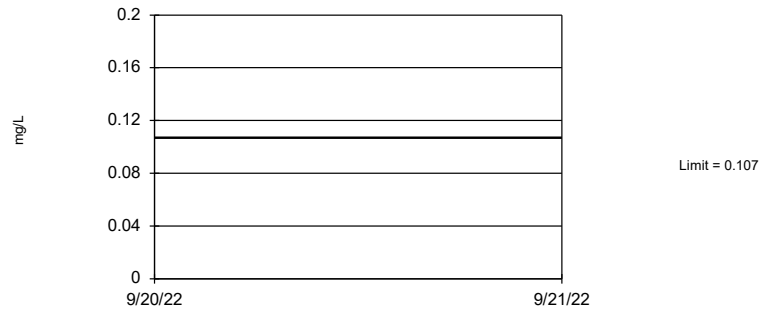


### Time Series



Constituent: Boron, total Analysis Run 12/30/2022 9:43 AM View: Appendix III - Interwell  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 126 background values. 17.46% NDs. Annual per-constituent alpha = 0.001244. Individual comparison alpha = 0.0001245 (1 of 2). Assumes 5 future values.

Constituent: Boron, total    Analysis Run 12/30/2022 9:42 AM    View: Appendix III - Interwell  
Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF

FIGURE F.

# Upper Tolerance Limit Summary Table

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/29/2022, 12:20 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 144	n/a	n/a	64.58	n/a	n/a	0.0006197	NP Inter(NDs)
Arsenic, total (mg/L)	n/a	0.008	n/a	n/a	n/a	n/a 144	n/a	n/a	36.11	n/a	n/a	0.0006197	NP Inter(normality)
Barium, total (mg/L)	n/a	0.131	n/a	n/a	n/a	n/a 144	n/a	n/a	0	n/a	n/a	0.0006197	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	30.56	n/a	n/a	0.0006197	NP Inter(normality)
Cadmium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	38.19	n/a	n/a	0.0006197	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.006	n/a	n/a	n/a	n/a 143	n/a	n/a	7.692	n/a	n/a	0.0006523	NP Inter(normality)
Cobalt, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 142	n/a	n/a	2.817	n/a	n/a	0.0006867	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	n/a	8.79	n/a	n/a	n/a	n/a 138	n/a	n/a	0	n/a	n/a	0.0008431	NP Inter(normality)
Fluoride, total (mg/L)	n/a	1	n/a	n/a	n/a	n/a 150	n/a	n/a	45.33	n/a	n/a	0.0004556	NP Inter(normality)
Lead, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 143	n/a	n/a	44.06	n/a	n/a	0.0006523	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.041	n/a	n/a	n/a	n/a 138	n/a	n/a	1.449	n/a	n/a	0.0008431	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.0005	n/a	n/a	n/a	n/a 144	n/a	n/a	62.5	n/a	n/a	0.0006197	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.01	n/a	n/a	n/a	n/a 144	n/a	n/a	56.25	n/a	n/a	0.0006197	NP Inter(NDs)
Selenium, total (mg/L)	n/a	0.0392	n/a	n/a	n/a	n/a 144	n/a	n/a	47.92	n/a	n/a	0.0006197	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.002	n/a	n/a	n/a	n/a 144	n/a	n/a	89.58	n/a	n/a	0.0006197	NP Inter(NDs)

FIGURE G.

<b>FLINT CREEK LANDFILL GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR-Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.005	0.006
Arsenic, Total (mg/L)	0.01		0.008	0.01
Barium, Total (mg/L)	2		0.131	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.001	0.005
Chromium, Total (mg/L)	0.1		0.006	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.005	0.006
Combined Radium, Total (pCi/L)	5		8.79	8.79
Fluoride, Total (mg/L)	4		1	4
Lead, Total (mg/L)	n/a	0.015	0.005	0.015
Lithium, Total (mg/L)	n/a	0.04	0.041	0.041
Mercury, Total (mg/L)	0.002		0.0005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.01	0.1
Selenium, Total (mg/L)	0.05		0.0392	0.05
Thallium, Total (mg/L)	0.002		0.002	0.002

*\*Grey cell indicates background limit is higher than MCL or CCR-Rule Specified level*

*\*GWPS = Groundwater Protection Standard*

*\*MCL = Maximum Contaminant Level*

*\*CCR = Coal Combustion Residual*

FIGURE H.

# Confidence Intervals - All Results (No Significant)

Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF    Printed 12/29/2022, 12:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	B-10	0.005	0.00011	0.006	No	24	0.002363	0.002478	45.83	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-11	0.005	0.0001	0.006	No	24	0.002352	0.002481	91.67	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-2	0.001816	0.00004	0.006	No	24	0.001631	0.002165	45.83	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-6	0.005	0.00008	0.006	No	24	0.002202	0.002433	79.17	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-9	0.005	0.00003	0.006	No	24	0.002203	0.002432	50	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-10	0.005	0.00038	0.01	No	24	0.002412	0.002215	33.33	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-11	0.005	0.00017	0.01	No	23	0.002168	0.002419	30.43	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-2	0.002573	0.00022	0.01	No	24	0.00236	0.003818	16.67	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-6	0.003636	0.00018	0.01	No	24	0.001809	0.002043	25	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-9	0.005	0.00056	0.01	No	24	0.002255	0.002009	33.33	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-10	0.0831	0.078	2	No	24	0.08189	0.007604	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-11	0.1286	0.1027	2	No	23	0.1156	0.0248	0	None	No	0.01	Param.
Barium, total (mg/L)	B-2	0.08726	0.05327	2	No	23	0.07741	0.049	0	None	ln(x)	0.01	Param.
Barium, total (mg/L)	B-6	0.05953	0.04582	2	No	24	0.05268	0.01344	0	None	No	0.01	Param.
Barium, total (mg/L)	B-9	0.1598	0.1449	2	No	24	0.1524	0.0146	0	None	No	0.01	Param.
Beryllium, total (mg/L)	B-10	0.0005	0.000039	0.004	No	24	0.0003746	0.0004321	66.67	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	B-11	0.0004883	0.0002412	0.004	No	23	0.000439	0.0004033	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	B-2	0.0002025	0.00009238	0.004	No	23	0.000194	0.0002282	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	B-6	0.000103	0.00002427	0.004	No	24	0.0001603	0.0002293	20.83	Kaplan-Meier	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	B-9	0.0005	0.00003	0.004	No	24	0.000281	0.0003983	62.5	Kaplan-Meier	No	0.01	NP (NDs)
Cadmium, total (mg/L)	B-10	0.001	0.000026	0.005	No	24	0.000457	0.0004759	45.83	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-11	0.0003098	0.00009648	0.005	No	23	0.0003351	0.0004644	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	B-2	0.0008704	0.000024	0.005	No	24	0.0003661	0.0004516	29.17	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-6	0.00027	0.000018	0.005	No	24	0.0003448	0.0004364	37.5	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-9	0.001	0.00002	0.005	No	24	0.0004889	0.0004828	66.67	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	B-10	0.002	0.00059	0.1	No	24	0.003284	0.007849	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-11	0.00327	0.00092	0.1	No	23	0.003649	0.005571	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-2	0.004	0.00145	0.1	No	24	0.005135	0.008514	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-6	0.003793	0.002034	0.1	No	24	0.003181	0.00223	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	B-9	0.002279	0.001169	0.1	No	24	0.001724	0.001088	0	None	No	0.01	Param.
Cobalt, total (mg/L)	B-10	0.0009868	0.0002803	0.006	No	24	0.0007778	0.001014	4.167	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-11	0.0006994	0.0001727	0.006	No	23	0.0009169	0.001545	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	B-2	0.0006091	0.000135	0.006	No	22	0.000769	0.001323	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	B-6	0.001252	0.0003005	0.006	No	24	0.0009944	0.001163	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-9	0.0009983	0.0003882	0.006	No	24	0.0006932	0.0005978	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-10	1.487	0.9603	8.79	No	23	1.224	0.5036	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-11	1.67	0.835	8.79	No	23	2.001	2.844	0	None	No	0.01	NP (normality)
Combined Radium 226 + 228 (pCi/L)	B-2	2.096	1.254	8.79	No	23	1.742	0.8743	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-6	1.695	0.6227	8.79	No	23	1.847	3.045	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-9	1.87	0.7201	8.79	No	23	1.563	1.883	0	None	x^(1/3)	0.01	Param.
Fluoride, total (mg/L)	B-10	1	0.1	4	No	25	0.5153	0.443	44	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	B-11	1	0.04	4	No	25	0.5772	0.4869	64	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-2	1	0.09	4	No	24	0.5829	0.4633	54.17	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-6	1	0.03	4	No	25	0.5471	0.4835	60	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-9	1	0.09	4	No	25	0.4813	0.4381	40	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-10	0.005	0.00014	0.015	No	24	0.002041	0.002211	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-11	0.0005856	0.00009387	0.015	No	23	0.001964	0.002618	47.83	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-2	0.0004891	0.00008299	0.015	No	23	0.001761	0.003025	34.78	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-6	0.001398	0.0003134	0.015	No	24	0.001116	0.001378	4.167	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	B-9	0.005	0.0002	0.015	No	24	0.001938	0.002229	54.17	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	B-10	0.00357	0.00137	0.041	No	23	0.0032	0.003389	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-11	0.004802	0.001715	0.041	No	23	0.005119	0.007342	0	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	B-2	0.005	0.00102	0.041	No	23	0.004933	0.007027	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-6	0.00238	0.000407	0.041	No	22	0.001381	0.001197	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-9	0.00409	0.00272	0.041	No	23	0.004043	0.002972	0	None	No	0.01	NP (normality)



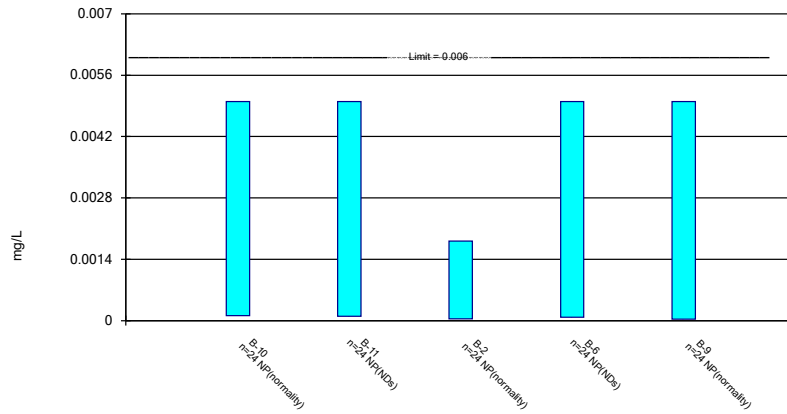
# Confidence Intervals - All Results (No Significant)

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/29/2022, 12:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Mercury, total (mg/L)	B-10	0.000025	0.000005	0.002	No	24	0.00001511	0.000009939	75	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-11	0.000025	0.000005	0.002	No	24	0.00002021	0.00001921	87.5	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-2	0.000025	0.000005	0.002	No	24	0.00001621	0.00001224	75	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-6	0.00001261	0.000005	0.002	No	24	0.00001127	0.000008551	58.33	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-9	0.000025	0.000005	0.002	No	24	0.00001565	0.00000996	87.5	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-10	0.00155	0.0007	0.1	No	24	0.00197	0.002673	8.333	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	B-11	0.005	0.0005	0.1	No	24	0.00268	0.002527	75	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-2	0.002556	0.0009775	0.1	No	24	0.002144	0.002242	8.333	None	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	B-6	0.0004922	0.0002754	0.1	No	24	0.001761	0.002402	41.67	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	B-9	0.005	0.0004	0.1	No	24	0.004484	0.007208	62.5	Kaplan-Meier	No	0.01	NP (NDs)
Selenium, total (mg/L)	B-10	0.005	0.00041	0.05	No	24	0.002532	0.00232	45.83	None	No	0.01	NP (normality)
Selenium, total (mg/L)	B-11	0.002963	0.002135	0.05	No	24	0.002973	0.001184	16.67	Kaplan-Meier	No	0.01	Param.
Selenium, total (mg/L)	B-2	0.02057	0.0067	0.05	No	24	0.01775	0.01885	0	None	No	0.01	NP (normality)
Selenium, total (mg/L)	B-6	0.002515	0.00151	0.05	No	24	0.002098	0.001091	4.167	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	B-9	0.005	0.0004	0.05	No	24	0.002549	0.002308	50	None	No	0.01	NP (normality)
Thallium, total (mg/L)	B-10	0.002	0.0002	0.002	No	24	0.00117	0.0008833	91.67	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-11	0.002	0.0002	0.002	No	24	0.001114	0.0008648	91.67	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-2	0.002	0.0001	0.002	No	24	0.001028	0.0008721	75	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-6	0.002	0.0002	0.002	No	24	0.001092	0.0008453	87.5	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-9	0.002	0.0002	0.002	No	24	0.001138	0.0008674	87.5	None	No	0.01	NP (NDs)

### Non-Parametric Confidence Interval

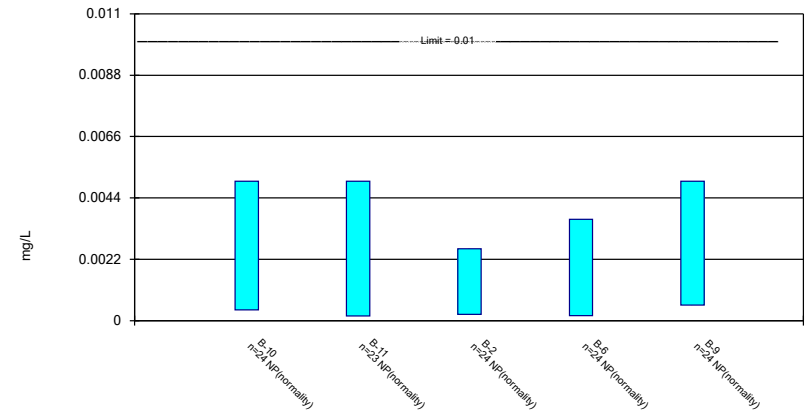
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

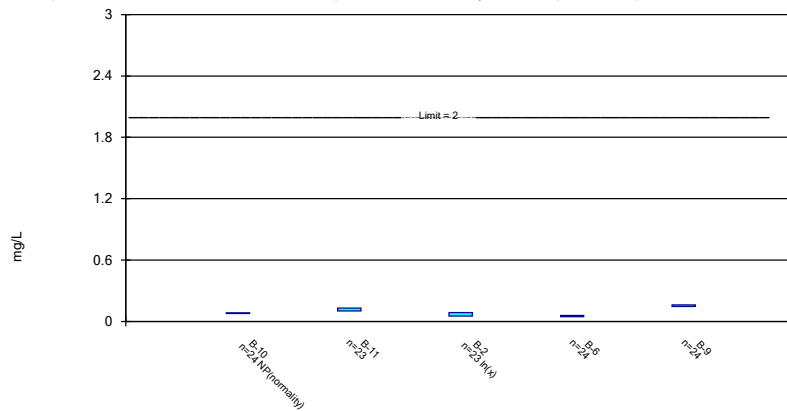
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

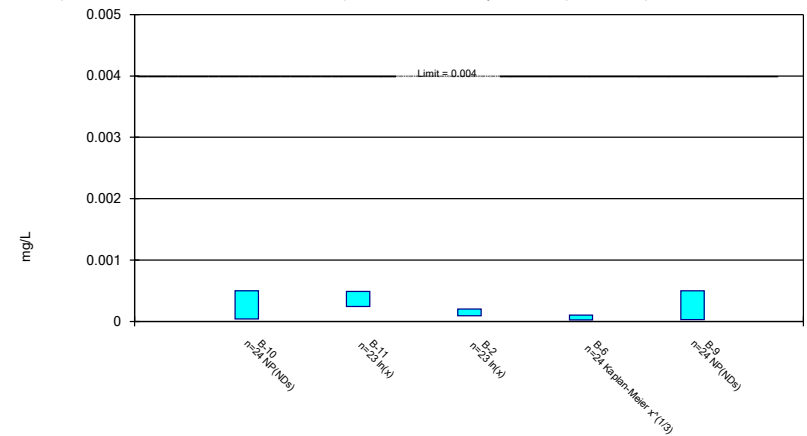
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

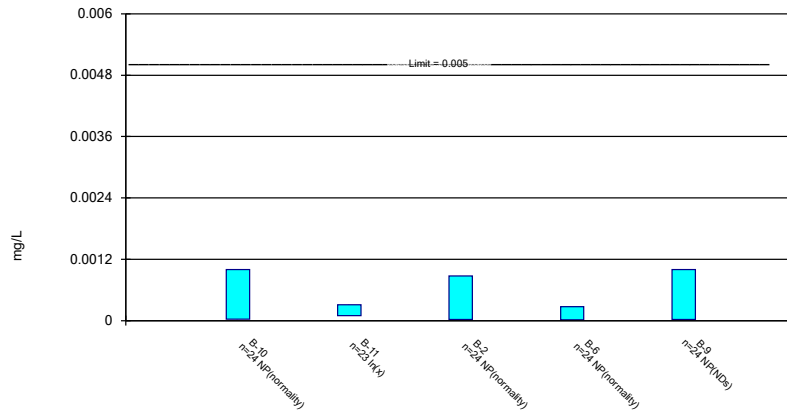
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Constituent: Beryllium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Parametric and Non-Parametric (NP) Confidence Interval

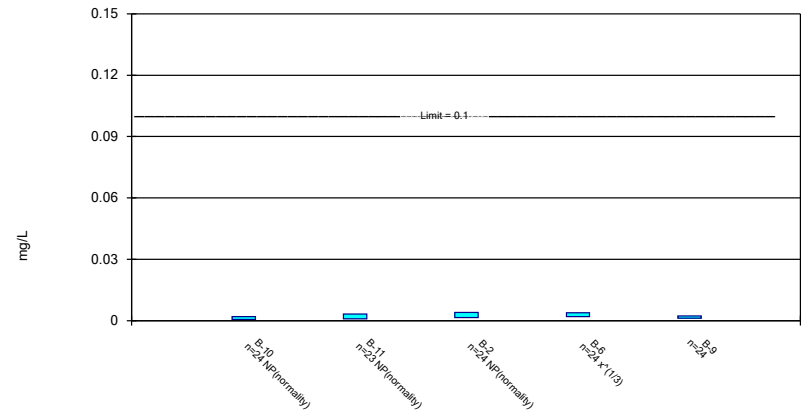
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Parametric and Non-Parametric (NP) Confidence Interval

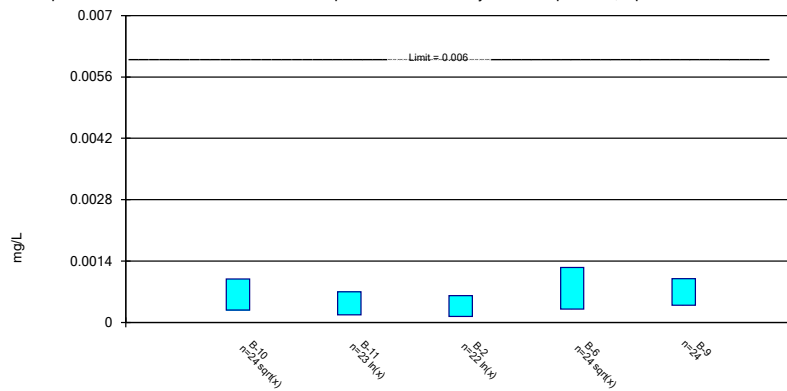
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Parametric Confidence Interval

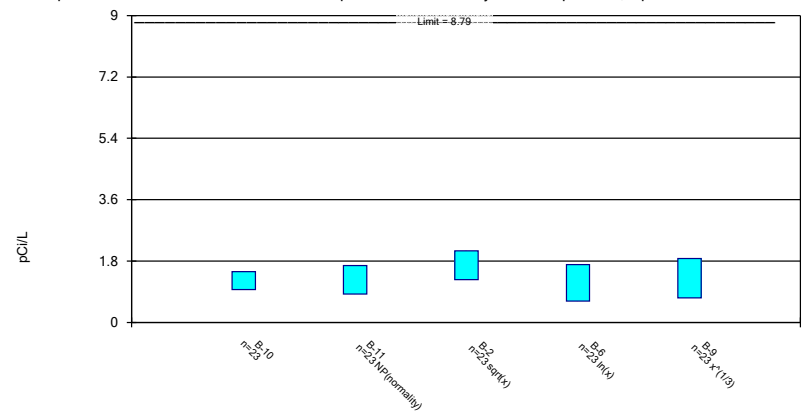
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Parametric and Non-Parametric (NP) Confidence Interval

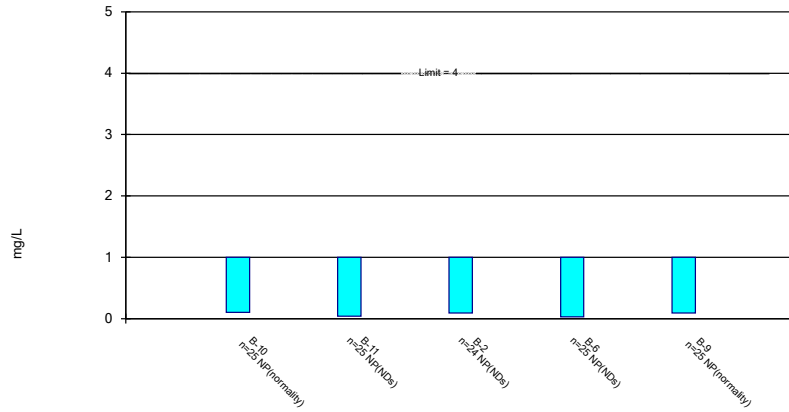
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

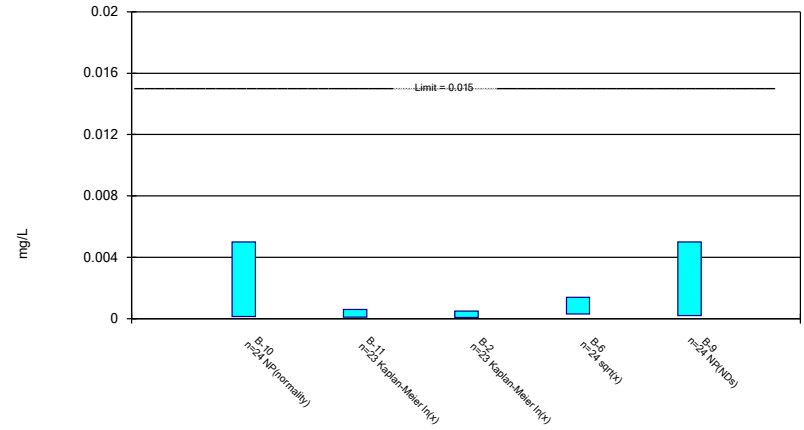
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

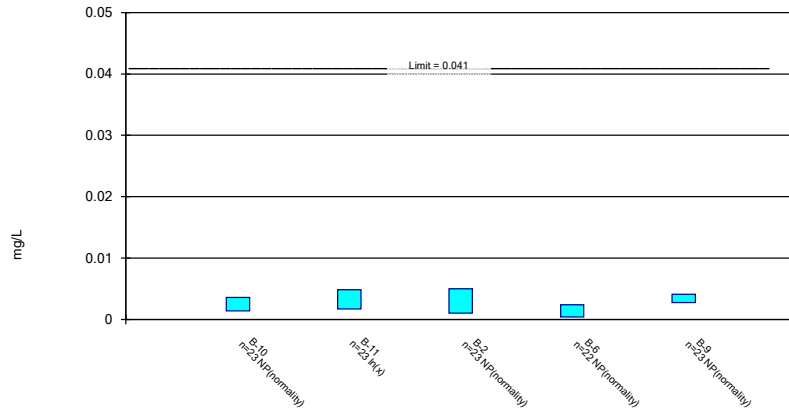
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

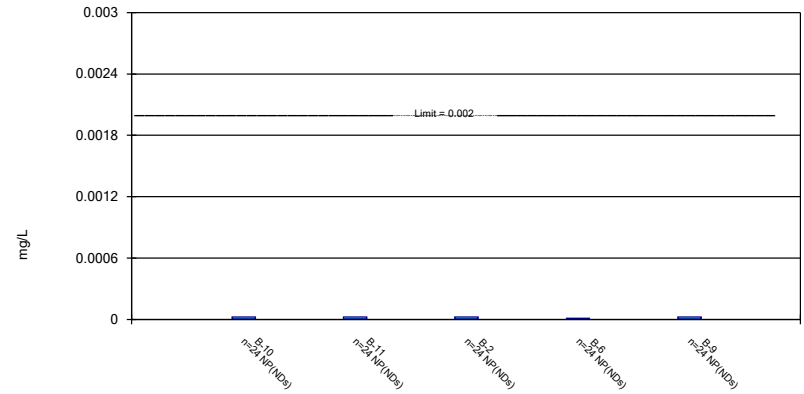
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

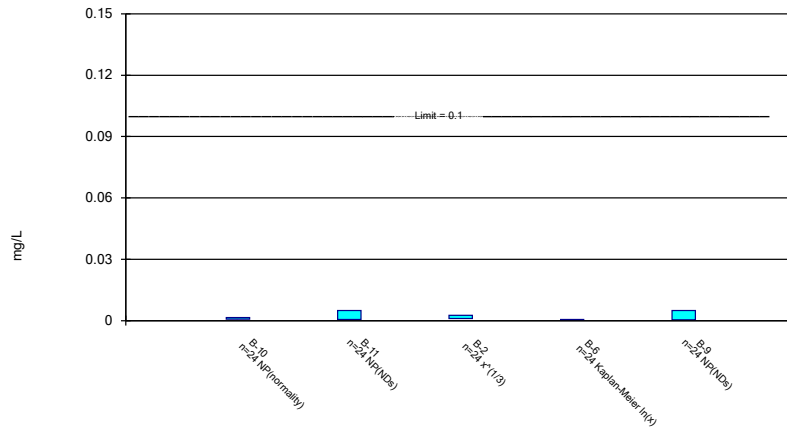
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

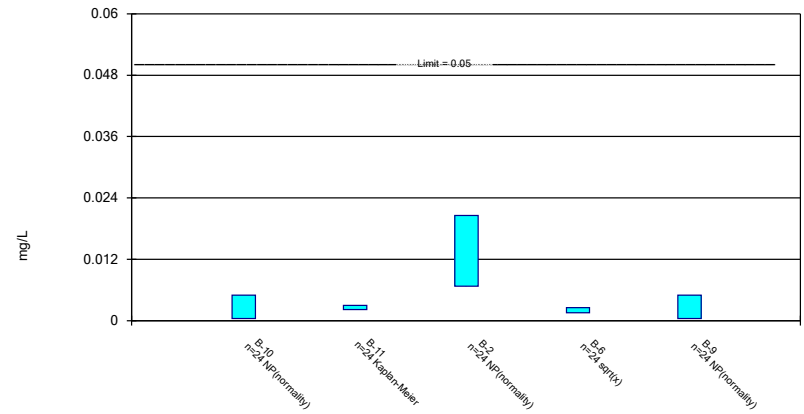
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

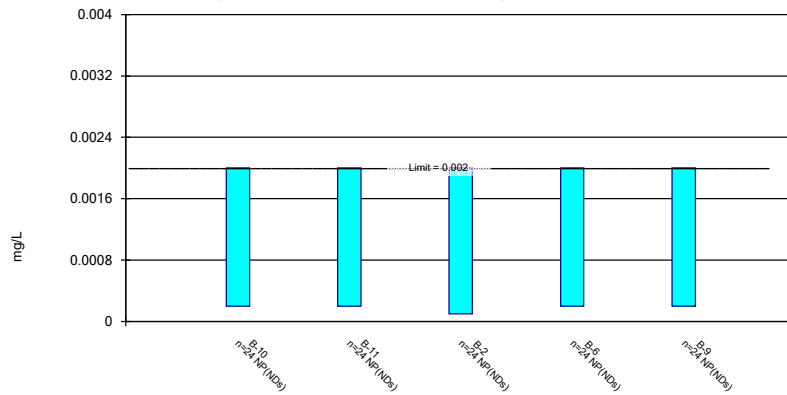
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 12/29/2022 12:23 PM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

# STATISTICAL ANALYSIS SUMMARY

## Flint Creek Plant Landfill Gentry, Arkansas

*Prepared for*

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

*Prepared by*

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

Project Number: CHA8500B

October 17, 2023

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## ACRONYMS AND ABBREVIATIONS

CCR	coal combustion residuals
CFR	Code of Federal Regulations
GWPS	groundwater protection standard
LCL	lower confidence limit
LF	Landfill
mg/L	milligrams per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency



## 1. INTRODUCTION

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (Code of Federal Regulations [CFR] Title 40, Section 257, Subpart D), groundwater monitoring has been conducted at the Landfill (LF), an existing CCR unit at the Flint Creek Power Plant in Gentry, Arkansas. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above site-specific groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron at the LF. An alternative source was not identified following the detection monitoring event, so the LF has been in assessment monitoring since 2018. An annual sampling event for Appendix IV parameters required by 40 CFR 257.95(b) was completed in March 2023, and a semiannual sampling event for Appendix III parameters and Appendix IV parameters, as required by 40 CFR 257.95(d)(1), was completed in June 2023. The results of the March and June 2023 assessment sampling events are documented in this report.

Before the statistical analyses were conducted, 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 that would impact data usability were identified.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated from the Appendix IV parameter data at the compliance wells to assess whether any were present at statistically significant levels (SSLs) above the corresponding GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Therefore, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

## 2. LANDFILL EVALUATION

### 2.1 Data Validation and QA/QC

During the 2023 assessment monitoring program through June, two sets of samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(b) (March 2023) and 257.95(d)(1) (June 2023). A sample could not be collected from downgradient well B-11 in June 2023 because the well was dry. Samples from March 2023 were analyzed for all Appendix IV parameters, whereas samples from the June 2023 sample event were analyzed for all Appendix IV and Appendix III parameters. A summary of data collected during this assessment monitoring event is presented in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program–certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas v.9.6.35 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues that would impact data usability were noted.

### 2.2 Statistical Analysis

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

The data obtained in March and June 2023 were screened for potential outliers. No outliers were identified in either set of data (Attachment B).

#### 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, nonparametric confidence limits were calculated in some cases (e.g., when the data were not normally distributed or when the nondetect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) was above the GWPS (i.e., if the entire confidence interval was above the GWPS). The calculated confidence limits (Attachment B) were compared to the GWPSs provided in Table 2. The GWPSs were established during a previous statistical analysis as either (a) the background concentration or (b) the maximum contaminant level and risk-based levels specified in 40 CFR 257.95(h)(2), whichever was greater (Geosyntec 2023).

No SSLs were identified at the LF.

### 2.2.2 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the June 2023 assessment monitoring event from each compliance well were compared to previously established prediction limits to assess whether the results were statistically above background limits. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) were noted:

- Boron concentrations were above the interwell UPL of 0.107 milligrams per liter (mg/L) at B-2 (0.205 mg/L).
- Sulfate concentrations were above the intrawell UPL of 202 mg/L at B-2 (292 mg/L), the intrawell UPL of 41.0 mg/L at B-6 (47.5 mg/L), and the intrawell UPL of 37.6 mg/L at B-9 (42.7 mg/L).
- The total dissolved solids (TDS) concentration at B-2 (560 mg/L) was above the intrawell UPL of 488 mg/L.

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the June 2023 sample was above the UPL or, in the case of pH, below the lower prediction limit. Based on this evaluation, concentrations of Appendix III constituents appear to be above background concentrations, and the unit will remain in assessment monitoring.

## 2.3 Conclusions

Annual and semiannual assessment monitoring events were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified no potential outliers in the March 2023 and June 2023 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPSs. No SSLs were identified. Appendix III parameters were compared to prediction limits; concentrations of boron, sulfate, and TDS were identified above the prediction limits.

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

### 3. REFERENCES

Geosyntec. 2020. *Statistical Analysis Plan – Amos Plant*. Geosyntec Consultants, Inc. October.

Geosyntec. 2023. *Statistical Analysis Summary – Landfill, Flint Creek Plant, Gentry, Arkansas*. Geosyntec Consultants, Inc. January.

# TABLES

**Table 1. Groundwater Data Summary  
Statistical Analysis Summary  
Flint Creek Plant - Landfill**

Parameter	Unit	B-1B		B-2		B-4		B-5		B-6		B-7A	
		3/7/2023	6/20/2023	3/6/2023	6/19/2023	3/6/2023	6/19/2023	3/7/2023	6/20/2023	3/6/2023	6/19/2023	3/6/2023	6/19/2023
Antimony	µg/L	0.10 U1	0.034 J1	0.05 J1	0.028 J1	0.10 U1	0.013 J1	0.10 U1	0.059 J1	0.04 J1	0.022 J1	0.10 U1	0.021 J1
Arsenic	µg/L	0.22	0.42	0.28	0.42	0.03 J1	0.12	0.26	0.36	0.19	0.29	9.74	9.44
Barium	µg/L	108	108	46.9	208	41.1	49.8	17.6	21.4	48.4	50.4	48.6	51.6
Beryllium	µg/L	0.042 J1	0.028 J1	0.106	0.155	0.246	0.081	0.434	0.514	0.042 J1	0.038 J1	0.038 J1	0.012 J1
Boron	mg/L	--	0.012 J1	--	0.205	--	0.019 J1	--	0.007 J1	--	0.034 J1	--	0.011 J1
Cadmium	µg/L	0.012 J1	0.016 J1	0.029	0.046	0.030	0.028	0.162	0.223	0.011 J1	0.019 J1	0.017 J1	0.005 J1
Calcium	mg/L	--	82.4	--	32.7	--	38.1	--	15.2	--	56.2	--	85.3 M1
Chloride	mg/L	--	2.58	--	5.88	--	5.29	--	9.66	--	6.23	--	3.18
Chromium	µg/L	0.30	0.42	1.54	1.52	1.0	0.91	2.41	2.38	1.66	2.17	0.31	0.38
Cobalt	µg/L	0.021	0.165	0.295	0.291	0.041	0.10	0.220	0.244	0.114	0.253	0.944	0.704
Combined Radium	pCi/L	3.32	7.83	1.60	1.59	1.85	0.75	1.38	5.48	1.30	1.16	3.57	2.72
Fluoride	mg/L	0.35	0.36	0.08	0.06	0.06 U1	0.06 U1	0.05 J1	0.05 J1	0.06 U1	0.06 U1	0.17	0.18
Lead	µg/L	0.11 J1	0.35	0.29	0.33	0.20 U1	0.14 J1	0.52	0.20	0.28	0.31	0.17 J1	0.07 J1
Lithium	mg/L	0.0249	0.0246	0.00103	0.0021	0.00106	0.0007	0.00214	0.0022	0.00032	0.0003 U1	0.0178	0.0171
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.002 J1	0.005 U1	0.005 U1	0.004 J1	0.013	0.005 U1	0.005 U1	0.003 J1	0.002 J1
Molybdenum	µg/L	0.9	1.3	1.4	0.6	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.2 J1	0.2 J1	0.3 J1	0.2 J1
Selenium	µg/L	0.5 U1	0.5 U1	4.20	11.3	0.40 J1	0.50	34.6	35.0	3.39	4.39	0.50 U1	0.5 U1
Sulfate	mg/L	--	20.2	--	292	--	5.0	--	257	--	47.5	--	33.2
Thallium	µg/L	0.20 U1	0.20 U1	0.20 U1	0.03 J1	0.20 U1	0.02 J1	0.20 U1	0.03 J1	0.20 U1	0.20 U1	0.20 U1	0.20 U1
Total Dissolved Solids	mg/L	--	290	--	560	--	140	--	430	--	230	--	310
pH	SU	7.11	7.10	5.68	5.40	6.43	6.23	5.68	5.26	6.32	6.18	7.14	7.38

**Table 1. Groundwater Data Summary  
Statistical Analysis Summary  
Flint Creek Plant - Landfill**

Parameter	Unit	B-9		B-10		B-11	B-12		B-13	
		3/7/2023	6/20/2023	3/7/2023	6/20/2023	3/7/2023	3/6/2023	6/19/2023	3/7/2023	6/20/2023
Antimony	µg/L	0.03 J1	0.026 J1	0.09 J1	0.108	0.10 U1	0.03 J1	0.179	0.10 U1	0.014 J1
Arsenic	µg/L	0.44	0.43	0.30	6.81	0.17	0.12	0.17	0.06 J1	0.08 J1
Barium	µg/L	158	154	86.2	85.1	135	58.0	50.9	53.8	42.3
Beryllium	µg/L	0.026 J1	0.020 J1	0.018 J1	0.047 J1	0.110	0.031 J1	0.034 J1	0.046 J1	0.085
Boron	mg/L	--	0.013 J1	--	0.016 J1	--	--	0.013 J1	--	0.009 J1
Cadmium	µg/L	0.009 J1	0.008 J1	0.027	0.024	0.042	0.023	0.022	0.028	0.034
Calcium	mg/L	--	80.0	--	72.8	--	--	54.5	--	10.9
Chloride	mg/L	--	5.71	--	11.4	--	--	8.25	--	1.57
Chromium	µg/L	1.02	0.95	0.70	1.71	0.67	0.59	1.17	0.64	0.63
Cobalt	µg/L	0.133	0.086	0.077	0.381	0.094	3.03	0.666	0.046	0.106
Combined Radium	pCi/L	1.18	0.77	1.21	0.78	0.95	0.71	2.00	0.69	0.81
Fluoride	mg/L	0.07	0.06	0.07	0.19	0.04 J1	0.02 J1	0.05 J1	0.06 U1	0.06 U1
Lead	µg/L	0.13 J1	0.11 J1	0.12 J1	0.27	0.08 J1	0.07 J1	0.23	0.08 J1	0.10 J1
Lithium	mg/L	0.00386	0.0029	0.00149	0.0022	0.00068	0.00108	0.0012	0.00050	0.0006
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	0.2 J1	0.3 J1	0.7	2.0	0.5 U1	0.2 J1	0.7	0.1 J1	0.5 U1
Selenium	µg/L	0.40 J1	0.49 J1	0.41 J1	0.27 J1	2.33	0.16 J1	0.14 J1	0.31 J1	0.30 J1
Sulfate	mg/L	--	42.7	--	27.7	--	--	15.7	--	17.7
Thallium	µg/L	0.2 U1	0.02 J1	0.2 U1	0.02 J1	0.2 U1	0.2 U1	0.02 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	--	300	--	280	--	--	240	--	80
pH	SU	6.74	6.97	6.71	6.72	6.33	6.54	6.63	5.50	6.20

Notes:

µg/L: micrograms per liter

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

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

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

--: Not sampled

**Table 2. Appendix IV Groundwater Protection Standards  
Statistical Analysis Summary  
Flint Creek Plant - Landfill**

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.00500	0.00600
Arsenic, Total (mg/L)	0.0100		0.00800	0.0100
Barium, Total (mg/L)	2.00		0.131	2.00
Beryllium, Total (mg/L)	0.00400		0.00100	0.00400
Cadmium, Total (mg/L)	0.00500		0.00100	0.00500
Chromium, Total (mg/L)	0.100		0.00600	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00500	0.00600
Combined Radium, Total (pCi/L)	5.00		8.79	8.79
Fluoride, Total (mg/L)	4.00		1.00	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00500	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0410	0.0410
Mercury, Total (mg/L)	0.00200		0.0005000	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.0100	0.100
Selenium, Total (mg/L)	0.0500		0.0392	0.0500
Thallium, Total (mg/L)	0.00200		0.00200	0.00200

Notes:

1. Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
2. Gray cells indicate the GWPS is based upon calculated UTL, which is higher than the MCL or CCR Rule-Specified value.

CCR: Coal Combustion Residuals

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

mg/L: milligrams per liter

pCi/L: picocuries per liter



**Table 3. Appendix III Data Summary  
Statistical Analysis Summary  
Flint Creek Plant - Landfill**

Analyte	Unit	Description	B-2	B-6	B-9	B-10
			6/19/2023	6/19/2023	6/20/2023	6/20/2023
Boron	mg/L	Interwell Background Value (UPL)	0.107			
		Analytical Result	<b>0.205</b>	0.034	0.013	0.016
Calcium	mg/L	Intrawell Background Value (UPL)	53.6	58.8	134	116
		Analytical Result	32.7	56.2	80.0	72.8
Chloride	mg/L	Intrawell Background Value (UPL)	9.19	8.54	8.07	11.7
		Analytical Result	5.88	6.23	5.71	11.4
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	1.00	1.00	1.00
		Analytical Result	0.06	0.02	0.06	0.19
pH	SU	Intrawell Background Value (UPL)	7.1	7.3	8.2	8.5
		Intrawell Background Value (LPL)	5.2	6.1	6.3	6.2
		Analytical Result	5.4	6.2	7.0	6.7
Sulfate	mg/L	Intrawell Background Value (UPL)	202	41.0	37.6	36.7
		Analytical Result	<b>292</b>	<b>47.5</b>	<b>42.7</b>	27.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	488	279	307	304
		Analytical Result	<b>560</b>	230	300	280

Notes:

**1. Bold values exceed the background value.**

2. Background values are shaded gray.

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

# ATTACHMENT A

## Certification by Qualified Professional Engineer

### Certification by Qualified Professional Engineer

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

David Anthony Miller

Printed Name of Licensed Professional Engineer

*David Anthony Miller*

Signature



15296

License Number

Arkansas

Licensing State

10.18.2023

Date

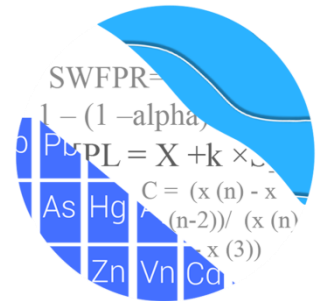
# **ATTACHMENT B**

## Statistical Analysis Output

# GROUNDWATER STATS CONSULTING

September 14, 2023

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



Re: Flint Creek Landfill  
Assessment Monitoring Summary – March & June 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the Assessment Monitoring statistical analysis of groundwater data through June 2023 at American Electric Power Company's Flint Creek Landfill. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

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

- **Upgradient wells:** B-1B, B-4, B-5, B-7A, B-12, and B-13
- **Downgradient wells:** B-2, B-6, B-9, B-10, and B-11

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

The CCR 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 and box plots for Appendix IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figures A and B, respectively). Values in background which have previously been flagged as outliers may be seen in a lighter font and disconnected symbol on the graphs. Additionally, a summary of flagged values follows this letter (Figure C).

Note that well B-11 did not get sampled during the June 2023 event due to an insufficient water column.

### **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, the reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory. There is no replacement of historical reporting limits with the most recent reporting limit. For several constituents, the most recent reporting limits are significantly lower than those reported historically. This is a conservative approach for tolerance limits and confidence intervals at this site.
- 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 Previous Background Updates

Background (upgradient) data sets are periodically re-evaluated for Appendix IV constituents for the purpose of updating statistical limits. This step was most recently performed in January 2023 through visual screening and Tukey's outlier test for potential outliers as well as extreme trending patterns that would lead to artificially elevated statistical limits.

While downgradient well data were also screened for outliers, high measurements are "cautiously" flagged only when the measurements are distinctly different from remaining measurements within a given well. When preceding and subsequent measurements to a single high reported concentration are significantly lower and similar, the assumption is that the increase in a single measurement is spurious and not representative of the true population of groundwater quality. 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 overall mean and thus lower the entire interval. The intent is to better represent the true mean of the population in downgradient wells. Complete findings of each background update were submitted at the time of the screenings.

During previous screenings, several metals were identified to have higher reported concentrations in multiple wells during the September and November 2016 events which appear to be either a laboratory or sampling issue. Therefore, these values were flagged as outliers since they do not represent the population within these wells. Additionally, several reporting limits for the metals are significantly lower beginning in March 2019 than those reported historically. Non-detect values were not replaced with the most recent reporting limit in order to create conservative statistical limits from a regulatory perspective. For lithium, the reporting limit during the June 2019 event increased from a historical limit of 0.001 mg/L to 0.1 mg/L. Therefore, this value was flagged in all wells as it is higher than any reported concentrations.

### Background Update – Conducted in January 2023

#### Outlier Analysis

Prior to evaluating Appendix IV parameters for the September 2022 statistical analysis, upgradient well data were re-evaluated using visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. No additional measurements were flagged. A discussion of those findings

is provided below. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Tukey's outlier test identified outliers for barium, chromium, cobalt, combined radium 226 + 228, fluoride, and lithium when pooled upgradient well data were evaluated; however, many of these values were of similar concentration to one another and were not flagged as outliers. The highest detected value for chromium in well B-12, the two highest detected values for cobalt in well B-12, and the high reporting limit for lithium at several wells during the June 2019 event remain flagged in the database as outliers as they did not appear to represent the population at these wells and do not represent current conditions.

Downgradient well data through September 2022 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 additional outliers were flagged at that time, and previously flagged outliers for barium at well B-10 were unflagged due to more recent concentrations being similar.

#### Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through September 2022 for Appendix IV parameters (Figure D). These limits are updated on an annual basis and will be updated again during the Fall 2023 sample event analysis. Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

#### Groundwater Protection Standards

The upper tolerance limits were compared to the Maximum Contaminant Levels (MCLs) and background limits 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 and June 2023

Time series plots were used to visually identify potential outliers in downgradient wells through the March and June 2023 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 additional suspected outliers were identified.

Confidence intervals were then constructed with data through June 2023 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). When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals, which use the largest and smallest order statistics depending on the sample size as interval limits, were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

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 Flint Creek Landfill. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



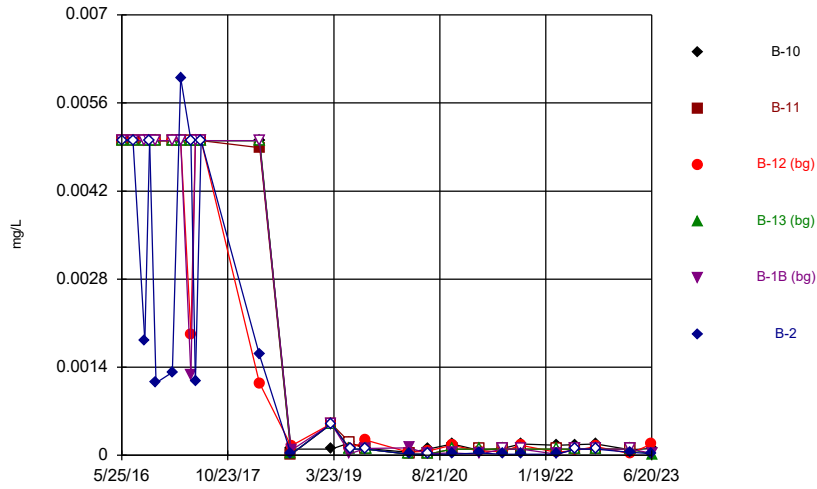
Tristan Clark  
Groundwater Analyst



Andrew Collins  
Project Manager

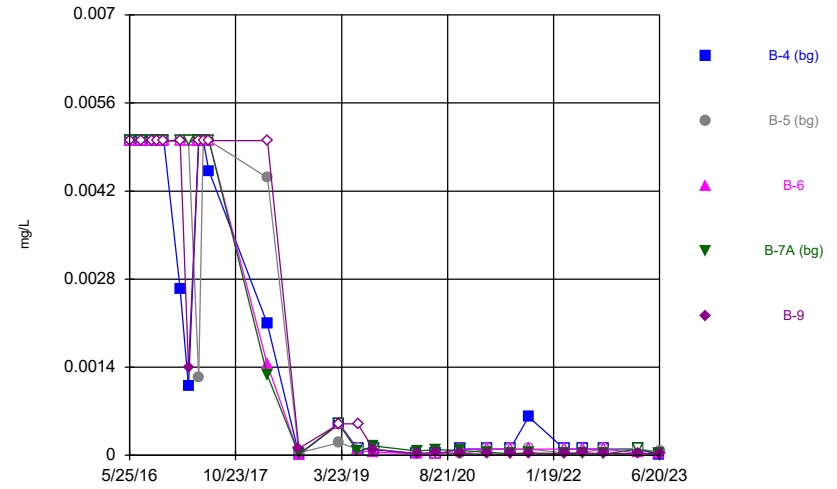
FIGURE A  
Time Series

### Time Series



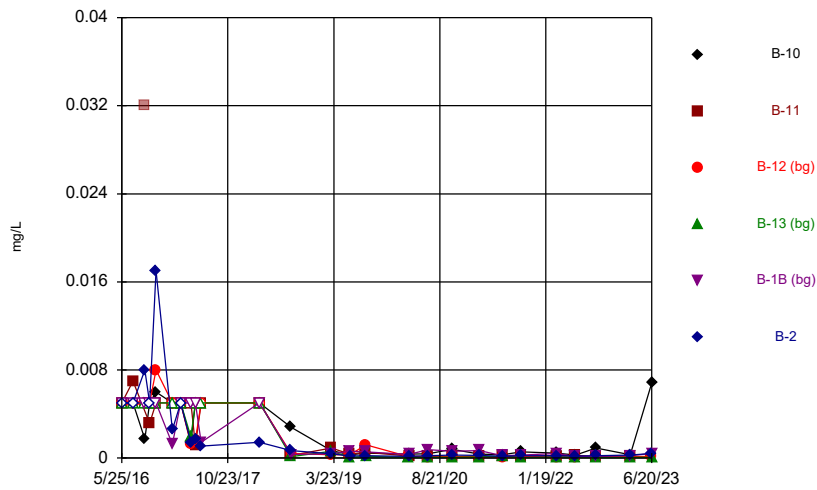
Constituent: Antimony, total Analysis Run 9/13/2023 11:45 AM View: Appendix IV  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



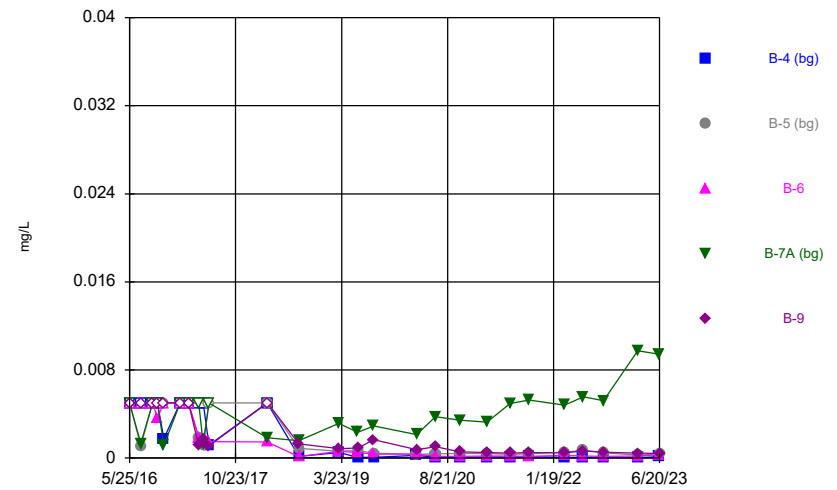
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



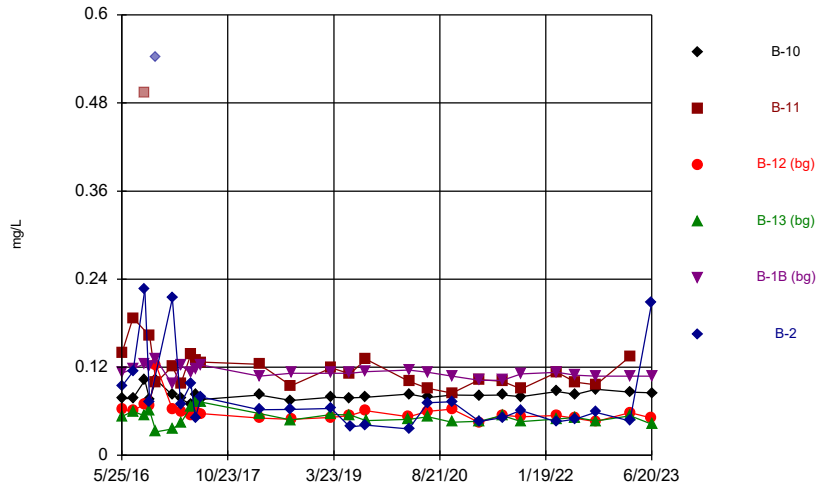
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### Time Series



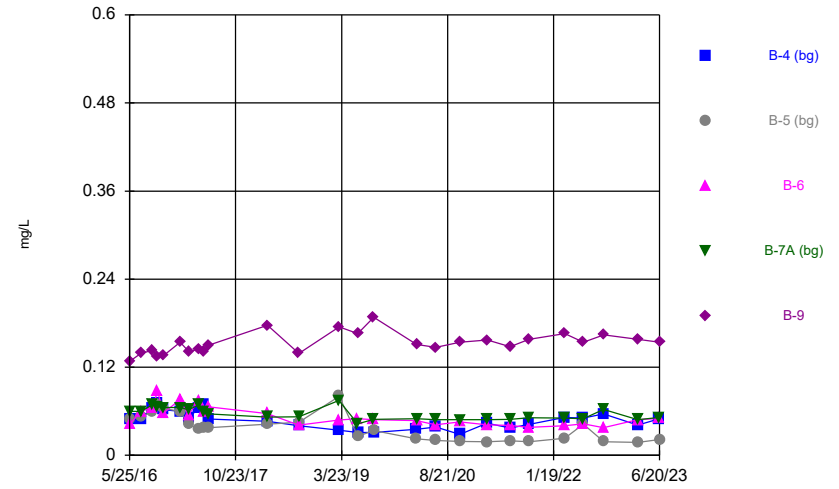
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### Time Series



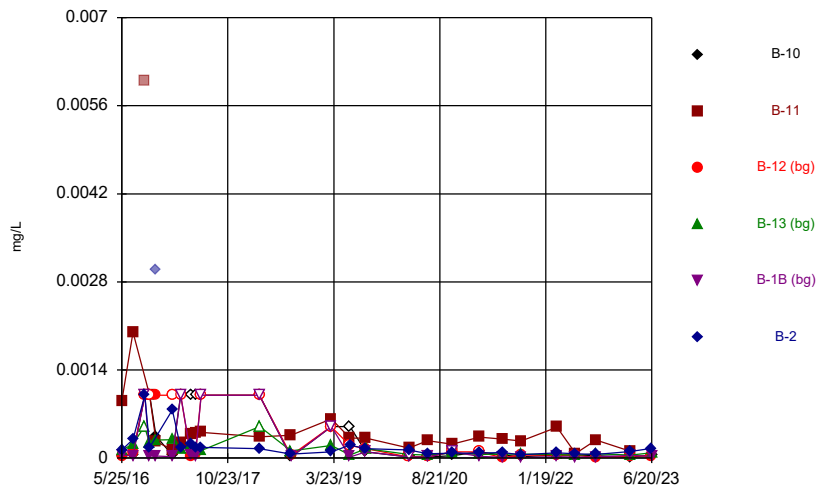
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Time Series



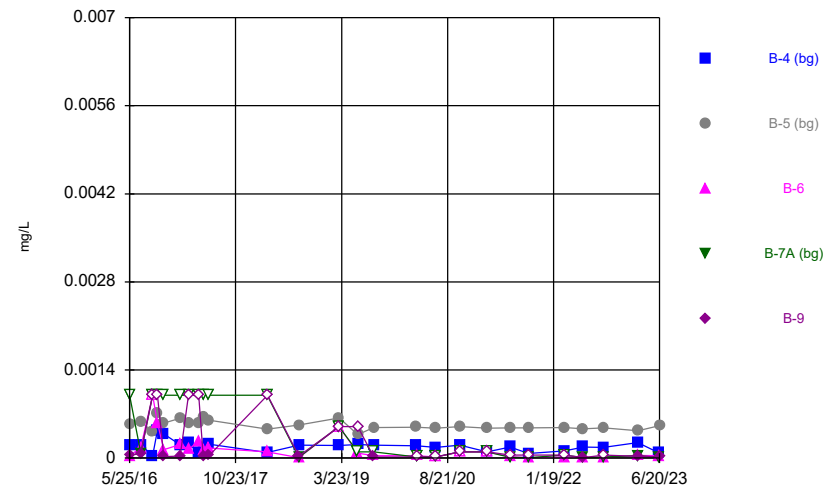
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### Time Series



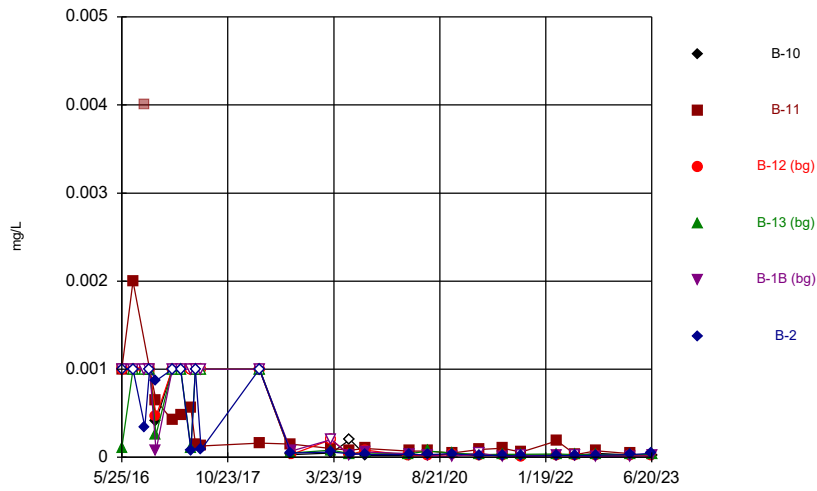
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### Time Series



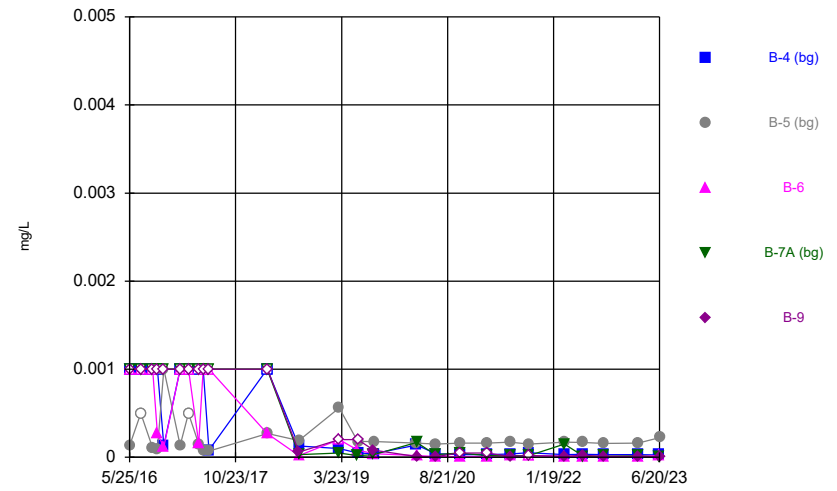
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### Time Series



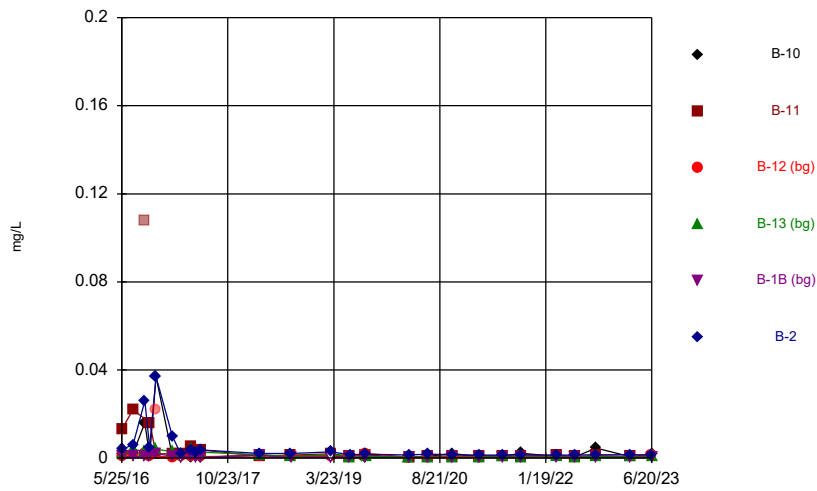
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### Time Series



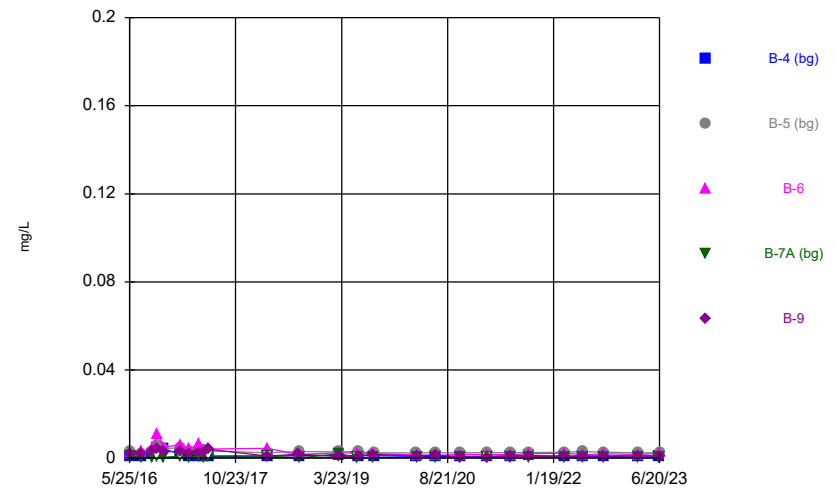
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### Time Series



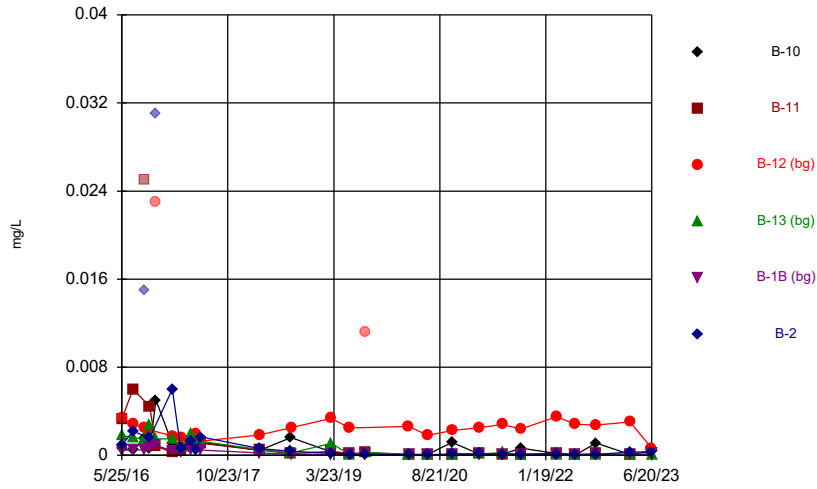
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### Time Series



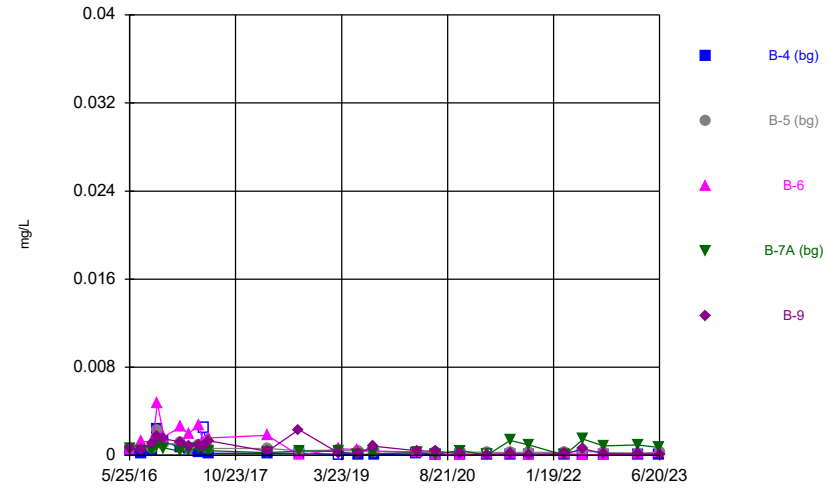
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



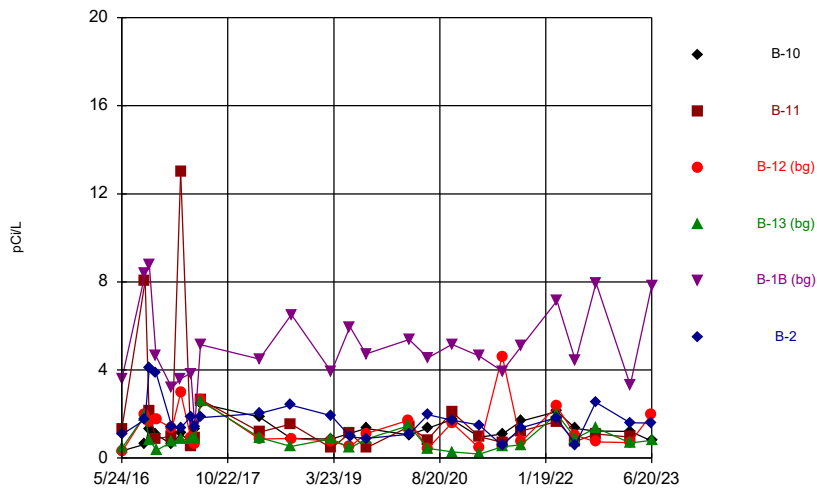
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Time Series



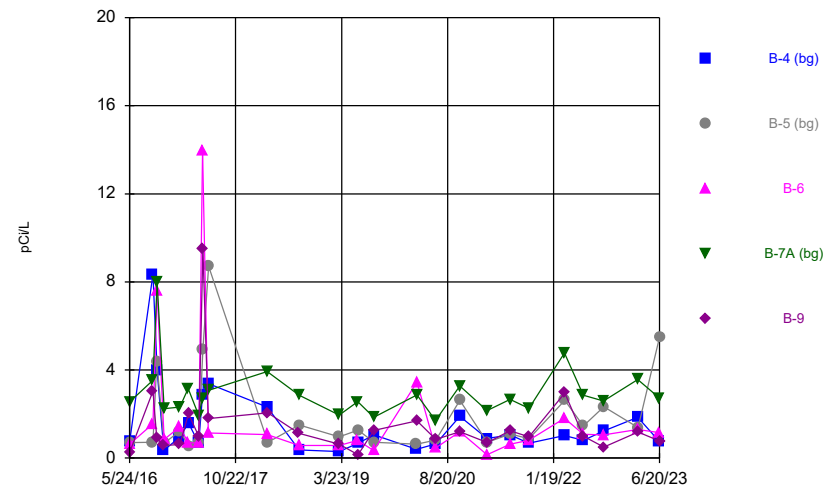
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 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



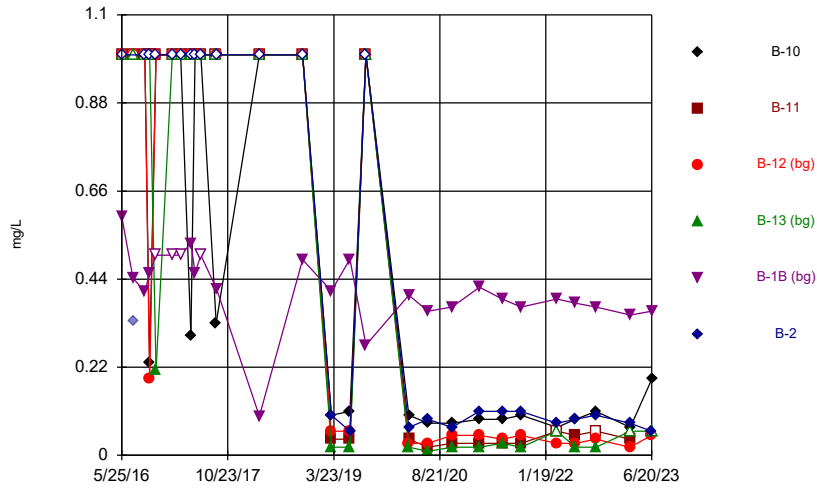
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Time Series



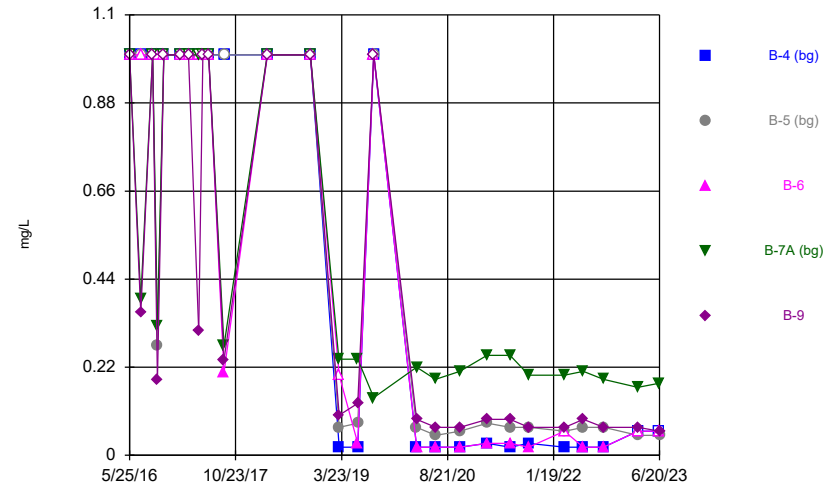
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 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



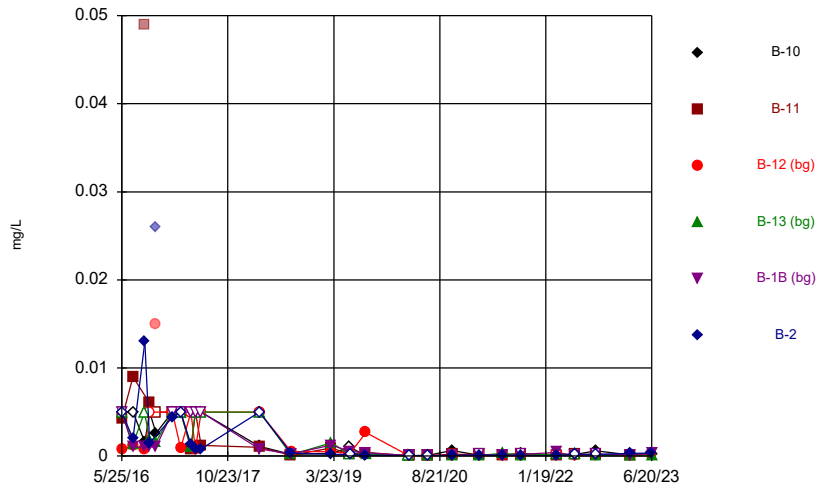
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Time Series



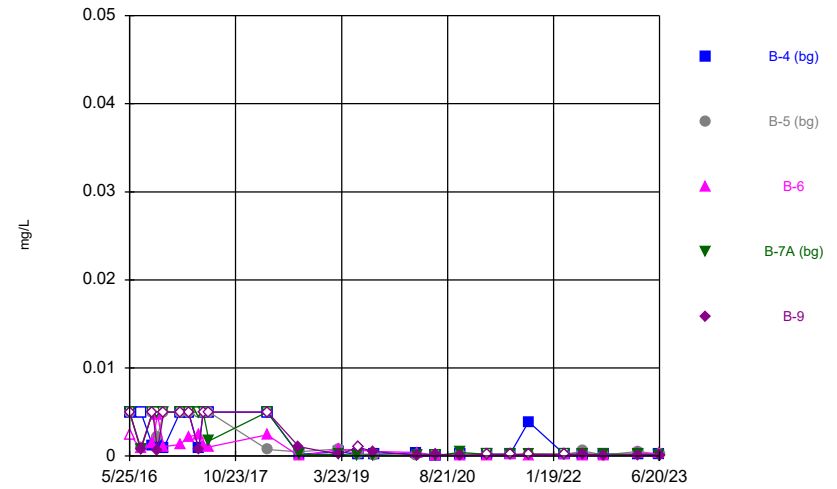
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Time Series



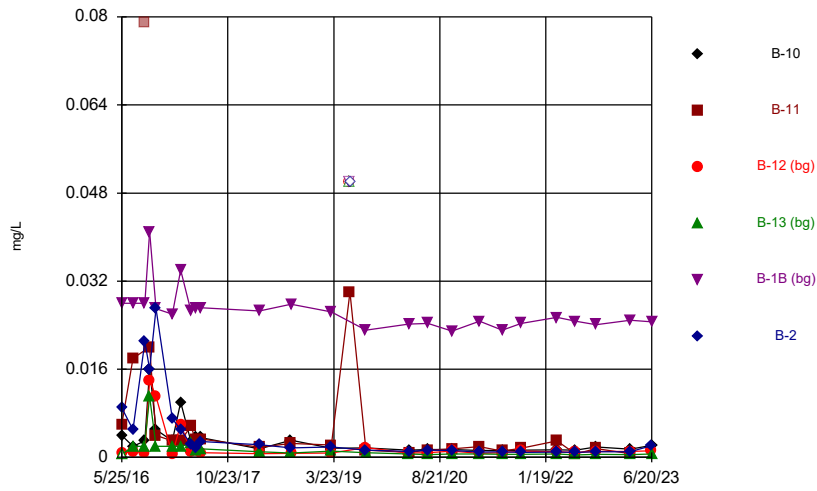
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Time Series



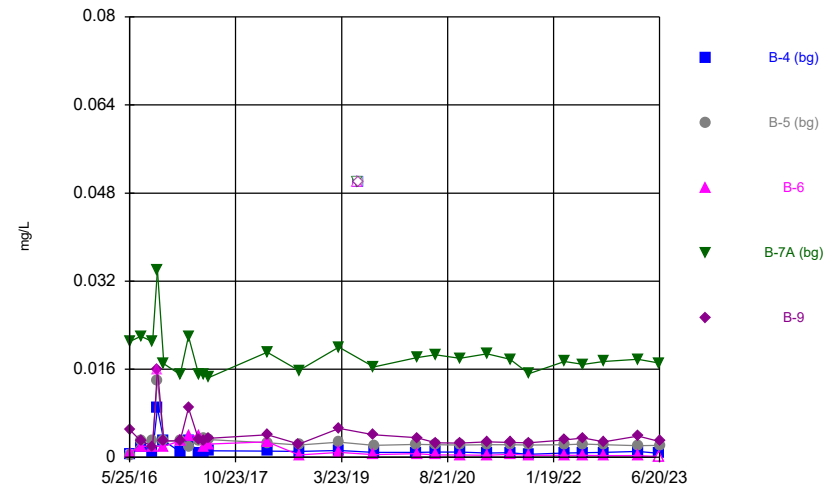
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Time Series



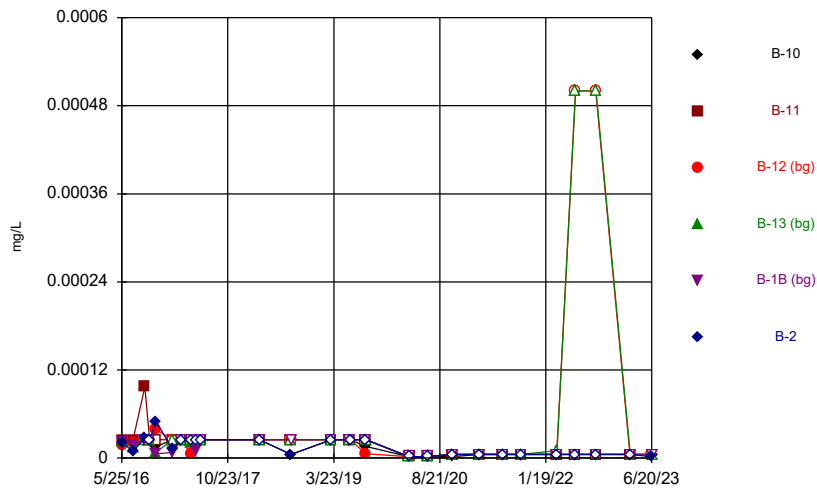
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Time Series



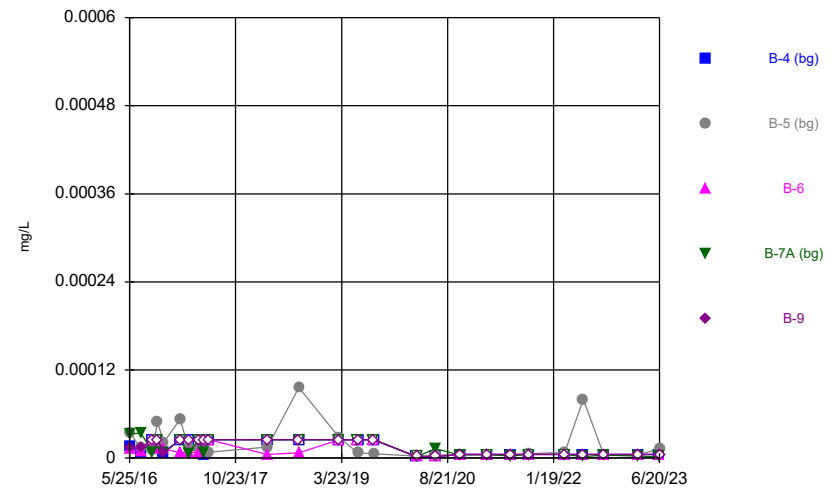
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



Constituent: Mercury, total Analysis Run 9/13/2023 11:46 AM View: Appendix IV  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

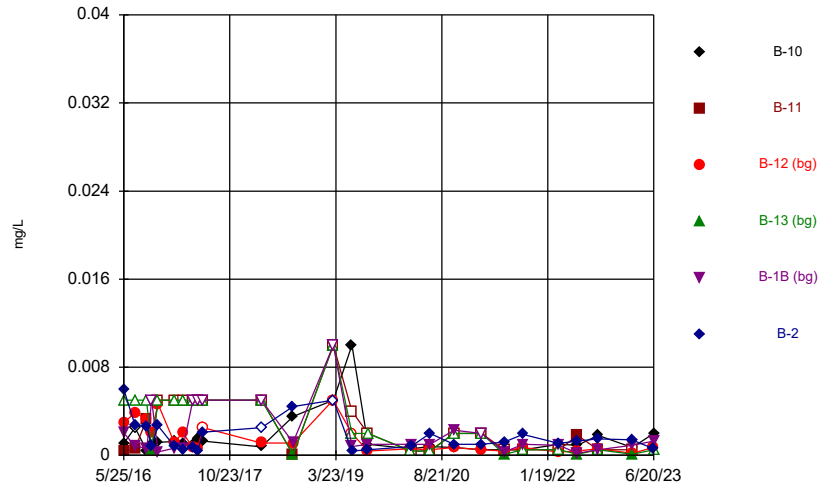
Time Series



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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

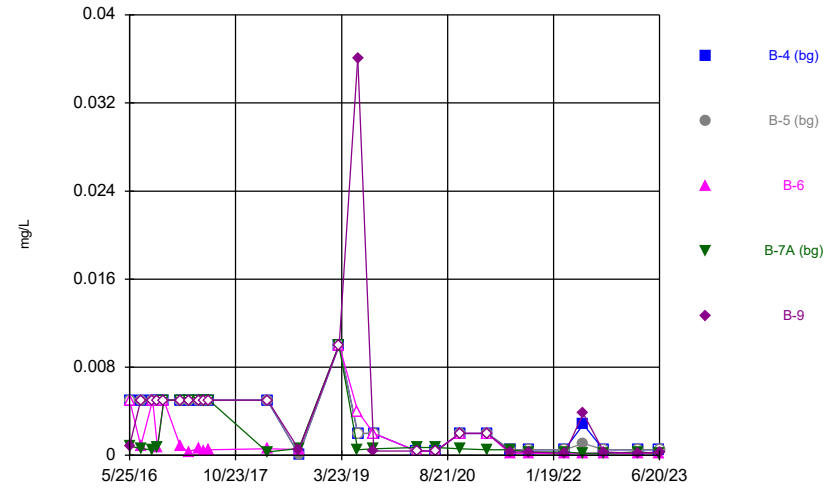


Time Series



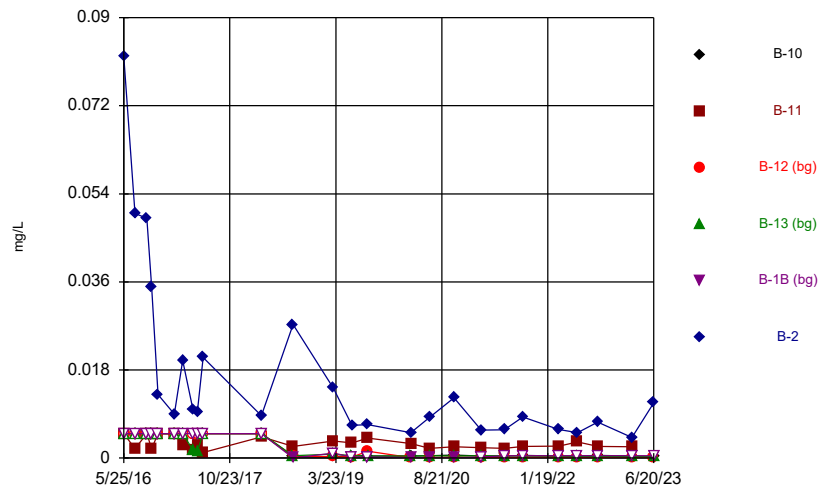
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Time Series



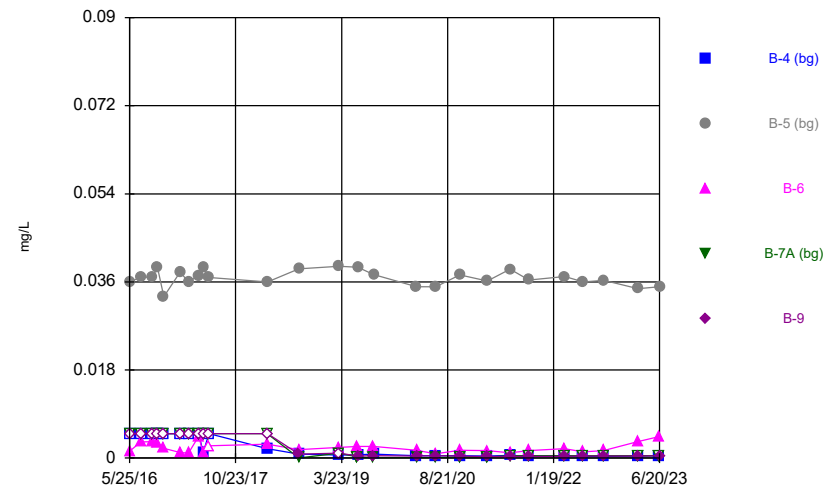
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Time Series



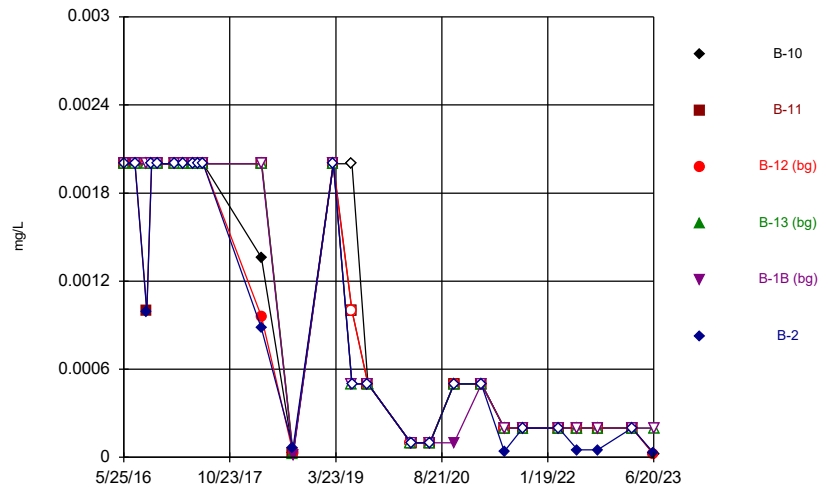
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Time Series



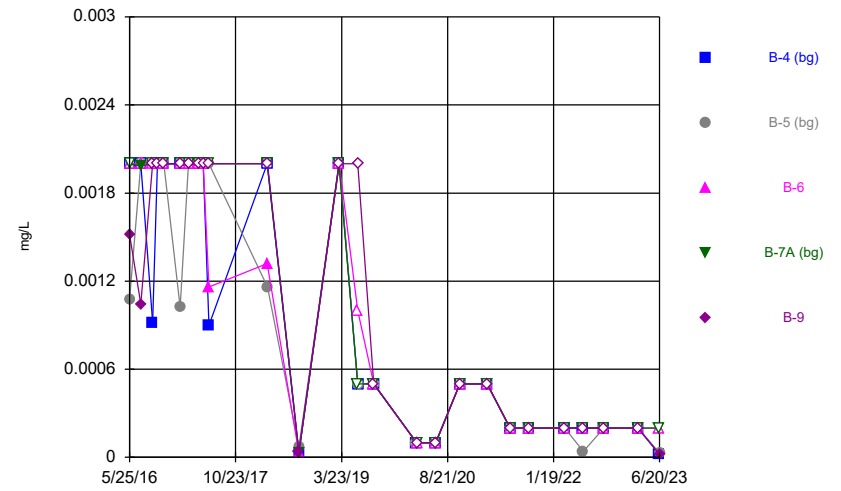
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Time Series



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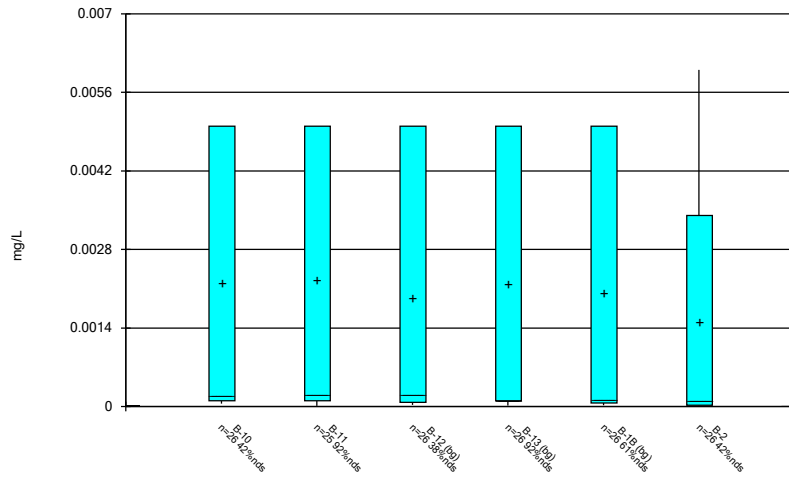
Time Series



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 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

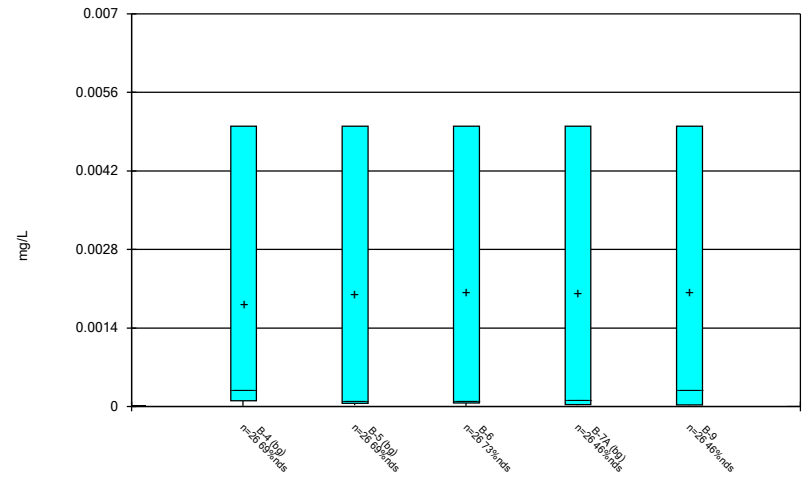
**FIGURE B**  
**Box Plots**

Box & Whiskers Plot



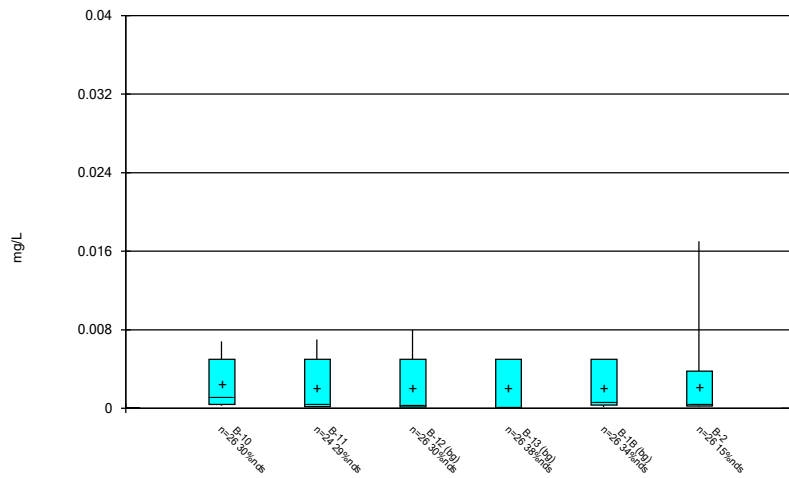
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Box & Whiskers Plot



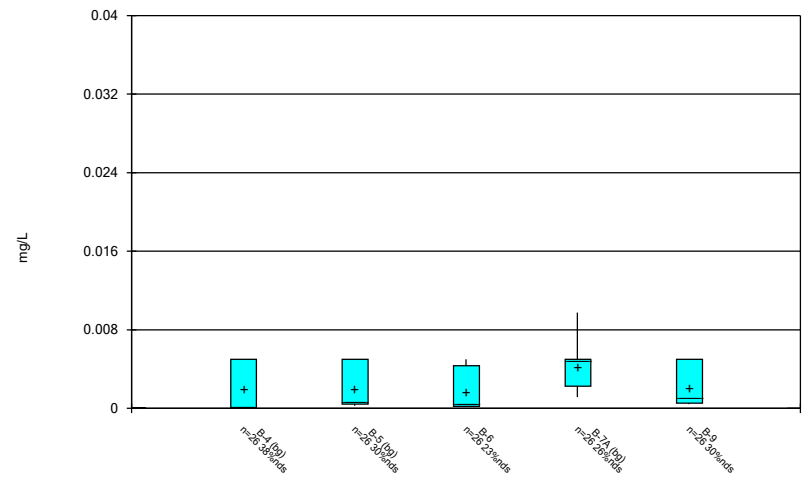
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



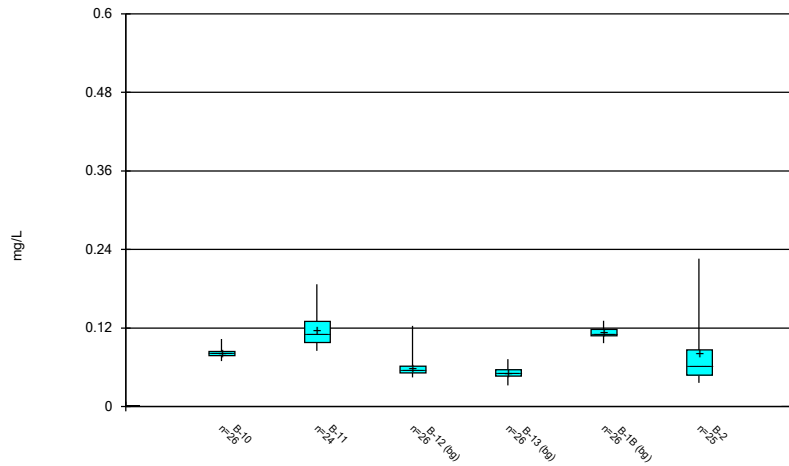
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



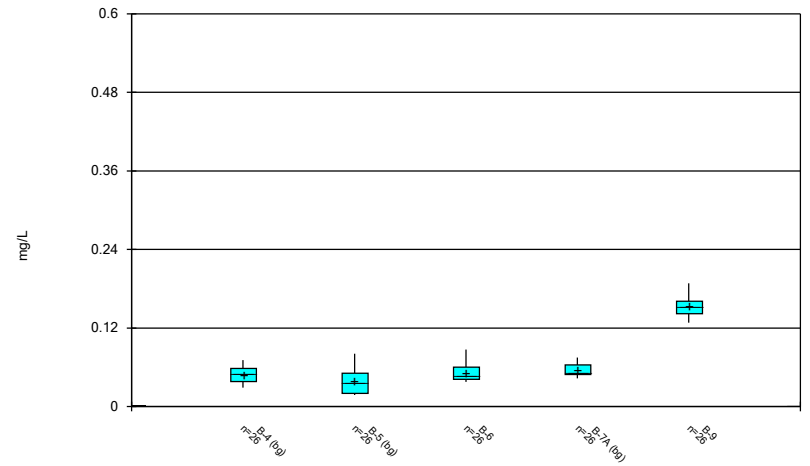
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



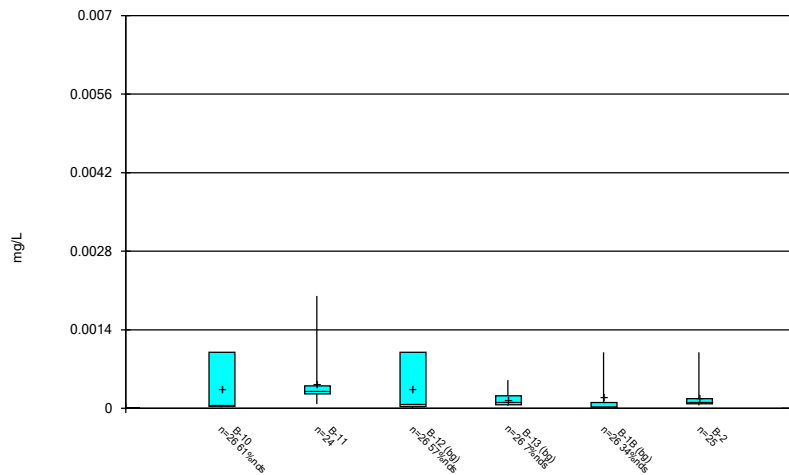
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



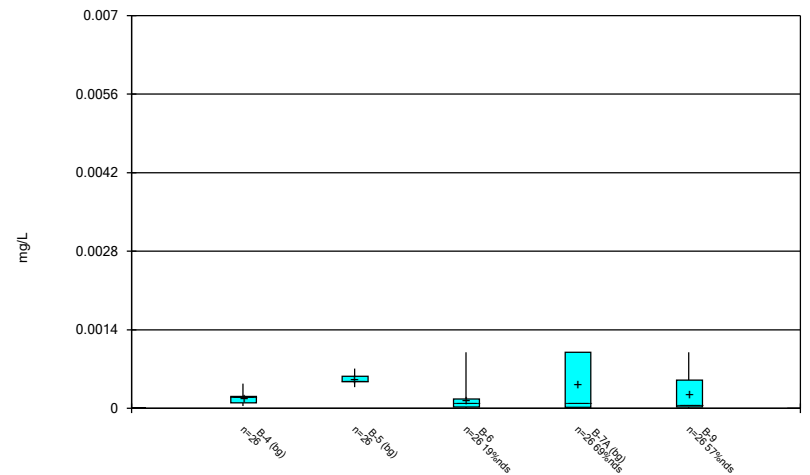
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



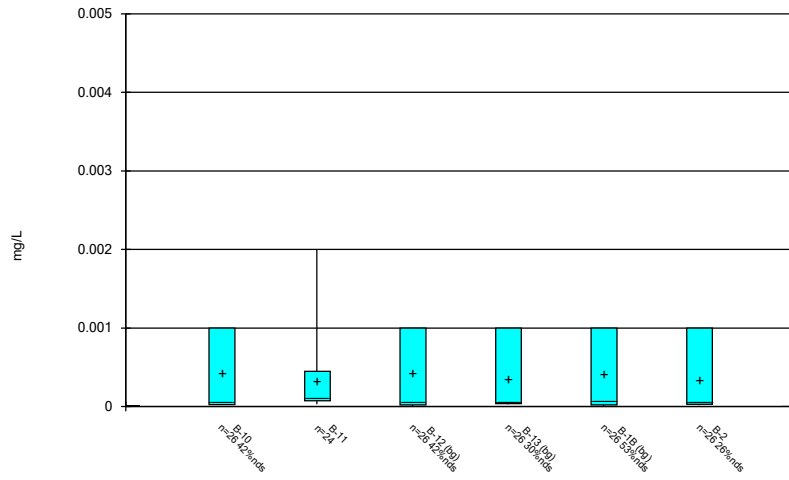
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



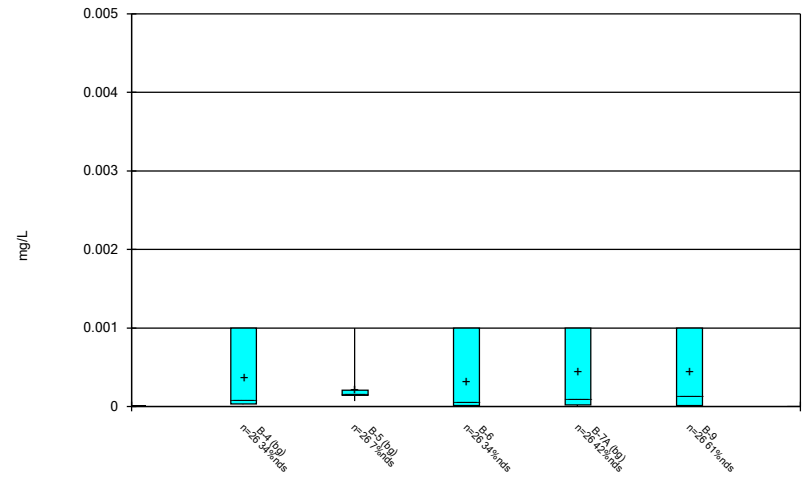
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



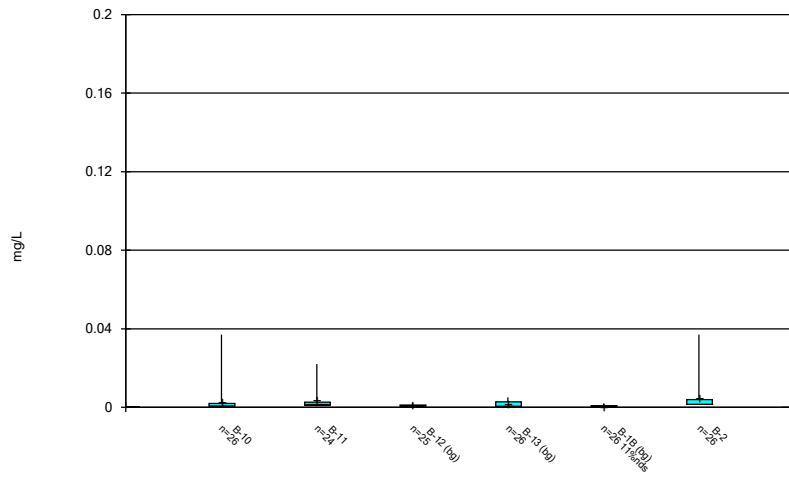
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



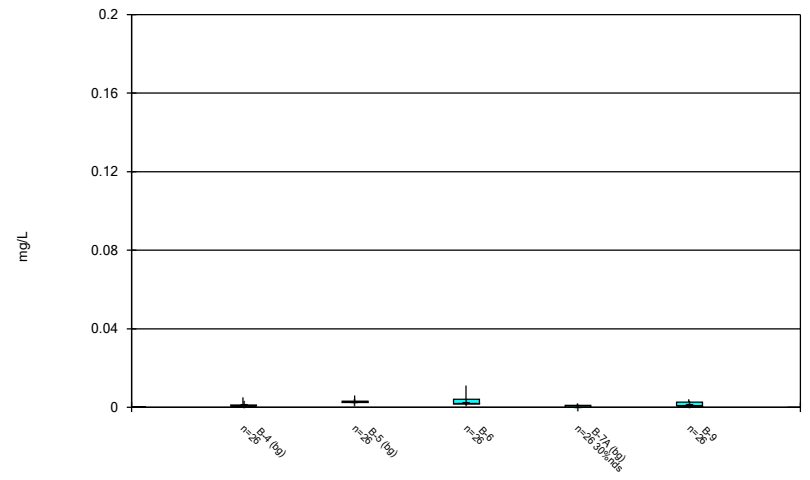
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



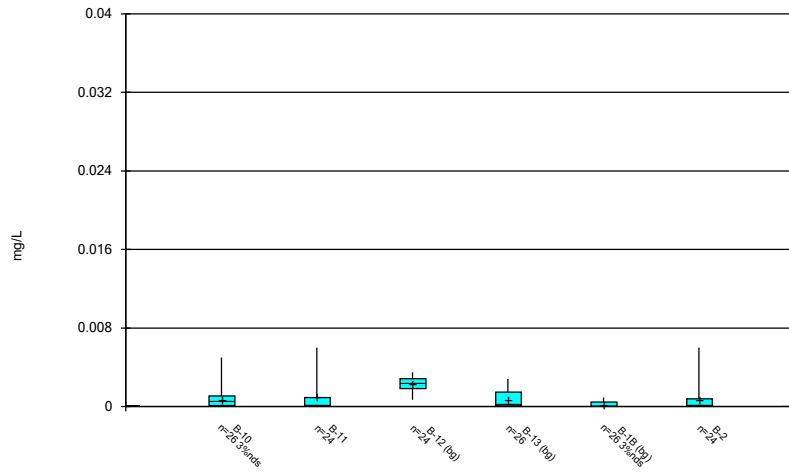
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### Box & Whiskers Plot



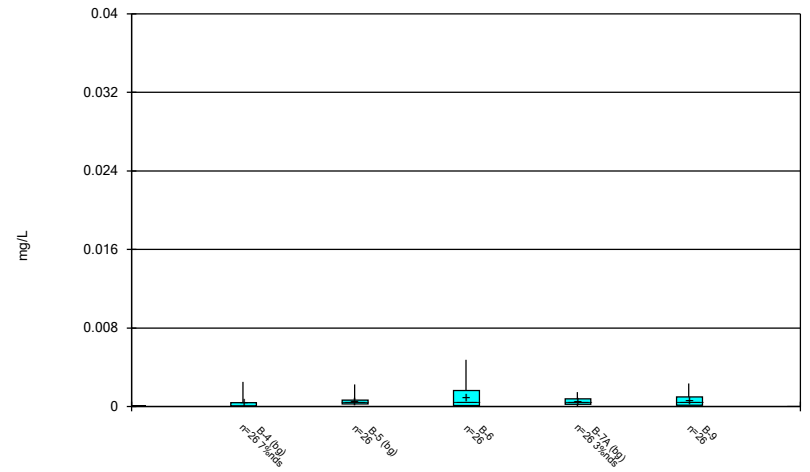
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



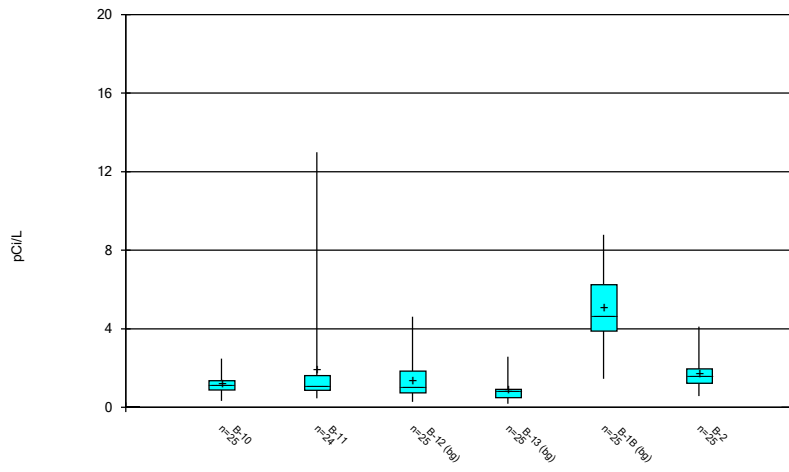
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



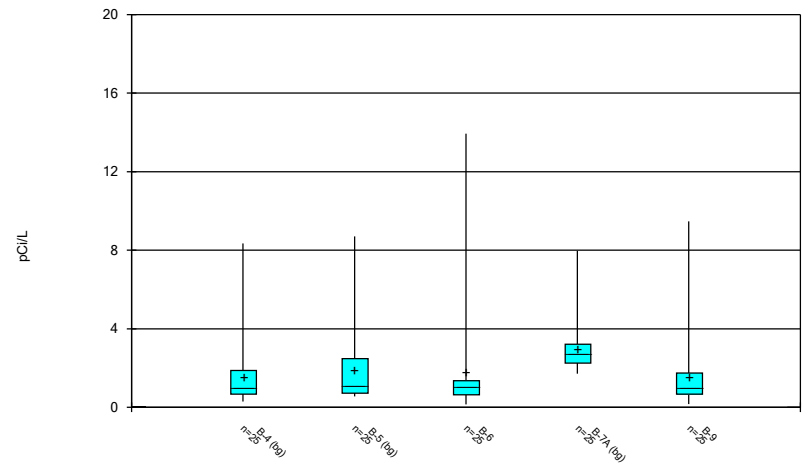
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



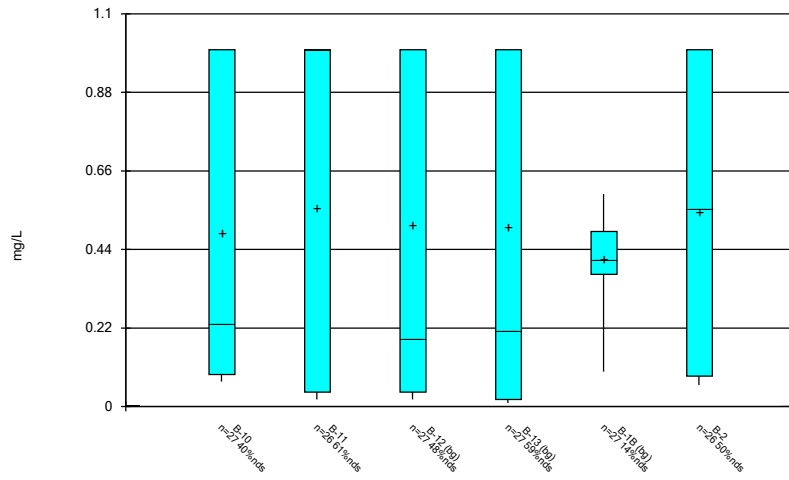
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



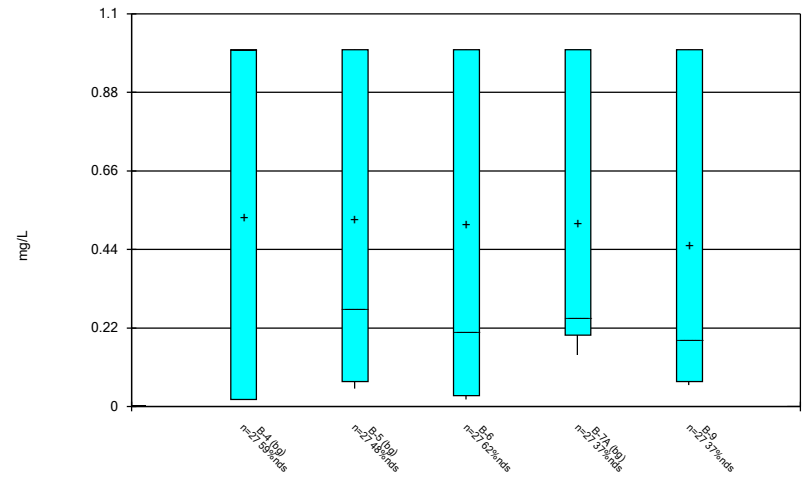
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



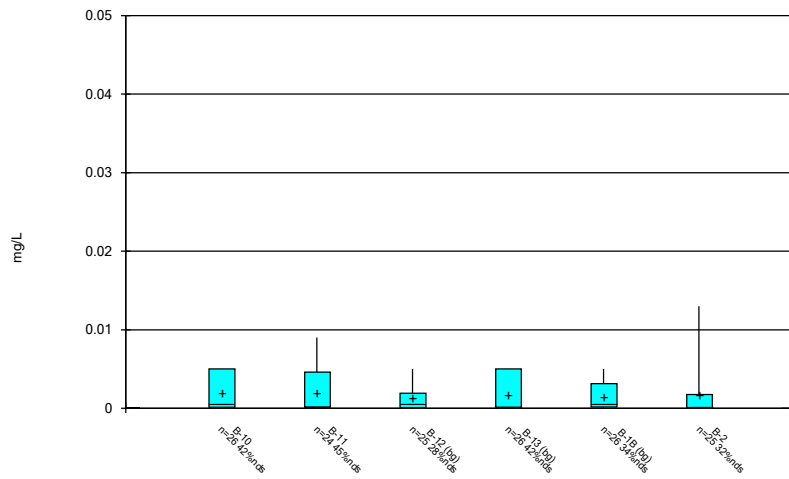
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



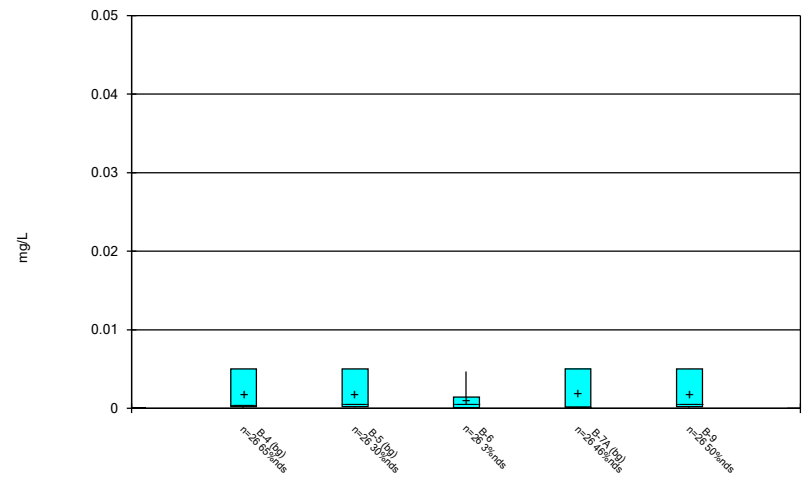
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



Constituent: Lead, total Analysis Run 9/13/2023 11:46 AM View: Appendix IV  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

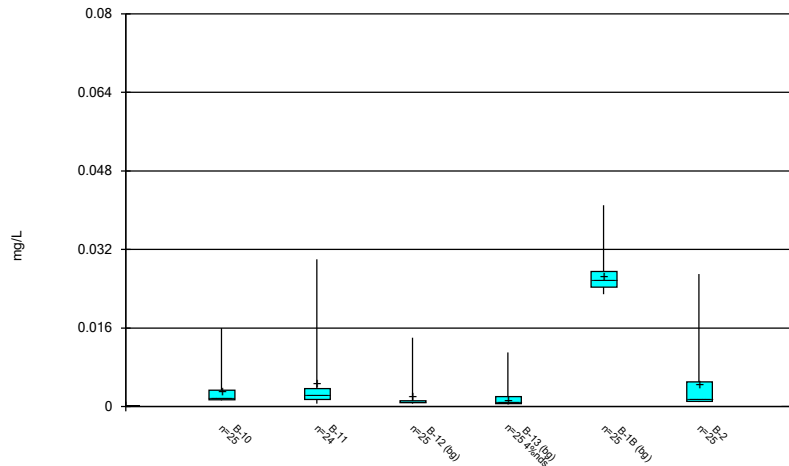
Box & Whiskers Plot



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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

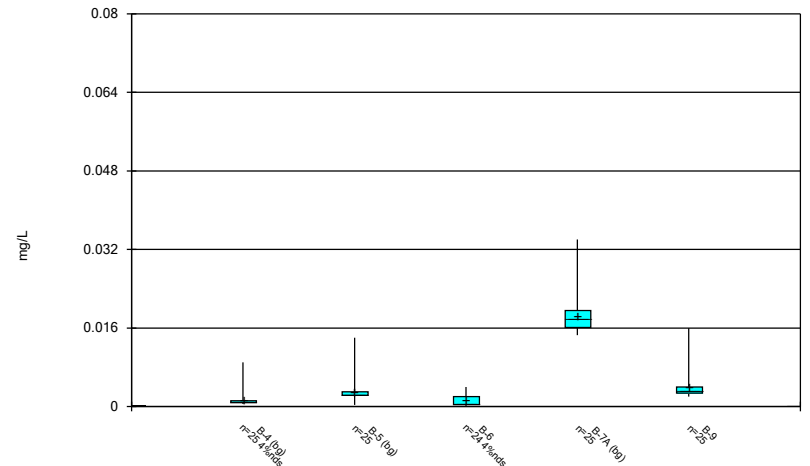


Box & Whiskers Plot



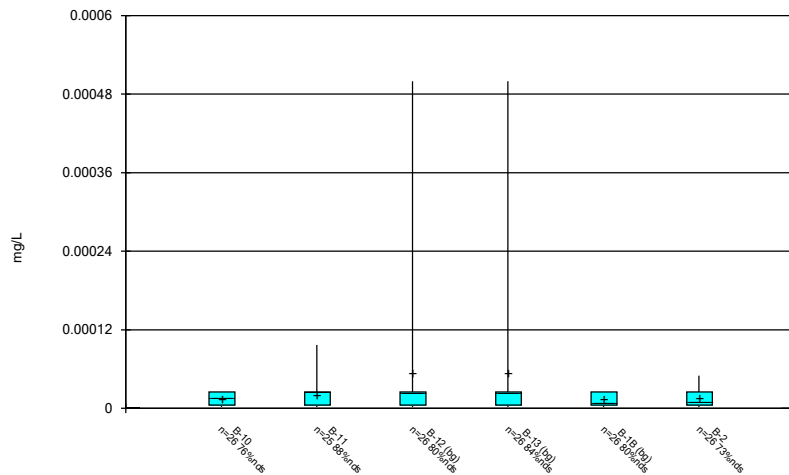
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



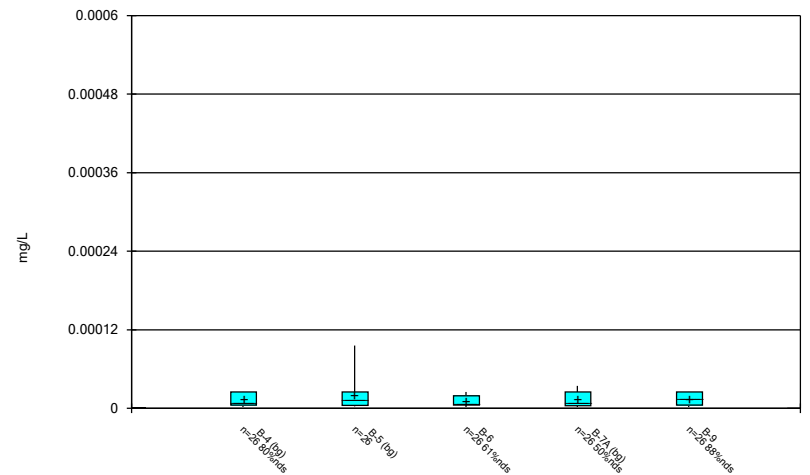
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Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



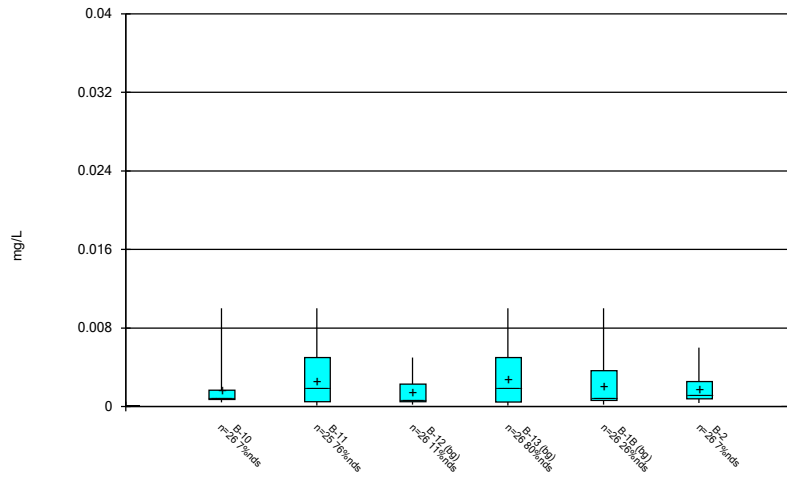
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Box & Whiskers Plot



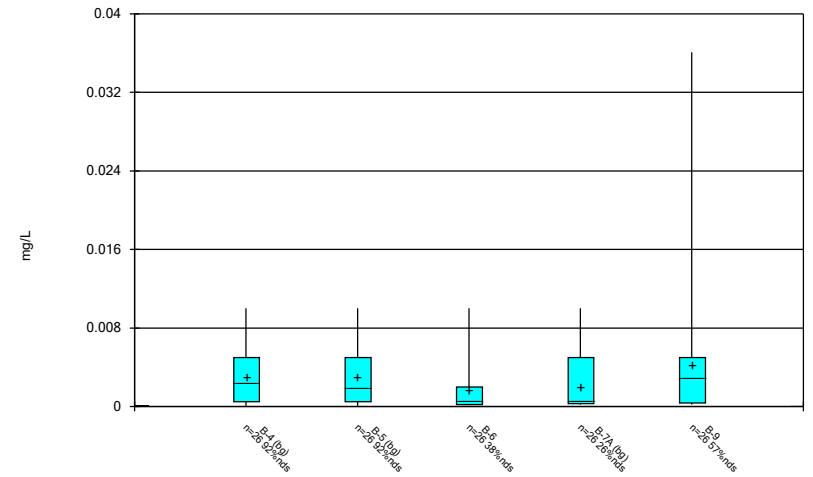
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Box & Whiskers Plot



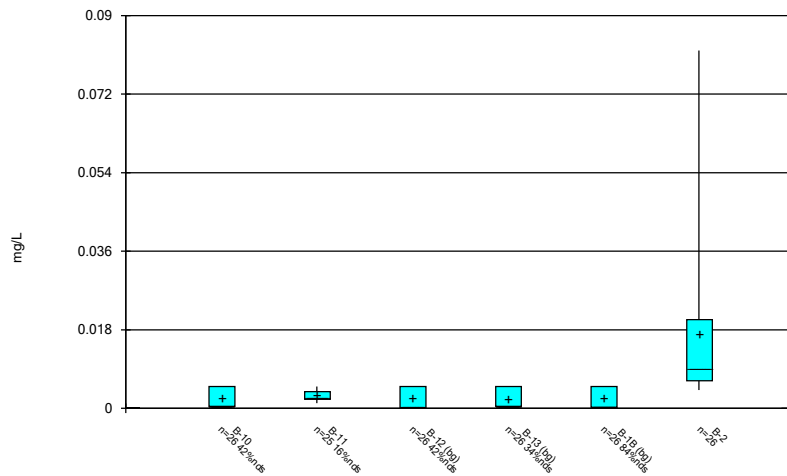
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Box & Whiskers Plot



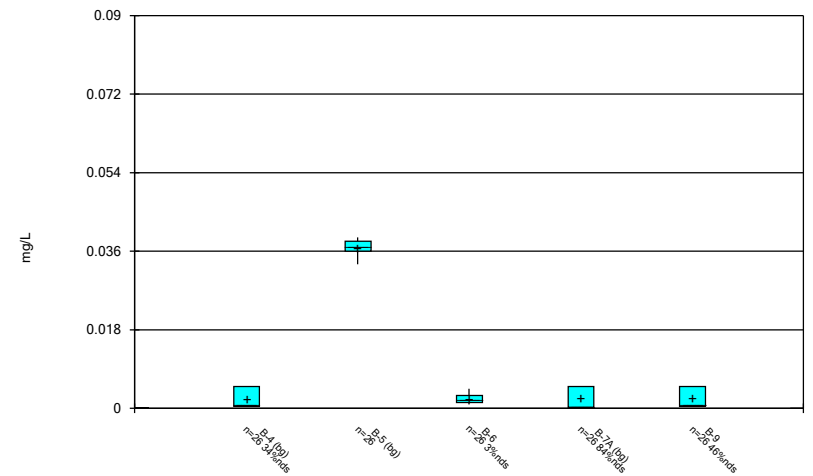
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 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



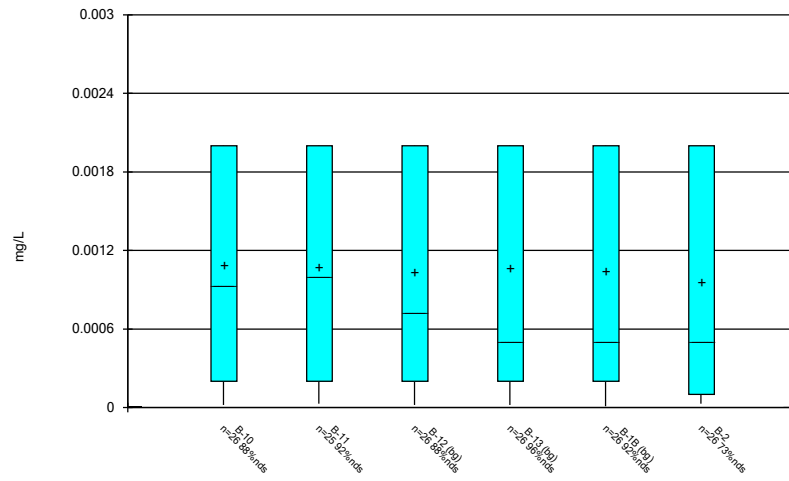
Constituent: Selenium, total Analysis Run 9/13/2023 11:47 AM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Box & Whiskers Plot



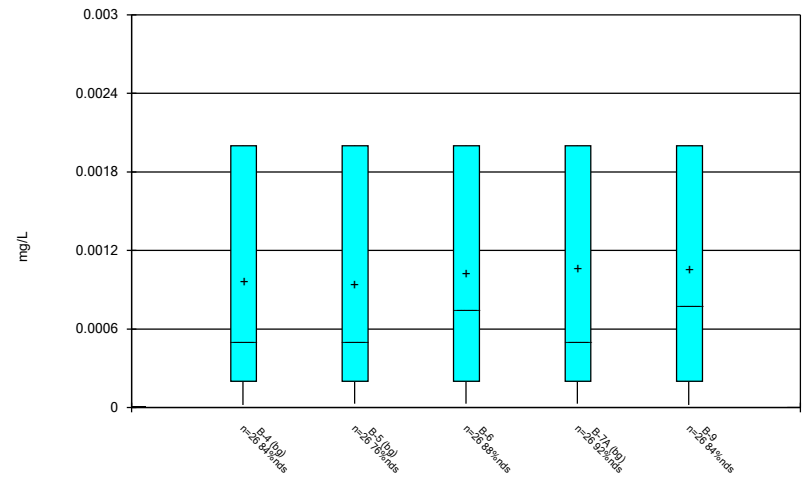
Constituent: Selenium, total Analysis Run 9/13/2023 11:47 AM View: Appendix IV  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 9/13/2023 11:47 AM View: Appendix IV  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 9/13/2023 11:47 AM View: Appendix IV  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

FIGURE C  
Outlier Summary

# Outlier Summary

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 9/13/2023, 11:47 AM

	B-11 Arsenic, total (mg/L)	B-11 Barium, total (mg/L)	B-2 Barium, total (mg/L)	B-11 Beryllium, total (mg/L)	B-2 Beryllium, total (mg/L)	B-11 Cadmium, total (mg/L)	B-11 Chromium, total (mg/L)	B-12 Chromium, total (mg/L)	B-11 Cobalt, total (mg/L)	B-12 Cobalt, total (mg/L)
7/19/2016										
9/14/2016	0.032 (o)	0.494 (o)		0.006 (o)		0.004 (o)	0.108 (o)		0.025 (o)	
10/7/2016										
11/8/2016			0.543 (o)		0.003 (o)			0.022 (o)		0.023 (o)
6/10/2019										
6/11/2019										
8/27/2019										0.0112 (o)

	B-2 Cobalt, total (mg/L)	B-2 Fluoride, total (mg/L)	B-11 Lead, total (mg/L)	B-12 Lead, total (mg/L)	B-2 Lead, total (mg/L)	B-10 Lithium, total (mg/L)	B-11 Lithium, total (mg/L)	B-12 Lithium, total (mg/L)	B-13 Lithium, total (mg/L)	B-1B Lithium, total (mg/L)
7/19/2016		0.3361 (Jo)								
9/14/2016	0.015 (o)		0.049 (o)				0.079 (o)			
10/7/2016										
11/8/2016	0.031 (o)			0.015 (o)	0.026 (o)					
6/10/2019						<0.1 (o)		<0.1 (o)	<0.1 (o)	<0.1 (o)
6/11/2019										
8/27/2019										

	B-2 Lithium, total (mg/L)	B-4 Lithium, total (mg/L)	B-5 Lithium, total (mg/L)	B-6 Lithium, total (mg/L)	B-7A Lithium, total (mg/L)	B-9 Lithium, total (mg/L)
7/19/2016						
9/14/2016						
10/7/2016				0.016 (o)		
11/8/2016						
6/10/2019				<0.1 (o)	<0.1 (o)	
6/11/2019	<0.1 (o)	<0.1 (o)	<0.1 (o)			<0.1 (o)
8/27/2019						

FIGURE D  
UTLs

# Upper Tolerance Limit Summary Table

Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 12/29/2022, 12:20 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 144	n/a	n/a	64.58	n/a	n/a	0.0006197	NP Inter(NDs)
Arsenic, total (mg/L)	n/a	0.008	n/a	n/a	n/a	n/a 144	n/a	n/a	36.11	n/a	n/a	0.0006197	NP Inter(normality)
Barium, total (mg/L)	n/a	0.131	n/a	n/a	n/a	n/a 144	n/a	n/a	0	n/a	n/a	0.0006197	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	30.56	n/a	n/a	0.0006197	NP Inter(normality)
Cadmium, total (mg/L)	n/a	0.001	n/a	n/a	n/a	n/a 144	n/a	n/a	38.19	n/a	n/a	0.0006197	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.006	n/a	n/a	n/a	n/a 143	n/a	n/a	7.692	n/a	n/a	0.0006523	NP Inter(normality)
Cobalt, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 142	n/a	n/a	2.817	n/a	n/a	0.0006867	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	n/a	8.79	n/a	n/a	n/a	n/a 138	n/a	n/a	0	n/a	n/a	0.0008431	NP Inter(normality)
Fluoride, total (mg/L)	n/a	1	n/a	n/a	n/a	n/a 150	n/a	n/a	45.33	n/a	n/a	0.0004556	NP Inter(normality)
Lead, total (mg/L)	n/a	0.005	n/a	n/a	n/a	n/a 143	n/a	n/a	44.06	n/a	n/a	0.0006523	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.041	n/a	n/a	n/a	n/a 138	n/a	n/a	1.449	n/a	n/a	0.0008431	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.0005	n/a	n/a	n/a	n/a 144	n/a	n/a	62.5	n/a	n/a	0.0006197	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.01	n/a	n/a	n/a	n/a 144	n/a	n/a	56.25	n/a	n/a	0.0006197	NP Inter(NDs)
Selenium, total (mg/L)	n/a	0.0392	n/a	n/a	n/a	n/a 144	n/a	n/a	47.92	n/a	n/a	0.0006197	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.002	n/a	n/a	n/a	n/a 144	n/a	n/a	89.58	n/a	n/a	0.0006197	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 144 background values. 64.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Antimony, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

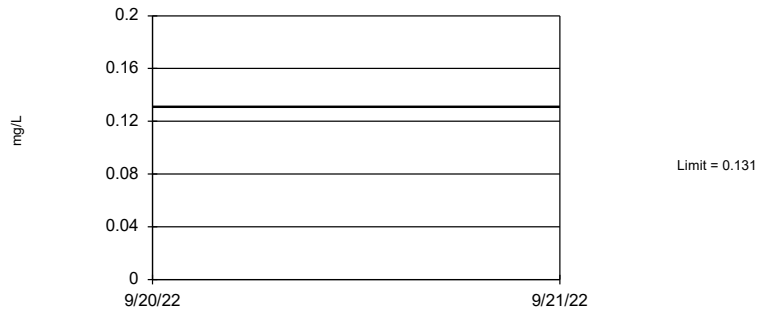
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 36.11% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Arsenic, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Barium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

Tolerance Limit  
Interwell Non-parametric

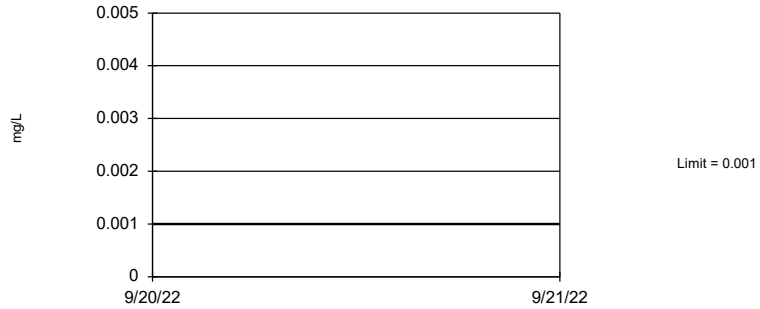


Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 30.56% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Beryllium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF



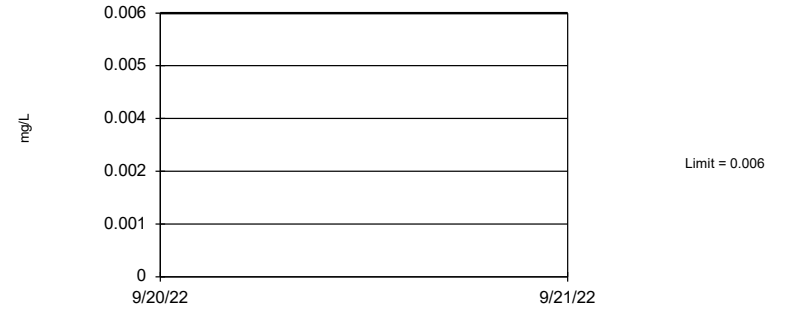
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 38.19% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Cadmium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 143 background values. 7.692% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006523.

Constituent: Chromium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

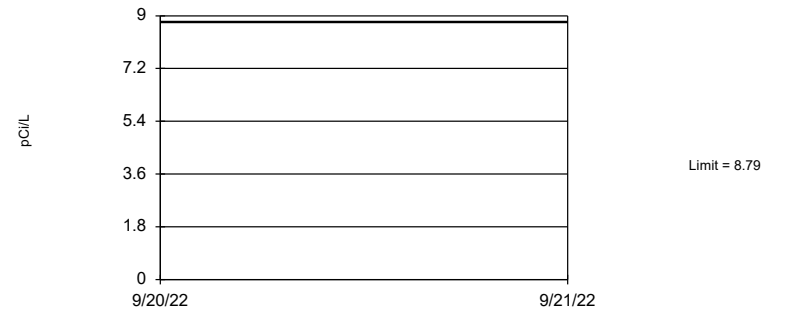
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 142 background values. 2.817% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006867.

Constituent: Cobalt, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 138 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0008431.

Constituent: Combined Radium 226 + 228 Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 150 background values. 45.33% NDs. 97.07% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0004556.

Constituent: Fluoride, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 143 background values. 44.06% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006523.

Constituent: Lead, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

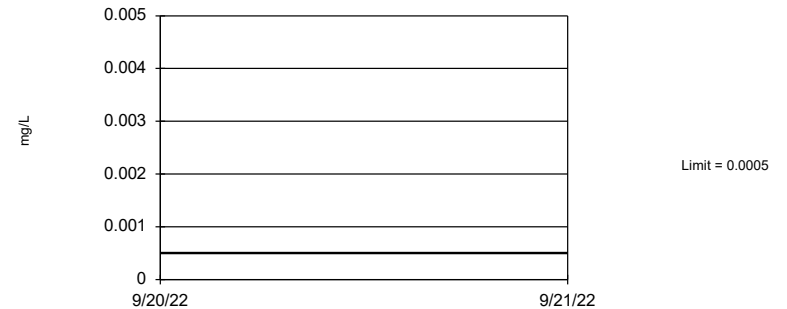
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 138 background values. 1.449% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0008431.

Constituent: Lithium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 144 background values. 62.5% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Mercury, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

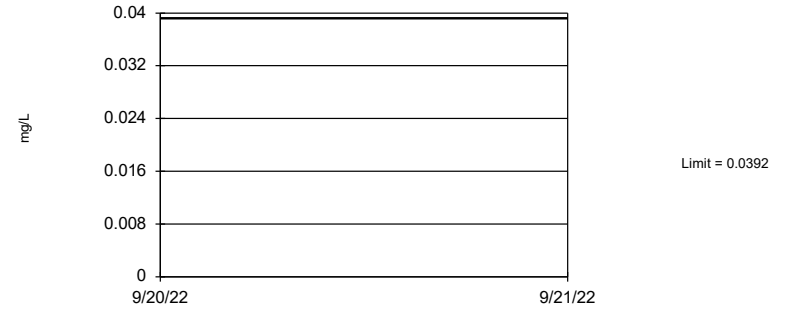
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 144 background values. 56.25% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Molybdenum, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

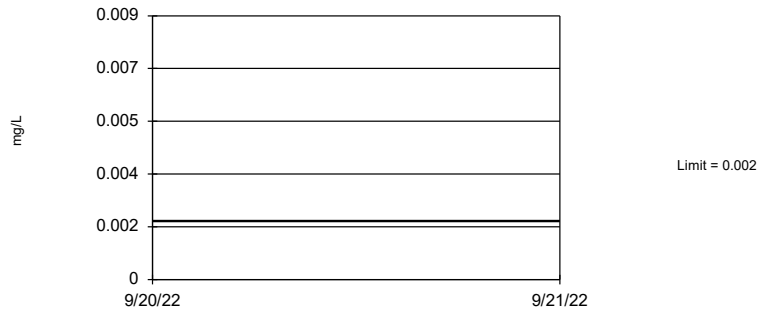
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 47.92% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Selenium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 144 background values. 89.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Thallium, total Analysis Run 12/29/2022 12:18 PM View: Appendix IV - UTLs  
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

FIGURE E  
GWPS

<b>FLINT CREEK LANDFILL GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR-Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.005	0.006
Arsenic, Total (mg/L)	0.01		0.008	0.01
Barium, Total (mg/L)	2		0.131	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.001	0.005
Chromium, Total (mg/L)	0.1		0.006	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.005	0.006
Combined Radium, Total (pCi/L)	5		8.79	8.79
Fluoride, Total (mg/L)	4		1	4
Lead, Total (mg/L)	n/a	0.015	0.005	0.015
Lithium, Total (mg/L)	n/a	0.04	0.041	0.041
Mercury, Total (mg/L)	0.002		0.0005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.01	0.1
Selenium, Total (mg/L)	0.05		0.0392	0.05
Thallium, Total (mg/L)	0.002		0.002	0.002

*\*Grey cell indicates background limit is higher than MCL or CCR-Rule Specified level*

*\*GWPS = Groundwater Protection Standard*

*\*MCL = Maximum Contaminant Level*

*\*CCR = Coal Combustion Residual*

FIGURE F  
Confidence Interval

# Confidence Intervals - All Results (No Significant)

Flint Creek Landfill    Client: Geosyntec    Data: Flint Creek LF    Printed 9/13/2023, 11:49 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	B-10	0.005	0.000108	0.006	No	26	42.31	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-11	0.005	0.0001	0.006	No	25	92	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-2	0.001816	0.000028	0.006	No	26	42.31	None	No	0.01	NP (normality)
Antimony, total (mg/L)	B-6	0.005	0.00008	0.006	No	26	73.08	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	B-9	0.005	0.00003	0.006	No	26	46.15	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-10	0.005	0.00038	0.01	No	26	30.77	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-11	0.005	0.00017	0.01	No	24	29.17	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-2	0.002573	0.00022	0.01	No	26	15.38	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-6	0.003636	0.00019	0.01	No	26	23.08	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	B-9	0.00168	0.00053	0.01	No	26	30.77	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-10	0.0835	0.078	2	No	26	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-11	0.129	0.1039	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	B-2	0.07945	0.0493	2	No	25	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	B-6	0.05789	0.04591	2	No	26	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	B-9	0.1595	0.1458	2	No	26	0	None	No	0.01	Param.
Beryllium, total (mg/L)	B-10	0.0005	0.000039	0.004	No	26	61.54	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	B-11	0.0004676	0.0002291	0.004	No	24	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	B-2	0.00017	0.00008	0.004	No	25	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	B-6	0.00009713	0.00002612	0.004	No	26	19.23	Kaplan-Meier	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	B-9	0.0005	0.000026	0.004	No	26	57.69	Kaplan-Meier	No	0.01	NP (NDs)
Cadmium, total (mg/L)	B-10	0.001	0.000026	0.005	No	26	42.31	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-11	0.0002899	0.00009164	0.005	No	24	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	B-2	0.0008704	0.000029	0.005	No	26	26.92	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-6	0.00027	0.000018	0.005	No	26	34.62	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	B-9	0.001	0.000011	0.005	No	26	61.54	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	B-10	0.002	0.00059	0.1	No	26	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-11	0.00327	0.000919	0.1	No	24	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-2	0.00376	0.00152	0.1	No	26	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	B-6	0.003412	0.001989	0.1	No	26	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	B-9	0.00203	0.001074	0.1	No	26	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-10	0.0008253	0.0002442	0.006	No	26	3.846	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	B-11	0.00097	0.000098	0.006	No	24	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	B-2	0.0005695	0.0001449	0.006	No	24	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	B-6	0.001143	0.0002856	0.006	No	26	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	B-9	0.0008084	0.0003004	0.006	No	26	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-10	1.45	0.961	8.79	No	25	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-11	1.67	0.835	8.79	No	24	0	None	No	0.01	NP (normality)
Combined Radium 226 + 228 (pCi/L)	B-2	2.05	1.282	8.79	No	25	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-6	1.647	0.6595	8.79	No	25	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	B-9	1.595	0.7064	8.79	No	25	0	None	ln(x)	0.01	Param.
Fluoride, total (mg/L)	B-10	1	0.09	4	No	27	40.74	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	B-11	1	0.04	4	No	26	61.54	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-2	1	0.09	4	No	26	50	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	B-6	1	0.03	4	No	27	62.96	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	B-9	1	0.09	4	No	27	37.04	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-10	0.002578	0.00014	0.015	No	26	42.31	None	No	0.01	NP (normality)
Lead, total (mg/L)	B-11	0.0005411	0.00009416	0.015	No	24	45.83	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-2	0.0004752	0.00009442	0.015	No	25	32	Kaplan-Meier	ln(x)	0.01	Param.
Lead, total (mg/L)	B-6	0.001177	0.0003096	0.015	No	26	3.846	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	B-9	0.00108	0.0002	0.015	No	26	50	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-10	0.00308	0.0014	0.041	No	25	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-11	0.004517	0.001617	0.041	No	24	0	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	B-2	0.005	0.00103	0.041	No	25	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	B-6	0.001368	0.000517	0.041	No	24	4.167	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	B-9	0.00386	0.00279	0.041	No	25	0	None	No	0.01	NP (normality)
Mercury, total (mg/L)	B-10	0.000025	0.000005	0.002	No	26	76.92	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-11	0.000025	0.000005	0.002	No	25	88	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-2	0.000025	0.000005	0.002	No	26	73.08	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-6	0.00001261	0.000005	0.002	No	26	61.54	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	B-9	0.000025	0.000005	0.002	No	26	88.46	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-10	0.001655	0.0008009	0.1	No	26	7.692	None	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	B-11	0.005	0.0005	0.1	No	25	76	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	B-2	0.002188	0.0009911	0.1	No	26	7.692	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	B-6	0.002	0.0003287	0.1	No	26	38.46	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	B-9	0.005	0.0004	0.1	No	26	57.69	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	B-10	0.005	0.00041	0.05	No	26	42.31	None	No	0.01	NP (normality)
Selenium, total (mg/L)	B-11	0.002934	0.002143	0.05	No	25	16	Kaplan-Meier	No	0.01	Param.
Selenium, total (mg/L)	B-2	0.01739	0.00804	0.05	No	26	0	None	ln(x)	0.01	Param.

# Confidence Intervals - All Results (No Significant)

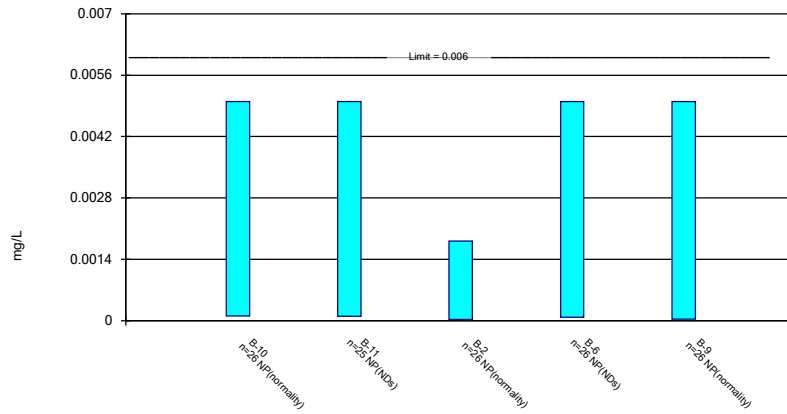
Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF Printed 9/13/2023, 11:49 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Selenium, total (mg/L)	B-6	0.002637	0.001643	0.05	No	26	3.846	None	No	0.01	Param.
Selenium, total (mg/L)	B-9	0.005	0.0004	0.05	No	26	46.15	None	No	0.01	NP (normality)
Thallium, total (mg/L)	B-10	0.002	0.0002	0.002	No	26	88.46	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-11	0.002	0.0002	0.002	No	25	92	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-2	0.002	0.0001	0.002	No	26	73.08	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-6	0.002	0.0002	0.002	No	26	88.46	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	B-9	0.002	0.0002	0.002	No	26	84.62	None	No	0.01	NP (NDs)



### Non-Parametric Confidence Interval

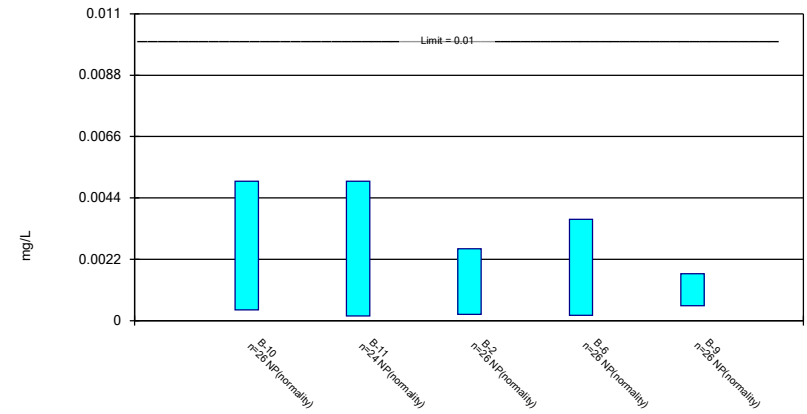
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

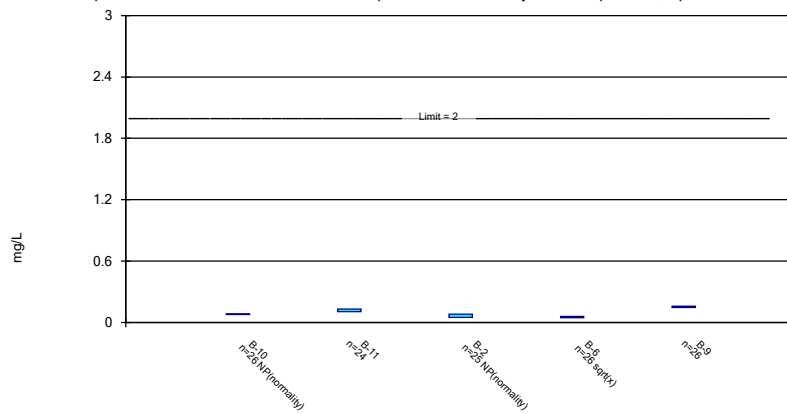
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

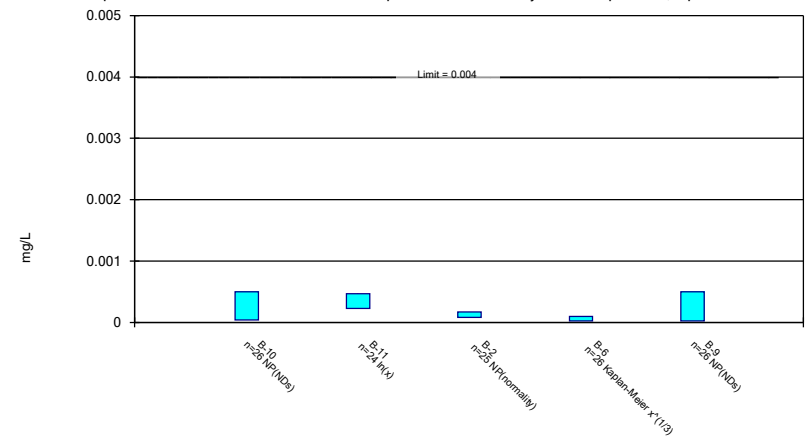
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

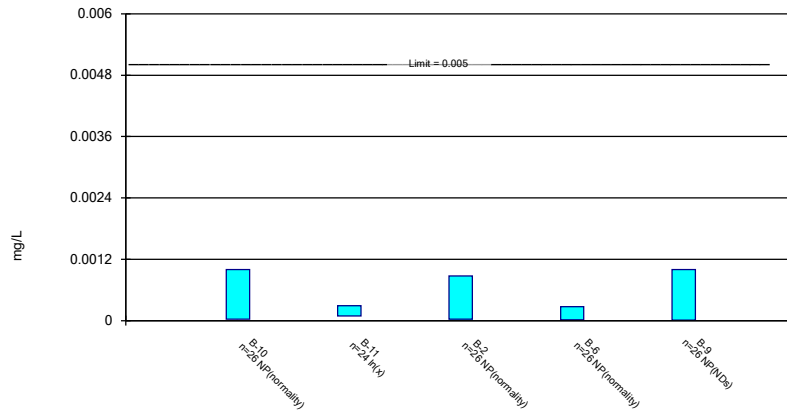
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

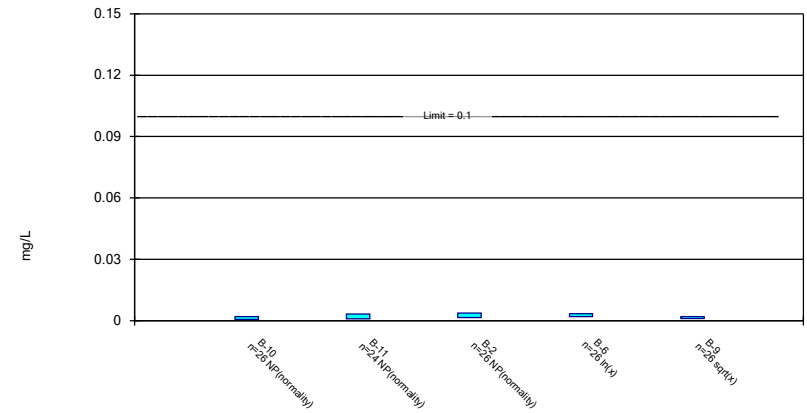
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

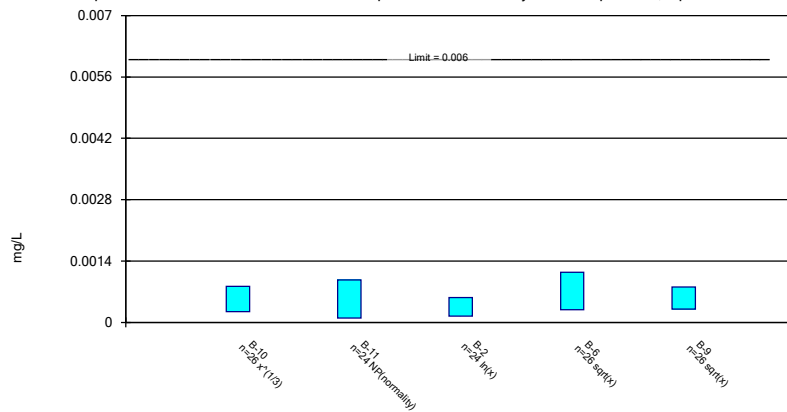
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

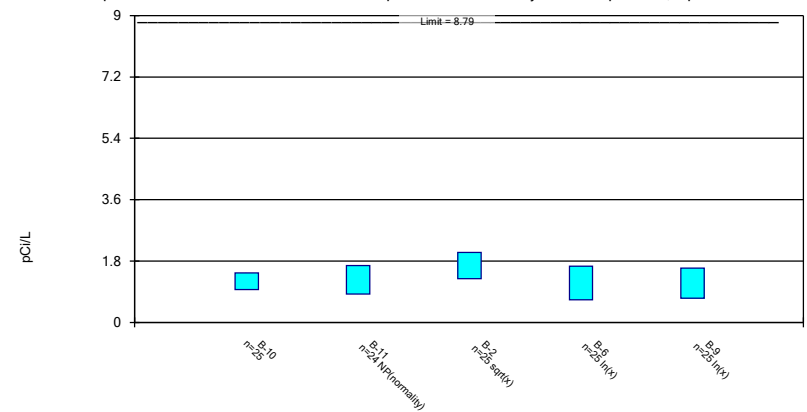
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

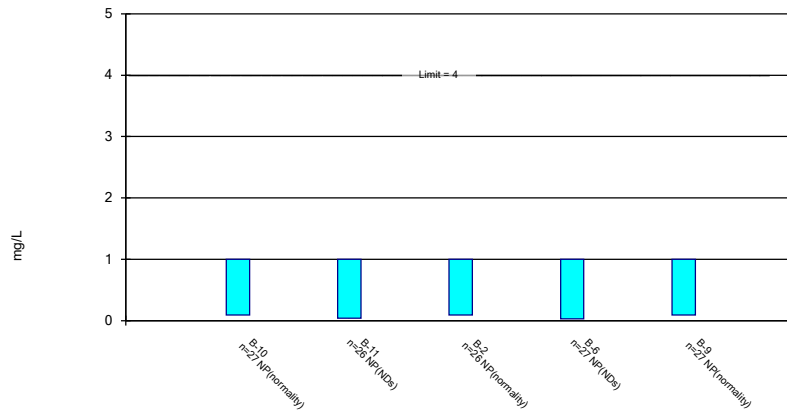
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

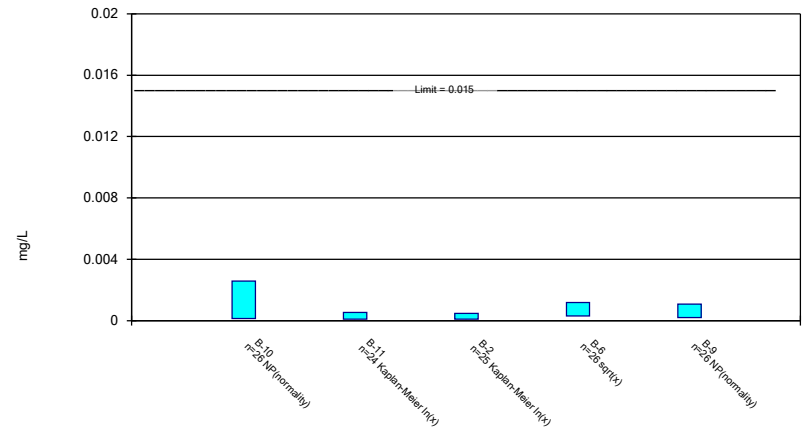
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

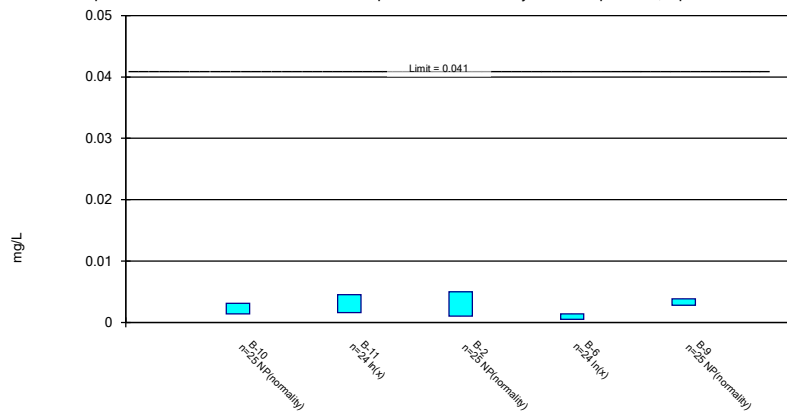
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

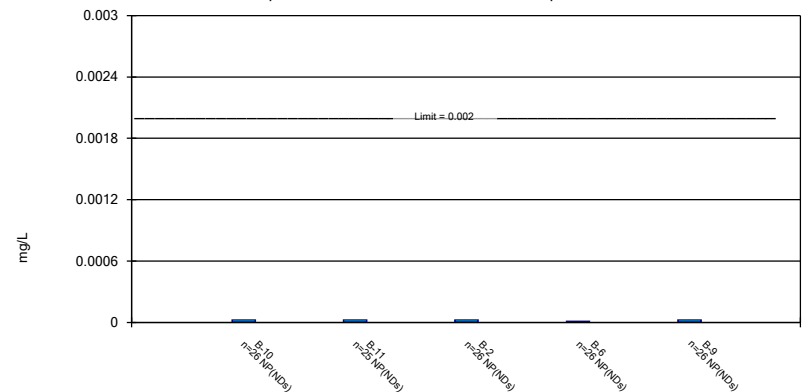
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

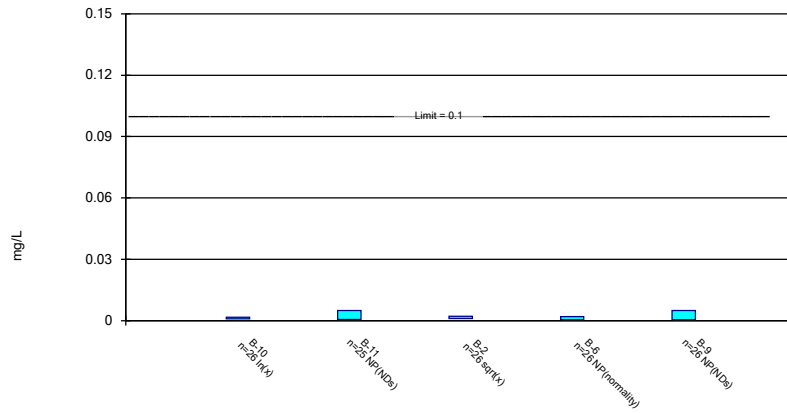
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

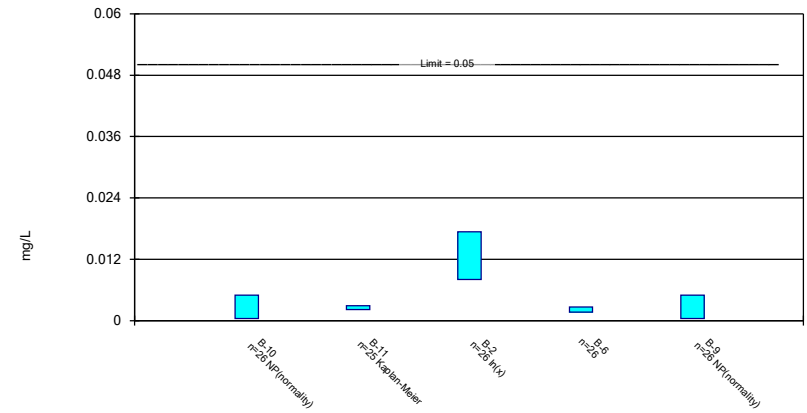
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

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

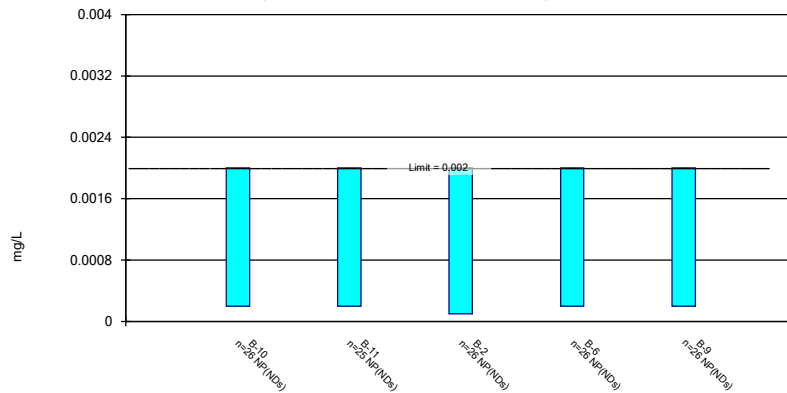
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

### Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 9/13/2023 11:48 AM View: Confidence Interval  
 Flint Creek Landfill Client: Geosyntec Data: Flint Creek LF

## Memorandum

Date: January 14, 2024

To: Bill Smith (AEP)

Copies to: Brian Newton (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of 2023 Reissued Analytical Laboratory Data for  
Flint Creek Plant's Landfill

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In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (CCR Rule; Code of Federal Regulations Title 40, Part 257, Subpart D) groundwater sampling was completed in 2023 to support assessment monitoring at the Landfill, an existing CCR unit at the Flint Creek Plant in Gentry, Arkansas. After the statistical evaluation was completed using data from the first semiannual assessment monitoring event,<sup>1</sup> select analytical laboratory reports were reissued to correct laboratory equipment data quality assurance/quality control issues.

A review of the reissued analytical laboratory reports identified several reported lithium results that had changed (Table 1). The site-specific background value for lithium was not updated as part of the first semiannual assessment monitoring event; therefore, the lithium results at background locations were not used in the statistical evaluation before the reissued analytical laboratory reports were reviewed. Both the initial reported lithium values and the revised lithium values at downgradient locations were below the site-specific groundwater protection standard of 0.0410 milligrams per liter, and no statistically significant levels of lithium were identified during the first semiannual assessment monitoring event.<sup>1</sup> Therefore, no changes to the statistical outcome of the first semiannual assessment monitoring event would occur.

The revised lithium values in the reissued laboratory analytical reports will be used in future reporting and statistical evaluations.

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<sup>1</sup> Geosyntec. 2023. *Statistical Analysis Summary – Flint Creek Plant Landfill, Gentry, Arkansas*. Geosyntec Consultants, Inc. October.

**Table 1. 2023 Revised Analytical Results  
Flint Creek Plant - Landfill**

*Geosyntec Consultants, Inc.*

Sample Date	Well ID	Well Location	CCR Unit	Constituent	Units	Initial Reported Value	Revised Value
6/20/2023	B-05	Background	Landfill	Lithium	mg/L	0.0022	0.00224
6/19/2023	B-12	Background	Landfill	Lithium	mg/L	0.0012	0.00119
6/20/2023	B-13	Background	Landfill	Lithium	mg/L	0.0006	0.00063
6/19/2023	B-02	Downgradient	Landfill	Lithium	mg/L	0.0021	0.00208
6/19/2023	B-06	Downgradient	Landfill	Lithium	mg/L	<0.0006 U1	0.00044
6/20/2023	B-09	Downgradient	Landfill	Lithium	mg/L	0.0029	0.00285
6/20/2023	B-10	Downgradient	Landfill	Lithium	mg/L	0.0022	0.00219

Notes:

1. All results are shown in milligrams per liter (mg/L).
2. Non-detect values are shown as less than the method detection limit with a 'U1' flag.

### **APPENDIX 3 – Alternative Source Demonstrations**

Alternative source demonstrations relative to Appendix IV SSLs above the groundwater protection standard were not necessary because no SSLs above the groundwater protection standards were identified in 2023. Alternative source demonstrations are not applicable at this time.

## **APPENDIX 4 - Notices for Monitoring Program Transitions**

No transition between monitoring requirements occurred in 2023; the CCR unit was in assessment monitoring at the beginning and at the end of the year. Notices for monitoring program transitions are not applicable at this time.



## **APPENDIX 5 - Well Installation/Decommissioning Logs**

No monitoring wells installed or decommissioned in 2023. Well installation/decommissioning logs are not applicable at this time.