Groundwater Monitoring & Corrective Action Report
CCR Landfill - Hunter Power Plant
Castle Dale, Utah

January 2024

Prepared For:
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Attachment B: Field Summary Report – October 2023 Event

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ACRONYMS

AMSL	Above Mean Sea Level
bgs	Below Ground Surface
CCR	Coal Combustion Residuals
CFR	U.S. Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FGD	Flue-Gas Desulfurization
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
UTL	Upper Tolerance Limit
WET	Water and Environmental Technologies

1.0 CURRENT STATUS - § 257.90(e)(6)

This Groundwater Monitoring and Corrective Action Report was prepared for PacifiCorp by Water & Environmental Technologies (WET). It was prepared to comply with the requirements detailed in *Code of Federal Regulations* § 257.90(e) (Coal Combustion Residuals (*CCR) Rule*).

The Hunter Power Plant is located in Emery County, approximately three miles south of Castle Dale, Utah. After dewatering and treatment, Flue Gas De-sulfurization (FGD) waste, fly ash and bottom ash are disposed of in the CCR Landfill. As a result, it is considered a CCR unit. The following provides the status of the groundwater monitoring and corrective action program at the end of 2023.

(i) The CCR Landfill was undergoing assessment / corrective measures monitoring at the start of 2023.
(ii) The CCR Landfill remained in assessment / corrective measures monitoring at the end of 2023.
(iii) Following completion of initial detection monitoring and prior to October 17, 2017, statistically significant increases (SSIs) above site-specific background concentrations were noted for the following Appendix III constituents:
(A) Boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS).
(B) The CCR Landfill program transitioned to assessment monitoring on January 15, 2018. SSIs above groundwater protection standards were noted in 2018 through 2023.
(iv) SSIs above groundwater protection standards were noted for the following Appendix IV constituents in 2023:
(A) Cobalt, lithium, and molybdenum.
(B) An assessment of corrective measures was initiated on January 14, 2019.
(C) A public meeting was held July 23, 2019.
(D) The assessment of corrective measures was completed on June 11, 2019.
(v) A remedy was selected on November 12, 2020.
(vi) A supplemental investigation report was completed in 2023. The CCR Landfill groundwater monitoring program was transitioned to corrective measures monitoring in November 2020.

1.1 Summary of Previous Work

Detection monitoring was initiated in September of 2015 to ensure a minimum of eight independent measurements were acquired prior to the October 17, 2017 requirement in the CCR Rule. PacifiCorp met this requirement and provided the findings of initial detection monitoring in the first Groundwater Monitoring and Corrective Action Report for the CCR Landfill (WET 2018).

The results of detection monitoring revealed all Appendix III constituents exceeded site-specific background concentrations. Based on these findings, the CCR Landfill monitoring program transitioned to assessment monitoring in 2018. Two rounds of sampling were completed in 2018, groundwater protection standards were established for the CCR Landfill, and assessment

monitoring results were compared to these standards. These comparisons revealed that Appendix IV constituents (lithium and molybdenum) exhibited SSIs above their groundwater protection standards.

Once Appendix IV constituents exhibited SSIs above groundwater protection standards, an investigation to characterize the nature and extent of the release was initiated. An assessment of corrective measures began January 14, 2019 and was completed on June 11, 2019. A public meeting was held in Huntington, Utah on July 23, 2019 to discuss the proposed alternatives and solicit public input. Based on the public input, additional sampling and investigation was conducted to delineate the nature and extent of impacts, and to support the assessment of corrective measures.

Inspections of the current condition and operation of the horizontal well capture system were completed on August 20, 2019, November 12, 2019, and November 2020. Additional groundwater samples collected in 2019 and 2020 were used to further evaluate the effectiveness of the current system and evaluate the need for any further actions.

The Nature and Extent Report was updated with the additional data from the investigations and placed in the plant operating record on August 27, 2020. The Corrective Measures Report was reviewed and based on the additional data, a remedy was selected and placed on the PacifiCorp webpage on November 12, 2020. The Corrective Measures Sampling and Analysis Plan (SAP) was completed in concert with the remedy selection report and was also placed in the Plant operating record October 12, 2020.

1.2 Report Purpose and Organization

The following sections provide a status update for activities initiated or completed at the Hunter Power Plant CCR Landfill during the 2023 monitoring period. They also summarize any issues or problems encountered and their resolutions. Each required element of the annual report is displayed below and is referenced to specific sections of the report where the required information can be found:

- Document the status of the Groundwater Monitoring and Corrective Measures Program;
- Summarize key actions completed;
- Describe any problems encountered;
- Discuss actions taken to resolve problems; and
- Define key activities for the upcoming year.

The Annual Groundwater Monitoring and Corrective Measures Report also includes the following required elements:

- A map showing the CCR unit and all CCR Monitoring Program background (or upgradient) and downgradient monitoring wells, and their identification numbers (Figure 1).
- Identifies any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
- A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required for detection or assessment monitoring.
- A narrative discussion of any transition between monitoring programs (i.e. transitioning from detection monitoring to assessment monitoring) - in addition to identifying constituents detected at a statistically significant increase over background levels.
- Other information required to be included as specified in § 257.90 through § 257.98 of the *CCR Rule* not listed above, is also included in the report.

2.0 GROUNDWATER MONITORING NETWORK

The detection / assessment monitoring network for the CCR Landfill was installed using appropriate spacing, location and depth as defined by the Code of Federal Regulations, 40 CFR, Part 257 and 261*, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; CCR Rule* § 257.91 (a) (1) and § 257.91 (b) to adequately monitor groundwater both hydraulically upgradient and downgradient of the site.

When installed in 2015, the CCR detection / assessment monitoring network consisted of four upgradient / background wells spanning the extent of the CCR Landfill east to west, and include: ELF-1D, ELF-2, ELF-9, and ELF-10. Downgradient monitoring wells for the CCR Landfill include seven locations placed to capture groundwater as it passes the waste unit boundary along the groundwater flow path which generally travels from west to east as it passes under the CCR Landfill. The downgradient monitoring wells include the following: ELF-3, ELF-4, ELF-5, ELF-6, ELF-7, ELF-8, and ELF-11.

Once SSIs above groundwater protection standards were noted for the CCR Landfill in 2018, an investigation was initiated to determine the nature and extent of impacted groundwater. To augment the initial monitoring network, three new wells were installed in November of 2018 east and downgradient of the CCR Landfill at the Plant boundary. The three wells included: ELF-12, ELF-13, and ELF-14 (Figure 1). These wells were incorporated into the groundwater monitoring program in 2019 and continue to undergo semi-annual monitoring in accordance with the CCR Rule throughout remedy selection and implementation in the monitoring network throughout active operations and until attainment is reached in downgradient water.

In February of 2022, three new wells were completed downgradient of the Hunter CCR Landfill; ELF-15, ELF-16 and ELF-17 (Figure 1), at the property boundary. In addition, ELF-5 and ELF-6, which were dry, were replaced by deeper wells ELF-5R and ELF-6R. These wells were

incorporated into the groundwater monitoring network in 2022, included in the groundwater elevation maps and analytical results are included in Table 1. Statistical analysis of their analytical results will not be completed until we have a minimum of eight individual samples for validity.

2.1 Monitoring Well Decommissioning & Replacement in 2023

No wells were replaced or decommissioned for the Hunter Landfill monitoring network in 2023.

2.2 Additions to the Monitoring Network in 2023

No new wells were added to the Hunter Landfill monitoring network in 2023.

3.0 GROUNDWATER MONITORING

The CCR Landfill was transitioned to assessment monitoring in 2018. Two rounds of sampling and analysis were performed annually in 2018 and 2019 to comply with the CCR Rule. Statistical analyses were completed comparing downgradient well results with groundwater protection standards. All of the samples underwent analysis in accordance with the requirements defined in the CCR Rule. In addition, water level and field data were acquired each time the wells were sampled in accordance with the SAP.

With the implementation of the selected remedy, the CCR Landfill monitoring network was transitioned to corrective measures monitoring in November 2020. This program incorporates both the original monitoring network and the additional downgradient wells listed in Section 2.0. All of the network wells were used for the 2023 analysis of compliance with CCR requirements and will remain in the monitoring network throughout active operations and post-closure care / monitoring once the CCR Landfill is closed.

Table 1 provides assessment / corrective measures monitoring data collected for the CCR Landfill in 2023. Attachments A and B contain field summary reports for the April and October 2023 sampling events, respectively. They consist of groundwater contour maps, data validation, statistical analyses, field data sheets, and laboratory data packages for each event.

3.1 Continuation - Assessment / Corrective Measures Monitoring

In accordance with the CCR Rule, the CCR Landfill remains in assessment / corrective measures monitoring. Two rounds of groundwater monitoring were completed in 2023 to assess water quality by comparing concentrations in downgradient wells to groundwater protection standards established during assessment monitoring. The comparisons for the April and October 2023 sampling events are summarized in Tables 2 and 3.

Table 2 indicates boron (ELF-4, ELF-5R, ELF-6R, ELF-8, ELF-11), cobalt (ELF-8, and ELF-11), lithium (ELF-6R) and molybdenum (ELF-8) exhibited SSIs above their groundwater protection standards for the April 2023 event. Table 3 indicates boron (ELF-4, ELF-5R, ELF-6R,

ELF-8, ELF-11, ELF-16), cobalt (ELF-8 and ELF-11), lithium (ELF-6R, ELF-16) and molybdenum (ELF-8) exhibited SSIs above their groundwater protection standards for the October 2023 event.

Monitoring well ELF-14 is a downgradient facility bounding well. The lithium concentration in ELF-14 has varied between 3.62 to 4.79 over its 5.5-yr monitoring period. Additional investigation was conducted in 2022 and 2023 as the exceedance could represent a natural variation in background water quality, residual contamination, or other possible scenarios. A Supplemental Investigation Report was prepared in 2023. The reduction in water level elevations in the downgradient groundwater monitoring wells, combined with the decrease in Horizontal Drain discharge, suggests that the CCR corrective measure remedies have been successful in reducing the contribution of leachate from the CCR landfill to the underlying shallow aquifer. The CCR Landfill and the underlying Mancos Shale are hydraulically connected and are being dewatered as a result of the corrective measures program. The reduction in saturated thickness of the CCR Landfill waste and the corresponding groundwater elevation reductions demonstrate that the CCR Corrective Measure Remedies have been successful in reducing leachate in the waste and reducing source contamination to the underlying aquifer.

4.0 SELECTION OF REMEDY

The potential remedies for the CCR Landfill at the Hunter Power Plant were assessed in the Corrective Measures Assessment completed in 2019 utilizing the criteria in § 257.96 *Assessment of Corrective Measures.* A public meeting was conducted July 23, 2019 to present the findings of the Nature and Extent Investigation and Corrective Measures Assessment. Public comments were solicited during the meeting and over the ensuing 30 days. Additional site characterization was conducted in 2019 to address the public concerns and to provide supplemental information to aid in selecting a remedy. The remedy for the CCR Landfill at the Plant was selected based on the criteria and evaluation factors in 40 CFR § 257.97 - *Selection of Remedy* and was posted to the Plant operating record on October 12, 2020.

The primary element of the selected remedy is the capture of groundwater through operation of horizontal wells installed beneath the landfill to collect leachate and impacted groundwater. The groundwater capture system at the CCR Landfill has operated since 2015 and has proven effective in reducing groundwater impacts and will remain in place.

A supplemental investigation took place in 2021 and 2022 to determine if the existing horizontal wells require augmentation in order to meet performance criteria. A Supplemental Investigation Report was prepared in 2023. There will be continued monitoring of effluent production from the horizontal well system. Abandonment and redrilling of groundwater monitoring wells that have become dry as a result of the decreased groundwater elevations will continue.

5.0 REMEDY IMPLEMENTATION

The horizontal well collection system at the Hunter CCR Landfill has been in operation since 2015 and has continued collection of leachate and impacted groundwater through 2023. The current system will remain as the primary element of the remedy.

6.0 PROBLEMS & RESOLUTIONS

Monitoring wells ELF-1D (spring and fall), ELF-3 (spring and fall), ELF-10 (spring and fall), and ELF-17 (spring and fall) did not produce sufficient water to support sampling. No other problems were noted during the 2023 monitoring period.

7.0 UPCOMING YEAR

During 2024, it is anticipated PacifiCorp will complete the following activities at the CCR Landfill:

Semi-Annual Monitoring

- Conduct the first semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data;
- Conduct the second semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data; and
- Develop the Annual Groundwater Monitoring and Corrective Action Report.

Corrective Measures

- Continue operating existing horizontal wells;
- Evaluate data to determine if additional corrective measures are appropriate; and
- Implement additional corrective measures, if necessary.

8.0 REFERENCES

EPA 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-540-R-201 7-001, January 2017.

EPA 2010. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater from Monitoring Wells, EPASOP-GW 001, January 2010.

EPA 1989. Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989.

WET, 2019. Corrective Measures Assessment, Hunter Power Plant, Castle Dale, Utah. June 2019.

WET, 2017. Sampling and Analysis Plan & Well Documentation, CCR Landfill – Hunter Power Plant, Castle Dale, Utah, Revision 1, October 2017.

FIGURES

Monitoring Network Wells
Monitoring Network Wells - Abandoned

ELF-17
ELF-11
ELF-6R
ELF-6
ELF-16
ELF-14
ELF-2
ELF-8
ELF-13
ELF-15
ELF-5R
ELF-5
ELF-12
ELF-7
ELF-4
ELF-1D
ELF-3
ELF-9
ELF-10

0 450 900 1,800 2,700 3,600 Feet

N
W E
S

NO.	DESCRIPTION	DATE	DRAFT	REVIEW
1	UPDATED LAYOUT	1/27/23	KK	
2				
3				
4				
5				

NOTES

CCR SAMPLE LOCATIONS

HUNTER POWER PLANT

FIGURE 1

JOB#: PERCM052

DATE:1/27/2023

Path: M:\PERC\PERC_CCR\GIS\2022_CCR_Sampling\Hunter\GIS\CCR_Sample_Locations.aprx, Author: kkresan

PACIFICORP

Water & Environmental TECHNOLOGIES

TABLES

Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	Appendix III														Appendix IV																											
						B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-1D	Background	09/18/2015	5669.55	84.43	5585.12	NS - Not enough water																																									
		11/10/2015		NM	NM	NS - Not enough water																																									
		12/01/2015		84.41	5585.14	NS - Not enough water																																									
		01/12/2016		84.25	5585.30	NS - Not enough water																																									
		02/02/2016		84.14	5585.41	NS - Not enough water																																									
		03/09/2016		NM	NM	NS - Not enough water																																									
		04/06/2016		83.45	5586.10	NS - Not enough water																																									
		05/04/2016		83.60	5585.95	NS - Not enough water																																									
		05/09/2017		82.60	5586.95	NS - Not enough water																																									
		08/02/2017		82.35	5587.20	NS - Not enough water																																									
		02/15/2018		98.82	5570.73	NA														<0.00200		<0.00200		0.0103		<0.00200		<0.000500		<0.00200		0.00542		<0.00200		2.12		<0.000150		0.0165		<0.00200		<0.00200		2.63	
		05/30/2018		99.87	5569.68	NS - Not enough water																																									
		05/08/2019		81.81	5587.74	2.23		377		6880		<0.100		7.02		7730		26800		<0.00400		<0.00200		0.0085		<0.00200		<0.000500		0.0023		<0.00400		<0.00200		2.20	J+	<0.0000900		0.0207		<0.00200		<0.00200		1.23	
		08/20/2019		83.22	5586.33	2.19		366	J+	6430		<0.200		7.27		8640		27000		<0.00400		<0.00200		0.0084		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.19		<0.0000900	UJ	0.0161		<0.00200		<0.00200		1.09	
		05/13/2020		83.89	5585.66	2.10		353		6640		<0.100		7.30		8940		28700	J	<0.00400		<0.00200		0.0103		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.96		<0.0000900		0.0153		<0.00200		<0.00200		2.20	
		10/29/2020		85.48	5584.07	NS - Not enough water																																									
		03/24/2021		83.21	5586.34	NS - Not enough water																																									
		10/26/2021		82.66	5586.89	1.94		393		7200		0.163		7.17	J+	10700	J-	25000		<0.00400		<0.00200		0.0104		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.89		<0.0000900	UJ	0.00866		<0.00200		<0.00200		4.4	
		04/07/2022		83.49	5586.06	NS - Not enough water																																									
		10/27/2022		82.78	5586.77	NS - Not enough water																																									
		04/06/2023		82.91	5586.64	NS - Not enough water																																									
		10/23/2023		82.19	5587.36	NS - Not enough water																																									
ELF-2	Background	09/18/2015	5612.02	20.20	5591.82	3.31		419		469		0.500		7.30		8150		11400		<0.001		<0.001		<0.05		<0.001		<0.001		<0.001		0.006		0.00100		1.50		<0.0001		0.0030		0.60800		<0.0005		2.30	
		11/10/2015		20.65	5591.37	3.27		419		444		<0.1		7.22		7870		11300		<0.002		<0.002		0.0092		<0.002		<0.0005		<0.002		<0.004		<0.002		4.93		<0.00015		0.0034		0.55600		<0.002		0.80	
		12/01/2015		21.02	5591.00	3.24		392		461		<0.1		7.21		8320		11500		<0.002		<0.002		0.0128		<0.002		<0.0005		<0.002		0.00559		<0.002		3.97		<0.00015		0.0038		0.53000		<0.002		8.10	J+
		01/12/2016		21.29	5590.73	3.38		420		473		0.277		7.24		8180		12300		<0.002		<0.002		0.0207		<0.002		<0.0005		<0.002		0.0114		<0.002		4.08		<0.00015		0.0043		0.49900		<0.002		1.99	
		02/02/2016		21.43	5590.59	3.50		410		471		0.100		7.14		7350		12000		<0.002		<0.002		0.0119		<0.002		<0.0005		<0.002		0.00501		<0.002		3.93		<0.00015		0.0031		0.45000		<0.002		1.25	
		03/09/2016		21.56	5590.46	3.48		395		430		<0.1		7.21		7190		11400		<0.002		<0.002		0.0138		<0.002		<0.0005		<0.002		0.00767		<0.002		2.14		<0.00015		0.0039		0.45100		<0.002		2.87	
		04/07/2016		21.67	5590.35	3.33		404		457		<0.1		7.16		8370		12400		<0.002		<0.002		0.0091		<0.002		<0.0005		0.0110		<0.004		<0.002		1.34		<0.00015		0.0051		0.46300		<0.002		0.94	
		05/04/2016		21.69	5590.33	3.15		364		439		0.103		7.76		8040		11700		<0.002		<0.002		0.0095		<0.002		<0.0005		<0.002		<0.004		<0.002		1.45		<0.00015		0.0030		0.39800		<0.002		0.85	
		09/08/2016		22.12	5589.90	3.25		428		446		0.299		7.30		7950		12300		<0.002		<0.002		0.0085		<0.002		<0.0005		<0.002		<0.004		<0.002		3.50		<0.00015		0.0029		0.36600		<0.002		0.61	
		05/09/2017		22.21	5589.81	NS - Not enough water																																									
		08/02/2017		22.14	5589.88	3.11		383		363		<0.100		7.42		7950		11600		<0.00200		<0.00200		0.0120		<0.00200		<0.000500		<0.00200		0.00565		<0.00200		1.54		<0.000150		0.0032		0.19800		<0.00200		1.37	
		02/15/2018		22.30	5589.72	NA														<0.00200		<0.00200		0.0113		<0.00200		<0.000500		<0.00200		0.00677		<0.00200		1.61		<0.000150		0.0031		0.08790		<0.00200		2.29	
		05/30/2018		22.24	5589.78	3.58		369	J-	245		0.192		7.12		6030		12000		<0.00100		<0.00200		0.0100		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.75	J-	<0.000150	J-	0.0026		0.07660		<0.00200		0.99	
		05/08/2019		22.53	5589.49	3.77		430		222		0.310		7.17		6950		12200		<0.00400		<0.00200		0.0099		<0.00200		<0.000500		0.0024		<0.00400		<0.00200		1.76	J+	<0.0000900		0.0031		0.03190		<0.00200		0.82	
		08/20/2019		22.72	5589.30	3.53		414	J+	218		<0.100		7.43		6780		12600		<0.00400		<0.00200		0.0084		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.52		<0.0000900	UJ	0.0026		0.03400		<0.00200		1.49	
		05/13/2020		23.22	5588.80	3.38		398		197		<0.100		7.27		6830		12000		<0.00400		<0.00200		0.0104		<0.00200		<0.000500		<0.00200		0.006		<0.00200		1.59		<0.0000900		0.0028		0.00566		<0.00200		2.17	
		10/29/2020		24.69	5587.33	3.18		356		199		<0.100		7.51	J	7900		12200		<0.00400		<0.00200		0.0097		<0.00200		<0.000500		<0.00200		0.00438		<0.00200		1.42		<0.0000900		<0.00200		0.00423		<0.00200		2.08	
		03/24/2021		23.38	5588.64	3.32		394		213		0.464		7.34		8720		11700		<0.00400		<0.00200		0.0099		<0.00200		<0.000500		<0.00200		0.00481		<0.00200		1.47		<0.0000900		0.0027		0.00309		<0.00200		1.63	
		10/26/2021		23.63	5588.39	3.12		400		213	J+	0.393		7.46	J+	8400	J-	12200		<0.00400		<0.00200		0.0102		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.87		<0.0000900	UJ	0.0022		0.00456		<0.00200		1.10	
		04/07/2022		23.91	5588.11	3.11		380		187	J	<10.0		7.20		7780	J	12400	J	<0.0005		0.0009	J	0.011		<0.0005		<0.0002		<0.005		0.0091	J	<0.0005		1.77	J-	<0.0002		0.0029		0.0095	J	<0.0002		0.25	
		10/27/2022		23.99	5588.03	2.94		385		222	J-	<0.5	UJ	7.20	J+	8070		13100	J+	<0.0005		0.0007		0.01		<0.0005		<0.0002		<0.005		0.0032		<0.0005		1.64		<0.00015		0.0024	J	0.0084		<0.0002		2.98	
		04/06/2023		24.21	5587.81	3.24		342		212	J	<0.500		7.4	J	8440		11900		<0.0005		0.0010		0.029		<0.0010		0.0002		0.066		0.0131		0.0021		1.56	J	<0.00015		0.0041		0.0033		0.0002		2.241	UJ
		10/23/2023		23.97	5588.05	2.95		364		218		<0.26		7.20	J	6100		12700		<0.00004		0.0005	J	<0.006		<0.0003		<0.00003		<0.007		0.0105		<0.0001		1.45		<0.00008		0.0025		0.003	J	<0.00003		5	J

NS: Not Sampled
NM: Not Measured
GWE: Ground Water Elevation
DTW: Depth to Water
TOC: Top of Casing
AMSL: Above Mean Sea Level

Q: Data Validation Qualifier
J: Estimated
J+: Overestimated
UJ: Estimated Non-Detect
J-: Underestimated

Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

						Appendix III														Appendix IV																											
SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-9	Background	09/18/2015	5661.00	NM	NM	NS - Not enough water																																									
		11/10/2015		NM	NM	NS - Not enough water																																									
		12/01/2015		NM	NM	NS - Not enough water																																									
		01/12/2016		51.14	5609.86	NS - Not enough water																																									
		02/02/2016		36.85	5624.15	<5.00		166		284		0.276		7.86		6470		9420		<0.002		0.00499		0.0794		<0.002		<0.0005		0.0157		<0.004		0.00435		2.48		<0.00015		0.0983		0.00424		<0.002		1.14	
		03/09/2016		23.63	5637.37	1.61		84.2		469		0.260		8.05		8030		11900		<0.002		0.00674		0.0411		<0.002		<0.0005		0.0056		<0.004		<0.002		1.05		<0.00015		0.1580		<0.002		<0.002		1.15	
		04/07/2016		23.49	5637.51	1.35		112		316		<0.100		7.86		7080		10400		<0.002		0.00679		0.0946		<0.002		<0.0005		0.0183		0.00498		0.00549		0.724		<0.00015		0.1290		<0.002		<0.002		2.60	
		05/04/2016		23.47	5637.53	1.30		64.6		282		1.29		7.75		6850		10100		<0.002		0.00546		0.0323		<0.002		<0.0005		0.0036		<0.004		<0.002		1.03		<0.00015		0.1220		<0.002		<0.002		0.64	
		09/08/2016		23.40	5637.60	1.36		57.2		352		1.65		8.03		6750		10600		<0.002		0.00524		0.0189		<0.002		<0.0005		<0.002		<0.004		<0.002		1.60		<0.00015		0.1230		<0.002		<0.002		0.66	
		05/09/2017		23.39	5637.61	NS - Not enough water																																									
		08/02/2017		31.38	5629.62	1.32		91.9		446		1.27		7.94		6900		12000		<0.00200		0.01140		0.1020		<0.00200		0.00053		0.0201		0.0052		0.00768		0.748		<0.000150		0.1410		<0.00200		<0.00200		1.84	
		08/29/2017		22.01	5638.99	1.50		53.9		391		1.16		7.94		5830		10500		<0.00200		0.00622		0.0165		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.801		<0.000150		0.1060		<0.00200		<0.00200		2.23	
		09/15/2017		23.32	5637.68	1.39		60.3		359		1.84		8.06		5600		11900		<0.00200		0.00762		0.0348		<0.00200		<0.000500		0.0053		<0.00400		<0.00200		0.783		<0.000150		0.1170		<0.00200		<0.00200		1.92	
		02/15/2018		22.81	5638.19	NA														<0.00200		0.0117		0.0767		<0.00200		<0.000500		0.0137		<0.00400		0.00489		0.74		<0.000150		0.1270		<0.00200		<0.00200		1.38	
		05/30/2018		23.25	5637.75	1.57		52.7	J-	416		1.19		7.89		5460		11200		<0.00100		0.00824		0.0137		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.10	J-	<0.000150	J-	0.1090		<0.00200		<0.00200		0.70	
		05/08/2019		23.24	5637.76	1.87		58.7		527		1.43		7.95		5750		10300		<0.00400		0.0096		0.0126		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.759	J+	<0.0000900		0.1130		<0.00200		<0.00200		1.34	
		08/20/2019		23.25	5637.75	1.91		57.7	J+	371		<0.200		7.51		5930		10700		<0.00400		0.00663		0.0134		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.888		<0.0000900	UJ	0.0679		<0.00200		<0.00200		1.50	
		05/13/2020		23.09	5637.91	1.49		57.1		595		0.799		7.82		7280		9900	J	<0.00400		0.00725		0.0128		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.06		<0.0000900		0.0768		<0.00200		<0.00200		1.56	
		10/29/2020		23.14	5637.86	1.27		48.9		442		0.708		8.05		6530		10900		<0.00400		0.00678		0.0126		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.873		<0.0000900		0.0657		<0.00200		<0.00200		1.36	
		03/24/2021		23.01	5637.99	1.45		67.1		464		1.560		8.01	J+	7470		10800		<0.00400		0.00506		0.0122		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.944		<0.0000900		0.0569		<0.00200		<0.00200		2.26	
		10/26/2021		22.93	5638.07	1.33		56.4		515	J+	1.840		8.19	J+	7100	J-	11400		<0.00400		0.00622		0.0118		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.21		<0.0000900	UJ	0.0571		<0.00200		<0.00200		<0.85	U
		04/07/2022		23.04	5637.96	1.17		70.7		332	J	<10.0		7.90		6440	J	10400	J	0.001		0.00440	J	0.0120		<0.0005		<0.0002		<0.005		0.0005	J	<0.0005		1.06		<0.0002		0.0445		0.00950	J-	<0.0002		NA	
		05/05/2022		22.94	5638.06	NA (Radium sample only)																																								1.44	
		10/27/2022		22.92	5638.08	1.16		125		244	J-	0.678	J-	7.90	J+	6130		9560	J+	0.0006		0.0037		0.013		<0.0005		<0.0002		<0.005		0.0008		<0.0005		1.04		<0.00015		0.0351	J	0.0093		<0.0002		1.523	
		04/06/2023		22.85	5638.15	1.31		86.8		242	J	0.754		7.9	J	5730		9540		0.0008		0.0025		0.016		<0.0005		<0.0002		<0.005		0.0005		<0.0005		1.09	J	<0.00015		0.0322		0.0012		<0.0002		1.95	UJ
		10/23/2023		22.61	5638.39	1.19		58.3		324		1.050		8.00	J	5470		10500		0.001		0.0047	J	<0.003		<0.00007		<0.00003		<0.004		0.0005		<0.0001		1.25		<0.00008		0.0403		0.0049	J	<0.00003		2.14	UJ
ELF-10	Background	09/18/2015	5620.57	50.64	5569.93	NS - Not enough water																																									
		11/10/2015		43.09	5577.48	1.56		446		6790		<0.1		7.10		19900		37200		<0.002		0.00292		0.0501		<0.002		0.00056		0.0057		0.00788		0.00318		4.59		<0.00015		0.1150		0.41000		<0.002		0.70	
		12/01/2015		44.21	5576.36	1.68		457		7530		3.98		7.21		20100		40300		<0.002		<0.002		0.0329		<0.002		0.00051		<0.002		0.0055		<0.002		3.49		<0.00015		0.1240		0.29000		<0.002		14.20	J+
		01/12/2016		46.50	5574.07	1.62		484		7670		4.36		7.41		19800		40100		<0.002		<0.002		0.0353		<0.002		0.00058		<0.002		0.00493		<0.002		3.60		<0.00015		0.1240		0.15700		<0.002		1.14	
		02/02/2016		46.09	5574.48	NS - Not enough water																																									
		03/09/2016		47.82	5572.75	NS - Not enough water																																									
		04/07/2016		47.35	5573.22	1.54		479		7120		3.97		7.15		20700		38400		<0.002		0.00366		0.0519		<0.002		0.00060		0.0050		0.00444		0.00325		0.841		<0.00015		0.1180		0.14600		<0.002		2.66	
		05/04/2016		48.73	5571.84	1.48		470		7530		3.87		8.37		19300		37800		<0.002		0.00929		0.0863		<0.002		0.00110		0.0164		0.00793		0.01200		1.12		<0.00015		0.1070		0.10500		<0.002		3.10	
		09/08/2016		48.05	5572.52	NS - Not enough water																																									
		05/09/2017		45.41	5575.16	NS - Not enough water																																									
		08/02/2017		46.80	5573.77	1.64		509		7150		<0.100		7.00		17300		38600		<0.00200		<0.00200		0.0391		<0.00200		0.00056		0.0084		0.00411		0.00217		2.09		<0.000150		0.0871		0.00903		<0.00200		0.46	
		08/29/2017		48.10	5572.47	1.84		500		6960		<0.100		7.28		16800		38200		<0.00200		<0.00200		0.0205		<0.00200		<0.000500		0.0020		<0.00400		<0.00200		1.53		<0.000150		0.0855		0.00821		<0.00200		3.56	
		09/15/2017		51.74	5568.83	1.6		445		5710		0.244		7.23		13100		39600		<0.00200		<0.00200		0.0601		<0.00200		<0.000500		0.0065		<0.00400		0.00311		2.20		<0.000150		0.0795		0.01050		<0.00200		3.42	
		02/15/2018		49.84	5570.73	NA														<0.00200		<0.00200		0.0679		<0.00200		<0.000500		0.0052		0.00429		0.00252		1.88		<0.000150		0.0618		<0.00200		<0.00200		2.30	
		05/30/2018		50.89	5569.68	1.73		468	J-	8790		<0.100		6.99		10000		35300		<0.00100		<0.00200		0.0304		<0.00200		<0.000500		0.0024		<0.00400		<0.00200		2.17	J-	<0.000150	J-	0.0546		<0.00200		<0.00200		2.20	
		05/08/2019		48.77	5571.80	2.12		543		9900		<0.100		6.88		10300		35200		<0.00400		<0.00200		0.0184		<0.00200		<0.000500		<0.00200		0.00558		<0.00200		1.76	J+	<0.0000900		0.0516		<0.00200		<0.00200		2.47	
		08/20/2019		51.64	5568.93	NS - Not enough water																																									
		05/12/2020		49.21	5571.36	1.59		474		11800		<0.100		6.85		9230		33600		<0.00400		<0.00200		0.0145		<0.00200		<0.000500		0.0030		0.00432		<0.00200		2.90		<0.0000900		0.0331		0.00234		<0.00200		2.41	
		10/28/2020		50.42	5570.15	1.54		407		12100		<0.100		7.79	J	8610		32900		<0.00400		<0.00200		0.0155		<0.00200		<0.000500		0.0022		0.00421		<0.00200		2.18		<0.0000900		0.0341		<0.00200		<0.00200		1.10	U
		03/24/2021		51.09	5569.48	NS - Not enough water																																									
		10/26/2021		49.23	5571.34	1.50		504		13100		<0.100		7.46	J+	9910	J-	39900		<0.00400		<0.00200		0.0147		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.89		<0.0000900	UJ	0.0142		<0.00200		<0.00200		2.39	
		04/07/2022		50.41	5570.16	NS - Not enough water																																									
		10/27/2022		48.50	5572.07	1.39		525		12700		<0.5	UJ	6.90		11000		37100	J+	<0.0025		0.0404		0.038		<0.0025		<0.001		0.0080		0.005		<0.0025		2.01		<0.00015		0.0131	J	0.327		<0.001		3.17	
		04/06/2023		50.56	5570.01	NS - Not enough water																																									
		10/23/2023		47.55	5573.02	NS - Not enough water																																									

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UJ: Estimated Non-Detect
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Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	Appendix III														Appendix IV																									
						B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-3	Downgradient	09/18/2015	5604.78	34.37	5570.41	NS - Not enough water																																							
		11/10/2015		NM	NM	NS - Not enough water																																							
		12/01/2015		34.40	5570.38	NS - Not enough water																																							
		01/12/2016		34.30	5570.48	NS - Not enough water																																							
		02/02/2016		34.25	5570.53	NS - Not enough water																																							
		03/09/2016		NM	NM	NS - Not enough water																																							
		04/07/2016		34.30	5570.48	NS - Not enough water																																							
		05/04/2016		NM	NM	NS - Not enough water																																							
		09/08/2016		34.02	5570.76	NS - Not enough water																																							
		05/09/2017		33.43	5571.35	NS - Not enough water																																							
		08/02/2017		33.32	5571.46	1.01		492		609		<0.100		7.79		33000		47700		<0.00200		<0.00200		0.0150		<0.00200		<0.000500		<0.00200		0.00455		<0.00200		4.20		<0.000150		0.0320		0.16900		<0.00200		3.76	
		02/15/2018		34.04	5570.74	NA														<0.00200		<0.00200		0.0118		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.67		<0.000150		0.0335		0.12500		<0.00200		2.22	
		05/30/2018		34.80	5569.98	NS - Not enough water																																							
		05/08/2019		31.75	5573.03	1.51		465		768		<0.100		7.52		27700		50700		<0.00400		0.00205		0.0391		<0.00200		0.00078		0.0042		0.0214		0.00605		3.26	J+	<0.0000900		0.0209		0.50200		<0.00200		3.61	
		08/20/2019		30.30	5574.48	<5.00		431	J+	642		<0.400		7.79		32000		50400		<0.00400		<0.00200		0.0111		<0.00200		<0.000500		0.0025		<0.00400		<0.00200		2.81		<0.0000900	UJ	0.0187		0.61700		<0.00200		3.04	
		05/13/2020		30.75	5574.03	1.08		455		840		<0.100		7.47		35100		49300		<0.00400		<0.00200		0.0405		<0.00200		<0.000500		0.0022		0.0159		0.00491		3.16		<0.0000900		0.0172		0.52100		<0.00200		5.41	
		10/28/2020		30.89	5573.89	1.05		390		545		<0.100		7.66	J	28800		48600		<0.00400		<0.00200		0.0107		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		3.61		<0.0000900		0.0157		0.45000		<0.00200		1.32	U
		03/24/2021		NM	NM	NS - Not enough water																																							
		10/26/2021		33.80	5570.98	NS - Not enough water																																							
		04/07/2022		33.32	5571.46	NS - Not enough water																																							
		10/27/2022		33.57	5571.21	NS - Not enough water																																							
		04/06/2023		33.34	5571.44	NS - Not enough water																																							
		10/23/2023		33.03	5571.75	NS - Not enough water																																							
ELF-4	Downgradient	09/18/2015	5581.50	15.03	5566.47	4.66		526		2320		0.300		7.20		5790		10400		<0.001		<0.001		<0.05		<0.001		<0.001		0.0020	J+	0.008		<0.001		1.70		<0.0001		0.0010		0.00400	J+	<0.0005		2.10	
		11/10/2015		14.97	5566.53	4.93		486		2040		4.46		6.94		5350		11200		<0.002		<0.002		0.0116		<0.002		<0.0005		<0.002		0.00583		<0.002		5.41		<0.00015		0.0026		0.00496		<0.002		1.60	
		12/01/2015		15.12	5566.38	4.88		482		2370		3.67		7.01		6240		11400		<0.002		<0.002		0.0118		<0.002		<0.0005		<0.002		0.00591		<0.002		4.31		<0.00015		0.0026		0.00486		<0.002		11.59	J+
		01/12/2016		15.22	5566.28	5.02		514		2500		3.93		7.52		5900		12400		<0.002		<0.002		0.0155		<0.002		<0.0005		<0.002		<0.004		<0.002		4.43		<0.00015		0.0030		0.00471		<0.002		1.39	
		02/02/2016		15.25	5566.25	5.19		495		2170		4.25		6.97		5410		11500		<0.002		<0.002		0.0119		<0.002		<0.0005		<0.002		0.00582		<0.002		4.39		<0.00015		0.0025		0.00352		<0.002		3.60	
		03/09/2016		15.36	5566.14	4.96		496		2240		4.06		7.03		5290		11200		<0.002		<0.002		0.0153		<0.002		<0.0005		<0.002		0.00729		<0.002		2.37		<0.00015		0.0031		0.00360		<0.002		2.20	
		04/06/2016		15.38	5566.12	4.77		519		2320		3.63		6.97		6110		11300		<0.002		<0.002		0.0139		<0.002		<0.0005		<0.002		0.00675		<0.002		2.96		<0.00015		0.0026		0.00365		<0.002		0.62	
		05/04/2016		14.41	5567.09	4.42		476		2280		<0.1		7.16		6010		11600		<0.002		<0.002		0.0123		<0.002		<0.0005		<0.002		0.00637		<0.002		1.40		<0.00015		0.0024		0.00281		<0.002		1.98	
		09/08/2016		NM	NM	NS - Not enough water																																							
		05/09/2017		16.05	5565.45	NS - Not enough water																																							
		08/02/2017		16.25	5565.25	4.35		483		2240		<0.100		7.21		5750		11600		<0.00200		<0.00200		0.0115		<0.00200		<0.000500		<0.00200		0.00611		<0.00200		1.65		<0.000150		0.0027		0.00255		<0.00200		2.57	
		02/15/2018		16.52	5564.98	NA														<0.00200		<0.00200		0.0141		<0.00200		<0.000500		0.0044		0.00833		<0.00200		1.71		<0.000150		0.0026		<0.00200		<0.00200		1.57	
		05/30/2018		16.53	5564.97	4.88		456	J-	2200		0.339		6.98		5290		11700		<0.00100		<0.00200		0.0116		<0.00200		<0.000500		<0.00200		0.00666		<0.00200		1.78	J-	<0.000150	J-	0.0028		<0.00200		<0.00200		1.81	
		05/08/2019		16.49	5565.01	5.00		515		1980		0.187		7.06		4800		11800		<0.00400		<0.00200		0.0118		<0.00200		<0.000500		<0.00200		0.00593		<0.00200		1.82	J+	<0.0000900		0.0027		<0.00200		<0.00200		1.72	
		08/20/2019		16.88	5564.62	4.98		507	J+	1840		0.941		7.22		4890		12200		<0.00400		<0.00200		0.0103		<0.00200		<0.000500		<0.00200		0.00637		<0.00200		1.71		<0.0000900	UJ	0.0024		<0.00200		<0.00200		2.73	
		05/13/2020		17.34	5564.16	4.60		489		2470		<0.100		6.89		6260		12100		<0.00400		<0.00200		0.0104		<0.00200		<0.000500		<0.00200		0.00553		<0.00200		1.69		<0.0000900		0.0046		<0.00200		<0.00200		2.00	
		10/28/2020		17.70	5563.80	4.74		446		2170		0.212		7.40	J	5860		12900		<0.00400		<0.00200		0.0111		<0.00200		<0.000500		<0.00200		0.00638		<0.00200		1.62		<0.0000900		0.0026		<0.00200		<0.00200		1.53	U
		03/24/2021		17.89	5563.61	4.77		491		2420		0.396		7.13		6290		12000		<0.00400		<0.00200		0.0119		<0.00200		<0.000500		<0.00200		0.00594		<0.00200		1.58		<0.0000900		0.0021		<0.00200		<0.00200		2.17	
		10/26/2021		18.10	5563.40	4.36		479		2220		0.319		7.23	J+	6200	J-	12400		<0.00400		<0.00200		0.0118		<0.00200		<0.000500		<0.00200		0.00608		<0.00200		1.82		<0.0000900	UJ	0.0023		<0.00200		<0.00200		1.45	
		04/07/2022		18.35	5563.15	4.13		437		2060	J	<50.0	UJ	7.00		5320	J-	13000	J	<0.0005		0.0015	J	0.012		<0.0005		0.0003		<0.005		0.0056	J	<0.0005		1.88		<0.0002		0.0024		0.0097	J	0.0005		2.43	
		10/26/2022		18.51	5562.99	4.28		464		2260		<0.5	UJ	7.00		6140		12100	J+	<0.0005		0.0051		0.012		<0.0005		0.0003		<0.005		0.0078		<0.0005		1.74		<0.00015		0.0024	J	0.0386		0.0005		2.302	
		04/05/2023		18.59	5562.91	4.79		463		2350	J	<0.500		7.1	J	6200		12800		<0.0005		0.0015		0.012		<0.0005		0.0004		<0.005		0.0069		<0.0005		1.80	J	<0.00015		0.0023		0.0150		0.0006		1.932	UJ
		10/23/2023		18.63	5562.87	4.28		448		1980		<0.26		7.00	J	5170		12900		<0.00004		0.0011	J	<0.006		<0.0003		0.0004		<0.007		0.0068		<0.0001		1.52		<0.00008		0.0024		0.011	J	0.0006		4.98	UJ
ELF-5	Downgradient	09/18/2015	5577.79	16.61	5561.18	5.44		464		4250		0.40		7.20		11200		21000		<0.001		<0.001		<0.05		<0.001		<0.001		0.0040		<0.005		<0.001		3.70		<0.0001		0.0020		0.05200	J+	<0.0005		3.20	
		11/10/2015		16.20	5561.59	5.89		499		4110		<0.1		6.98		11100		22600		<0.002		<0.002		0.0131		<0.002		<0.0005		<0.002		<0.004		<0.002		13.7		<0.00015		0.0045		0.04530		<0.002		1.70	
		12/02/2015		16.74	5561.05	5.53		480		4150		3.49		6.99		11200		21000		<0.002		<0.002		0.0097		<0.002		<0.0005		<0.002		<0.004		<0.002		9.96		<0.00015		0.0044		0.03760		<0.002		10.36	J+
		01/12/2016		16.85	5560.94	6.20		503		4210		4.85		7.26		11100		21300		<0.002		<0.002		0.0112		<0.002		<0.0005		<0.002		0.00402		<0.002		11.7		<0.00015		0.0045		0.03640		<0.002		1.56	
		02/02/2016		16.52	5561.27	6.10		481		3750		3.96		7.04		9890		21000		<0.002		<0.002		0.0097		<0.002		<0.0005		<0.002		<0.004		<0.002		10.6		<0.00015		0.0046		0.03250		<0.002		1.61	
		03/09/2016		16.47	5561.32	6.55		492		4170		4.62		7.05		10300		22300		<0.002		<0.002		0.0123		<0.002		<0.0005		<0.002		0.00413		<0.002		5.83		<0.00015		0.0050		0.02970		<0.002		2.89	
		04/06/2016		16.31	5561.48	5.35		476		3700		3.53		7.10		11200		19200		<0.002		<0.002		0.0179		<0.002		<0.0005		0.0022		0.00457		<0.002		3.10		<0.00015		0.0045		0.03370		<0.002		3.70	
		05/04/2016		15.35	5562.44	5.99		465		3900		<0.1		7.19		10700		21100		<0.002		<0.002		0.0151		<0.002		<0.0005		<0.002		0.00424		<0.002		5.68		<0.00015		0.0044		0.03060		<0.002		1.75	
		09/08/2016		17.30	5560.49	6.03		491		3980		<0.1		7.03		10300		20600		<0.002		<0.002		0.0170		<0.002		<0.0005		0.0023		0.00409		<0.002		8.64		<0.00015		0.0042		0.03970		<0.002		2.02	
		05/09/2017		17.13	5560.66	NS - Not enough water																																							
		08/02/2017		NM	NM	NS - Not enough water																																							
		02/15/2018		18.00	5559.79	NA														<0.00200		<0.00200		0.0103		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		4.35		<0.000150		0.0046		0.01810		<0.00200		1.81	
		05/30/2018		17.98	5559.81	7.61		459	J-	4420		0.104		7.04		11100		27800		<0.00100		<0.00200		0.0117		<0.00200		<0.000500		<0.00200		0.0043		<0.00200		6.85	J-	<0.000150	J-	0.0050		0.02500		<0.00200		2.37	
		05/08/2019		18.58	5559.21	6.06		489		3180		0.108		7.09		8640		21600		<0.00400		<0.00200		0.0138		<0.00200		<0.000500		<0.00200		0.0102		<0.00200		4.29	J+	<0.0000900		0.0049		0.00913		<0.00200		2.85	
		08/20/2019		18.69	5559.10	8.7		510	J+	4440		0.962		7.23		12300		24000		<0.00400		0.00212		0.0267		<0.00200		<0.000500		0.0044		0.00618		0.00246		5.93		<0.0000900	UJ	0.0072		0.01270		<0.00200		2.77	
		05/13/2020		17.74	5560.05	NS - Not enough water																																							
		10/28/2020		18.75	5559.04	NS - Not enough water																																							
		03/24/2021		NM	NM	NS - Not enough water																																							
		10/26/2021		NM	NM	NS - Not enough water																																							
ELF-5R	Downgradient	04/06/2022	5578.79	20.94	5557.85	4.31		423		2330	J	<50.0	UJ	7.10		5970	J-	14300	J	<0.0005		0.0129	J	0.013		<0.0005		0.0002		<0.005		0.0047	J	<0.0005		3.94	J-	<0.0002		0.0044		0.120	J	0.0006		2.65	
		10/27/2022		21.48	5557.31	4.45		456		3610		<0.5	UJ	7.00		8740		22600	J+	<0.0005		0.0078		0.017		<0.0005		<0.0002		<0.005		0.0043		<0.0005		3.81		<0.00015		0.0048	J	0.078		0.0005		3.61	
		04/05/2023		21.32	5557.47	4.75		407		3650	J	<0.500		7.0	J	8190		17900		0.0006		0.0026		0.017		<0.0005		0.0002		<0.005		0.0042		0.0006		3.69	J	<0.00015		0.0042		0.0323		0.0006		2.186	UJ
		10/23/2023		21.54	5557.25	4.66		433		3210		<0.26		7.30	J	7160		18100		<0.00004		0.0024	J	<0.006		<0.0007		0.0002		<0.007		0.0044		0.00080		3.36		<0.00008		0.0041		0.030	J	0.0006		2.4	UJ

NS: Not Sampled
NM: Not Measured
GWE: Ground Water Elevation
DTW: Depth to Water
TOC: Top of Casing
AMSL: Above Mean Sea Level

Q: Data Validation Qualifier
J: Estimated
J+: Overestimated
UJ: Estimated Non-Detect
J-: Underestimated

Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	Appendix III														Appendix IV																											
						B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-6	Downgradient	09/18/2015	5579.61	15.97	5563.64	14.3		531		5650		0.60		7.20		9470		22100		<0.001		<0.002		<0.05		<0.001		<0.001		0.0010	J+	0.027		<0.001		5.80		<0.0001		<0.001		0.28400		<0.0005		4.70	
		11/10/2015	5578.79	16.02	5563.59	16.0		518		4670		<0.10		6.78		9130		19500		<0.002		<0.002		0.0102		<0.002		<0.0005		<0.002		0.0226		<0.002		18.7		<0.00015		<0.002		0.07970		<0.002		1.40	
		12/01/2015		16.09	5563.52	14.4		454		4850		4.03		7.03		10300		19500		<0.002		<0.002		0.0094		<0.002		<0.0005		<0.002		0.0208		<0.002		14.6		<0.00015		<0.002		0.08870		<0.002		33.62	J+
		01/12/2016		16.20	5563.41	14.6		505		NA		NA		NA		NA		NA		<0.002		<0.002		0.0105		<0.002		<0.0005		<0.002		0.0208		<0.002		15.1		<0.00015		<0.002		0.08920		<0.002		1.68	
		02/02/2016		16.29	5563.32	13.6		493		4060		5.13		6.94		8800		20100		<0.002		<0.002		0.0093		<0.002		<0.0005		<0.002		0.0191		<0.002		14.2		<0.00015		<0.002		0.08280		<0.002		2.26	
		03/09/2016		16.26	5563.35	15.7		500		1190		5.07		6.90		930		20800		<0.002		<0.002		0.0109		<0.002		<0.0005		<0.002		0.0206		<0.002		7.20		<0.00015		<0.002		0.09590		<0.002		2.70	
		04/06/2016		16.30	5563.31	13.3		491		4890		4.87		7.04		9910		20200		<0.002		<0.002		0.0089		<0.002		<0.0005		<0.002		0.0178		<0.002		1.63		<0.00015		<0.002		0.09510		<0.002		1.93	
		05/04/2016		16.12	5563.49	12.6		491		4630		<0.1		7.40		8400		19600		<0.002		<0.002		0.0115		<0.002		<0.0005		<0.002		0.0186		<0.002		7.92		<0.00015		<0.002		0.09170		<0.002		1.53	
		09/08/2016		NM	NM	NS - Not enough water																																									
		05/09/2017		16.52	5563.09	NS - Not enough water																																									
		08/02/2017		NM	NM	NS - Not enough water																																									
		02/15/2018		16.30	5563.31	NA														<0.00200		<0.00200		0.0099		<0.00200		<0.000500		<0.00200		0.0147		<0.00200		5.50		<0.000150		0.0024		0.09240		<0.00200		1.76	
		05/30/2018		17.87	5561.74	NS - Not enough water																																									
		05/08/2019		17.62	5561.99	12.4		539		3810		0.139		7.06		7840		23700		<0.00400		<0.00200		0.0159		<0.00200		<0.000500		<0.00200		0.0358		<0.00200		5.56	J+	<0.0000900		<0.00200		0.00795		<0.00200		5.23	
		08/20/2019		18.25	5561.36	NS - Not enough water																																									
		05/13/2020		NM	NM	NS - Not enough water																																									
		10/28/2020		NM	NM	NS - Not enough water																																									
		03/24/2021		NM	NM	NS - Not enough water																																									
		10/26/2021		NM	NM	NS - Not enough water																																									
ELF-6R	Downgradient	04/06/2022	5579.99	20.21	5559.78	2.64		341		2440	J	<50.0	UJ	7.40		11700	J-	29200	J	<0.0005		0.0016	J	0.013		<0.0005		<0.0002		<0.005		0.0049	J	<0.0005		2.81		<0.0002		0.0022		0.0432	J	<0.0002		1.49	
		10/27/2022		20.51	5559.48	2.78		404		3920		<0.5	UJ	7.20		14200		26100	J+	<0.001		0.0094		0.01		<0.001		<0.0004		<0.005		0.0052		<0.001		2.82		<0.00015		0.0017	J	0.125		<0.0004		1.531	
		04/05/2023		20.20	5559.79	4.74		465		10900	J	<0.500		7.2	J	16200		33600		0.0008		0.0015		<0.100		<0.0005		<0.0002		<0.100		0.0113		0.0007		4.35	J	<0.00015		0.0016		0.445		<0.0002		1.307	UJ
		10/23/2023		20.58	5559.41	3.43	J+	447		4930		<0.26		7.30	J	13600		30700		<0.00004		0.0016	J	<0.006		<0.0003		<0.00003		<0.007		0.0055		<0.0001		3.37		<0.00008		0.0016		0.0998	J	<0.00003		2.72	UJ
ELF-7	Downgradient	09/18/2015	5579.81	13.24	5566.57	1.72		496		2800		0.40		7.10		8720		15300		<0.001		<0.001		<0.05		<0.001		<0.001		<0.001		<0.005		<0.001		2.00		<0.0001		<0.001		0.45500		<0.0005		3.00	
		11/10/2015		13.42	5566.39	1.86		480		2600		4.00		6.93		8650		19200		<0.002		<0.002		0.0101		<0.002		<0.0005		<0.002		0.00529		<0.002		6.83		<0.00015		0.0024		0.39200		<0.002		1.50	
		12/01/2015		13.60	5566.21	1.98		471		2790		3.12		6.99		9050		16800		<0.002		<0.002		0.0112		<0.002		<0.0005		<0.002		0.00508		<0.002		5.41		<0.00015		0.0028		0.40800		<0.002		9.80	J+
		01/12/2016		13.68	5566.13	1.79		480		2910		4.36		7.11		9140		14900		<0.002		<0.002		0.0126		<0.002		<0.0005		<0.002		0.00604		<0.002		5.67		<0.00015		0.0026		0.40000		<0.002		1.27	
		02/02/2016		13.67	5566.14	1.81		469		2660		4.63		6.13		8250		17100		<0.002		<0.002		0.0100		<0.002		<0.0005		<0.002		0.00428		<0.002		5.35		<0.00015		0.0021		0.37300		<0.002		3.84	
		03/09/2016		13.77	5566.04	1.79		443		2710		3.37		7.01		8180		16800		<0.002		<0.002		0.0120		<0.002		<0.0005		<0.002		0.00668		<0.002		2.73		<0.00015		0.0030		0.38300		<0.002		2.90	
		04/06/2016		13.76	5566.05	1.70		485		2850		3.19		6.94		9580		16500		<0.002		<0.002		0.0093		<0.002		0.00050		<0.002		0.00447		<0.002		2.64		<0.00015		0.0023		0.42100		<0.002		1.39	
		05/04/2016		13.87	5565.94	1.58		445		2650		<0.1		7.16		8680		16900		<0.002		<0.002		0.0098		<0.002		<0.0005		<0.002		0.00483		<0.002		0.639		<0.00015		0.0021		0.36000		<0.002		1.64	
		09/08/2016		14.12	5565.69	1.84		458		2660		<0.1		7.07		8640		18100		<0.002		<0.002		0.0096		<0.002		<0.0005		<0.002		0.00498		<0.002		4.59		<0.00015		0.0024		0.36000		<0.002		2.34	
		05/09/2017		16.27	5563.54	NS - Not enough water																																									
		08/02/2017		14.37	5565.44	1.72		476		2480		<0.100		7.13		8680		17800		<0.00200		<0.00200		0.0124		<0.00200		<0.000500		<0.00200		0.00816		<0.00200		2.12		<0.000150		0.0025		0.25300		<0.00200		2.28	
		02/15/2018		14.71	5565.10	NA														<0.00200		<0.00200		0.0107		<0.00200		<0.000500		<0.00200		0.00613		<0.00200		2.13		<0.000150		0.0025		0.17500		<0.00200		1.35	
		05/30/2018		14.25	5565.56	1.86		444	J-	2590		0.329		6.99		8460		17200		<0.00100		<0.00200		0.0088		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.49	J-	<0.000150	J-	0.0025		0.13600		<0.00200		1.63	
		05/08/2019		14.86	5564.95	1.86		471		2710		0.132		7.03		8260		17200		<0.00400		<0.00200		0.0095		<0.00200		<0.000500		<0.00200		0.0053		<0.00200		2.23	J+	<0.0000900		0.0023		0.06620		<0.00200		2.26	
		08/20/2019		15.22	5564.59	2.24		459	J+	2720		3.88		7.19		9480		19500		<0.00400		<0.00200		0.0119		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.23		<0.0000900	UJ	0.0027		0.08190		<0.00200		2.22	
		05/13/2020		15.80	5564.01	1.84		542		3160		<0.100		6.73		10200		18700		<0.00400		<0.00200		0.0100		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.73		<0.0000900		0.0037		0.02050		<0.00200		1.73	
		10/28/2020		16.12	5563.69	NS - Not enough water																																									
		03/24/2021		NM	NM	NS - Not enough water																																									
		10/26/2021		16.29	5563.52	1.80		461		2980		0.330		7.33	J+	9610	J-	18400		<0.00400		<0.00200		0.0101		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.42		<0.0000900	UJ	0.0024		0.03110		<0.00200		<0.85	
		04/06/2022		16.62	5563.19	1.36		388		2710	J	<50.0	UJ	7.00		7370	J-	18800	J	<0.0005		0.0113	J	0.017		<0.0005		0.0003		<0.005		0.0079	J	0.0014		1.88	J-	<0.0002		0.0029		0.129	J	0.0006		2.91	
		10/26/2022		16.90	5562.91	1.64		457		2940		<0.5	UJ	7.00		7850		16500	J+	<0.001		0.0077		0.011		<0.001		<0.0004		<0.005		0.0062		<0.001		1.94		<0.00015		0.0022	J	0.0752		0.0006		2.203	
		04/05/2023		16.89	5562.92	1.61		421		3050	J	<0.500		7.2	J	7420		16300		<0.0005		0.0031		0.009		<0.0005		0.0002		<0.005		0.0048		<0.0005		1.91	J	<0.00015		0.0019		0.0287		0.0005		2.127	UJ
		10/23/2023		16.84	5562.97	1.81		460		2760		<0.26		7.10	J	5930		15900		<0.00004		0.0026	J	<0.006		<0.0007		0.0003		<0.007		0.0065		0.0011		1.73		<0.00008		0.0023		0.0409	J	0.0006		2.11	UJ

NS: Not Sampled
NM: Not Measured
GWE: Ground Water Elevation
DTW: Depth to Water
TOC: Top of Casing
AMSL: Above Mean Sea Level

Q: Data Validation Qualifier
J: Estimated
J+: Overestimated
UJ: Estimated Non-Detect
J-: Underestimated

Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	Appendix III														Appendix IV																													
						B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-8	Downgradient	09/18/2015	5584.50	8.37	5576.13	26.6		628		2320		1.40		7.60		3120		7430		<0.001		0.002		0.0700		<0.001		0.01000		0.0130		0.196		0.01200		3.50		<0.0001		0.4370		<0.004		<0.002		3.60	
		11/10/2015		8.15	5576.35	30.4		577		2160		<0.1		7.30		3140		7690		<0.002		<0.002		0.0163		<0.002		0.00073		<0.002		0.147		0.00527		10.7		<0.00015		0.5220		<0.002		<0.002		2.20	
		12/01/2015		8.29	5576.21	30.2		586		2370		0.874		7.52		3410		8070		<0.002		<0.002		0.0275		<0.002		0.00090		0.0035		0.15		0.00536		8.59		<0.00015		0.4880		<0.002		<0.002		18.90	J+
		01/12/2016		8.32	5576.18	29.7		623		2380	J+	1.04		7.62		3130		8340		<0.002		<0.002		0.0218		<0.002		0.00099		0.0022		0.2		0.00473		9.43		<0.00015		0.4590		<0.002		<0.002		1.80	
		02/02/2016		8.14	5576.36	27.2		579		2180		<0.100		7.47		2970		7860		<0.002		<0.002		0.0140		<0.002		<0.0005		<0.002		0.0143		<0.002		8.79		<0.00015		0.0173		0.00716		<0.002		1.98	
		03/09/2016		8.26	5576.24	26.6		590		2240		0.837		7.48		2950		7580		<0.002		0.00299		0.0533		<0.002		0.00113		0.0089		0.202		0.00682		5.09		<0.00015		0.4330		<0.002		<0.002		3.70	
		04/06/2016		8.40	5576.10	25.4		609		2300		<0.100		7.46		3390		7440		<0.002		<0.002		0.0244		<0.002		0.00114		0.0029		0.166		0.00545		<0.1		<0.00015		0.4810		<0.002		<0.002		2.60	
		05/04/2016		8.45	5576.05	25.4		588		2190		0.946		7.61		3170		7900		<0.002		0.00224		0.0507		<0.002		0.00105		0.0097		0.172		0.00657		4.40		<0.00015		0.4310		<0.002		<0.002		2.40	
		09/08/2016		8.66	5575.84	27.4		595		2350		1.33		7.53		3280		8010		<0.002		<0.002		0.0120		<0.002		0.00170		<0.002		0.145		0.00628		7.77		<0.00015		0.4710		<0.002		<0.002		2.10	
		05/09/2017		8.60	5575.90	NS - Not enough water																																											
		08/02/2017		8.79	5575.71	31.6		623		2110		1.69		7.54		3260		8420		<0.00200		<0.00200		0.0212		<0.00200		0.00294		0.0023		0.161		0.01260		3.54		<0.000150		0.4780		<0.00200		<0.00200		1.07	
		02/15/2018		8.56	5575.94	NA														<0.00200		<0.00200		0.0130		<0.00200		0.00332		<0.00200		0.197		0.00633		3.68		<0.000150		0.4310		<0.00200		<0.00200		1.24	
		05/30/2018		8.81	5575.69	28.7		537	J-	1940		0.975		7.47		2820		7920		<0.00100		<0.00200		0.0114		<0.00200		0.00199		<0.00200		0.188		0.00737		3.95	J-	<0.000150	J-	0.4410		<0.00200		<0.00200		1.98	
		05/08/2019		8.49	5576.01	29.8		606		2100		1.13		7.49		2980		9400		<0.00400		<0.00200		0.0110		<0.00200		0.00195		<0.00200		0.201		0.00643		4.03	J+	<0.0000900		0.3990		<0.00200		<0.00200		2.25	
		08/20/2019		9.17	5575.33	30.2		566	J+	1920		<0.100		7.41		3130		8240		<0.00400		<0.00200		0.0124		<0.00200		0.00174		<0.00200		0.19		0.00762		3.42		<0.0000900	UJ	0.4550		<0.00200		<0.00200		2.15	
		05/13/2020		8.94	5575.56	31.8		635		2250		0.885		7.51		3540		8340		<0.00400		<0.00200		0.0111		<0.00200		0.00162		<0.00200		0.207		0.00724		3.85		<0.0000900		0.3900		<0.00200		<0.00200		1.65	
		10/28/2020		10.52	5573.98	27.6		527		1910		0.957		7.74	J	3220		8380		<0.00400		<0.00200		0.0115		<0.00200		0.00159		<0.00200		0.198		0.00786		3.20		<0.0000900		0.4300		<0.00200		<0.00200		2.11	
		03/24/2021		8.96	5575.54	28.8		562		2340		1.630		7.58		3720		7820		<0.00400		<0.00200		0.0112		<0.00200		0.00158		<0.00200		0.228		0.00719		3.24		<0.0000900		0.4210		<0.00200		<0.00200		2.74	
		10/25/2021		9.11	5575.39	30.6		578		2040		1.300		7.76	J+	3550	J-	8140		<0.00400		<0.00200		0.0160		<0.00200		0.00173		<0.00200		0.198		0.00847		3.81		<0.0000900	UJ	0.3940		<0.00200		<0.00200		2.19	U
		04/07/2022		9.10	5575.40	25.8		506		1870	J	<50.0	UJ	7.40		2790	J-	4810	J	<0.0005		0.0046	J	0.012		<0.0010		0.0015		<0.005		0.193	J	0.0061		3.79		<0.0002		0.345		0.0373	J-	0.0006		NA	
		05/04/2022		9.06	5575.44	NA (Radium sample only)																																									0.24	
		10/26/2022		9.22	5575.28	28.2		527		2030		1.200	J-	7.40		3340		8180	J+	<0.0005		0.0039		0.012		<0.0005		0.0017		<0.005		0.216		0.0066		3.58		<0.00015		0.382	J	0.0414		0.0007		2.536	
		04/05/2023		9.19	5575.31	26.2		543		2040	J	0.787		7.5	J	3250		8160		<0.0005		0.0030		0.011		<0.0005		0.0014		<0.005		0.195		0.0065		3.46	J	<0.00015		0.343		0.0175		0.0005		2.08	UJ
		10/23/2023		9.38	5575.12	28	J+	540		1680		0.924		7.50	J	2720		8280		<0.00004		0.0018	J	<0.006		<0.0003		0.0014		<0.007		0.21		0.0076		3.31		<0.00008		0.384		0.0102	J	0.0007		2.06	UJ
ELF-11	Downgradient	09/18/2015	5597.32	28.03	5569.29	14.4		432		1230		0.500		7.50		10200		14300		<0.001		<0.001		<0.05		<0.001		<0.001		<0.001		0.017		<0.001		3.20		<0.0001		0.0160		0.00700		<0.0005		1.20	
		11/10/2015		28.09	5569.23	16.3		419		1180		<0.1		7.40		9890		15200		<0.002		<0.002		0.0203		<0.002		<0.0005		<0.002		0.0151		<0.002		10.2		<0.00015		0.0253		0.00644		<0.002		1.20	
		12/01/2015		28.45	5568.87	17.0		410		1290		<0.1		7.39		10900		17600		<0.002		<0.002		0.0189		<0.002		<0.0005		<0.002		0.0153		<0.002		8.58		<0.00015		0.0210		0.00753		<0.002		31.52	J+
		01/12/2016		28.42	5568.90	NS - Not enough water																																											
		02/02/2016		28.38	5568.94	16.3		414		952		<0.100		7.24		7910		15600		<0.002		<0.002		0.0139		<0.002		<0.0005		<0.002		0.0143		<0.002		8.49		<0.00015		0.0174		0.00739		<0.002		2.12	
		03/09/2016		28.46	5568.86	18.1		413		4290		<0.100		7.32		9020		15700		<0.002		<0.002		0.0224		<0.002		<0.0005		<0.002		0.0131		<0.002		4.33		<0.00015		0.0241		0.00545		<0.002		3.23	
		04/06/2016		28.41	5568.91	15.2		412		1230		<0.100		7.28		11100		15800		<0.002		<0.002		0.0191		<0.002		<0.0005		<0.002		0.0147		<0.002		3.29		<0.00015		0.0214		0.00700		<0.002		1.24	
		05/04/2016		28.31	5569.01	14.9		399		1170		<0.100		8.01		10000		15700		<0.002		<0.002		0.0245		<0.002		<0.0005		<0.002		0.014		<0.002		4.31		<0.00015		0.0205		0.00666		<0.002		2.78	
		09/08/2016		28.20	5569.12	17.3		434		1180		<0.100		7.24		10000		16200		<0.002		<0.002		0.0163		<0.002		<0.0005		<0.002		0.0126		<0.002		6.44		<0.00015		0.0201		0.00885		<0.002		0.95	
		05/09/2017		28.13	5569.19	NS - Not enough water																																											
		08/02/2017		28.36	5568.96	NS - Not enough water																																											
		02/15/2018		28.20	5569.12	NA														<0.00200		<0.00200		0.0193		<0.00200		<0.000500		<0.00200		0.0154		<0.00200		3.43		<0.000150		0.0220		0.05560		<0.00200		2.03	
		05/30/2018		28.19	5569.13	18.8		406	J-	993		0.136		7.23		8780		16700		<0.00100		<0.00200		0.0168		<0.00200		<0.000500		<0.00200		0.0202		<0.00200		3.99	J-	<0.000150	J-	0.0201		0.07270		<0.00200		1.83	
		05/08/2019		28.10	5569.22	17.8		436		1100		0.173		7.23		9980		16800		<0.00400		<0.00200		0.0142		<0.00200		<0.000500		<0.00200		0.0146		<0.00200		3.49	J+	<0.0000900		0.0183		0.06490		<0.00200		1.88	
		08/20/2019		28.31	5569.01	17.8		442	J+	1010		<0.100		8.02		9910		17000		<0.00400		<0.00200		0.0151		<0.00200		<0.000500		<0.00200		0.0151		<0.00200		3.36		<0.0000900	UJ	0.0186		0.06270		<0.00200		2.48	
		05/12/2020		28.11	5569.21	16.1		420		1000		<0.100		7.25		10700		18500		<0.00400		<0.00200		0.0138		<0.00200		<0.000500		<0.00200		0.0198		<0.00200		3.44		<0.0000900		0.0200		0.06630		<0.00200		2.67	
		10/28/2020		30.28	5567.04	15.6		384		1040		<0.100		7.89	J	10800		17800		<0.00400		<0.00200		0.0108		<0.00200		<0.000500		<0.00200		0.0197		<0.00200		3.15		<0.0000900		0.0183		0.06690		<0.00200		2.75	U
		03/24/2021		28.09	5569.23	15.2		415		1230		0.435		7.38	J+	12700		19100		<0.00400		<0.00200		0.0219		<0.00200		<0.000500		0.0026		0.0213		0.00210		3.4		<0.0000900		0.0164		0.08830		<0.00200		3.32	
		10/25/2021		28.09	5569.23	16.1		444		1110		<0.100		7.71	J+	12100	J-	17500	J+	<0.00400		<0.00200		0.0122		<0.00200		<0.000500		<0.00200		0.0194		<0.00200		4.37		<0.0000900	UJ	0.0182		0.10700		<0.00200		1.92	
		04/07/2022		28.09	5569.23	14.3		390		898	J	<50.0	UJ	7.30	J+	10500	J-	22000	J	<0.0005		0.0034	J	0.028		<0.0005		0.0002		<0.005		0.0211	J	0.0018		3.86	J-	<0.0002		0.0185		0.169	J	0.0003		NA	
		05/04/2022		28.04	5569.28	NA (Radium sample only)																																									2.15	
		10/26/2022		28.11	5569.21	14.6		435		989		<0.5	UJ	7.20		12300		16500	J+	<0.001		0.0015		0.071		<0.001		<0.0004		0.0100		0.0193		0.0025		3.79		<0.00015		0.017	J	0.138		<0.0004		2.642	
		04/05/2023		28.10	5569.22	15.1		378		1120	J	<0.500		7.4	J	7610		20500		<0.0005		<0.0005		0.020		<0.0005		0.0002		<0.005		0.0192		0.0010		3.62	J	<0.00015		0.0185		0.141		0.0003		2.57	UJ
		10/23/2023		28.07	5569.25	13.2		374		1200		<0.26		7.40	J	11900		21300		<0.00004		<0.00009	UJ	<0.006		<0.00007		0.0002		<0.007		0.02		0.0013		3.05		<0.00008		0.0182		0.163	J	0.0003		1.57	UJ
ELF-12	Downgradient	11/02/2018	5569.99	19.35	5550.64	1.36	J+	225	J-	732		0.262		7.65		11400		21700		<0.00400		<0.00200		0.0207		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.820		<0.000150		<0.00200		<0.00200		<0.00200		4.80	
		05/08/2019		19.59	5550.40	1.68		182		500		0.341		7.55		12200		20100		<0.00400		<0.00200		0.0192		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.839	J+	<0.0000900		<0.00200		<0.00200		<0.00200		2.25	
		08/20/2019		NM	NM	1.68		169	J+	428		<0.100		7.73		11400		19900		<0.00400		<0.00200		0.0165		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.792		<0.0000900	UJ	<0.00200		<0.00200		<0.00200		2.83	
		05/12/2020		20.15	5549.84	1.32		151		414		0.896		7.53		11200		19200		<0.00400		<0.00200		0.0099		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.937		<0.0000900		<0.00200		<0.00200		<0.00200		3.12	
		10/28/2020		20.48	5549.51	1.31		139		392		<0.100		8.05	J	11900		18600		<0.00400		<0.00200		0.0101		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.738		<0.0000900		<0.00200		<0.00200		<0.00200		2.42	U
		03/24/2021		20.86	5549.13	1.25		172		640		0.700		7.64	J+	13500		15600		<0.00400		<0.00200		0.0099		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		0.820		<0.0000900		<0.00200		<0.00200		<0.00200		4.26	
		10/25/2021		20.79	5549.20	1.25		173		605	J+	0.590		7.85	J+	13300	J-	19000		<0.00400		<0.00200		0.0096		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.340		<0.0000900	UJ	<0.00200		<0.00200		<0.00200		2.85	
		04/06/2022		21.35	5548.64	1.10		131		409	J	<20.0		7.60	J+	12200	J	9620	J	<0.0005		0.0009	J	0.009		<0.0005		<0.0002		<0.005		<0.0005	UJ	<0.0005		0.856		<0.0002		<0.0005		0.0049	J	<0.0002		NA	
		05/04/2022		21.41	5548.58	NA (Radium sample only)																																									2.93	
		10/27/2022		21.25	5548.74	1.18		167		478	J-	<0.5		7.60	J+	14000		19600	J+	<0.001		0.004		0.067		<0.001		<0.0004		0.0110		0.0027		0.0036		0.858		<0.00015		<0.001	UJ	0.0221		<0.0004		5.98	
		04/06/2023		21.65	5548.34	1.25		141		484	J-	<0.500		7.6	J	14500		20200		<0.0005		0.0010		0.013		<0.0005		<0.0002		<0.005		<0.0005		0.0005		0.808	J	<0.00015		<0.0005		0.0046		<0.0002		3.49	UJ
		10/23/2023		20.41	5549.58	1.16		162		533		<0.26		7.60	J	11800		20600		<0.00004		0.005	J	0.1		<0.0001		0.0002		<0.007		0.0046		0.008		0.721		<0.00008		0.0006		0.0053	J	0.0002		3.9	UJ

NS: Not Sampled
NM: Not Measured
GWE: Ground Water Elevation
DTW: Depth to Water
TOC: Top of Casing
AMSL: Above Mean Sea Level

Q: Data Validation Qualifier
J: Estimated
J+: Overestimated
UJ: Estimated Non-Detect
J-: Underestimated

Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results

SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	Appendix III														Appendix IV																											
						B		Ca		Cl		F		pH		SO_4		TDS		Sb		As		Ba		Be		Cd		Cr		Co		Pb		Li		Hg		Mo		Se		Tl		Radium 226+228	
						mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	s.u	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	pCi/L	Q
ELF-13	Downgradient	11/02/2018	5559.43	3.82	5555.61	0.664	J+	471	J-	2450		<0.100		7.24		7470		17900		<0.00400		<0.00200		0.0573		<0.00200		<0.000500		<0.00200		0.00471		<0.00200		1.72		<0.000150		<0.00200		<0.00200		<0.00200		2.26	
		05/08/2019		3.10	5556.33	0.703		481		2730		<0.100		7.03		7730		16700		<0.00400		<0.00200		0.0111		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		2.06	J+	<0.0000900		<0.00200		<0.00200		<0.00200		1.58	
		08/20/2019		NM	NM	0.732		461	J+	2420		0.798		7.25		7370		17300		<0.00400		<0.00200		0.0110		<0.00200		<0.000500		<0.00200		0.00407		<0.00200		1.86		<0.0000900	UJ	<0.00200		<0.00200		<0.00200		2.07	
		05/12/2020		3.52	5555.91	0.536		449		2770		<0.100		7.05		8300		17000		<0.00400		<0.00200		0.0097		<0.00200		<0.000500		<0.00200		<0.00400		<0.00200		1.82		<0.0000900		<0.00200		<0.00200		<0.00200		2.49	
		10/28/2020		4.63	5554.80	0.609		411		2720		<0.100		7.75	J	8870		16800		<0.00400		<0.00200		0.0100		<0.00200		<0.000500		<0.00200		0.00421		<0.00200		1.74		<0.0000900		<0.00200		<0.00200		<0.00200		2.32	
		03/24/2021		4.20	5555.23	0.580		471		3160		0.243		7.18	J+	9410		16500		<0.00400		<0.00200		0.0092		<0.00200		<0.000500		<0.00200		0.00432		<0.00200		1.84		<0.0000900		<0.00200		<0.00200		<0.00200		2.72	
		10/25/2021		4.36	5555.07	0.556		459		2810		0.200		7.44	J+	9040	J-	19900		<0.00400		<0.00200		0.0098		<0.00200		<0.000500		<0.00200		0.00426		<0.00200		2.36		<0.0000900	UJ	<0.00200		<0.00200		<0.00200		2.69	
		04/06/2022		4.71	5554.72	0.460		386		2510	J	<50.0	UJ	7.00	J-	7590	J-	16400	J	<0.0010		0.0023	J	0.009		<0.0005		<0.0004		<0.005		0.0044	J	<0.0005		1.98		<0.0002		0.0013		0.0488	J-	0.0003		NA	
		05/05/2022		4.59	5554.84	NA (Radium sample only)																																								1.57	
		10/26/2022		4.87	5554.56	0.5		430		2640		<0.5		7.00		8380		17900	J+	<0.001		0.0059		0.01		<0.001		<0.0004		<0.005		0.005		<0.001		1.94		<0.00015		0.0012	J	0.0545		0.0004		2.927	
		04/06/2023		4.78	5554.65	<0.50		293		2950	J-	<0.100		7.2	J	8750		17800	J-	<0.0005		0.0030		<0.050		<0.0010		0.0003		<0.050		0.0043		<0.0005		1.69	J	<0.00015		0.0009		0.0188		0.0004		3.37	UJ
		10/23/2023		4.89	5554.54	0.54		428		2490		<0.26		7.10	J	7920		18000		<0.00004		0.0038	J	<0.003		<0.00007		0.0002		<0.004		0.0042		<0.0001		1.94		<0.00008		0.0011		0.0249	J	0.0004		2.28	UJ
ELF-14	Downgradient	11/02/2018	5560.91	6.30	5554.61	2.95	J+	532	J-	3830		0.173		7.56		7450		20500		<0.00400		<0.00200		0.0464		<0.00200		<0.000500		<0.00200		0.0131		<0.00200		4.01		<0.000150		<0.00520		0.00401		<0.00200		1.60	
		05/08/2019		6.07	5554.84	2.42		534		5070		<0.100		7.13		7280		19700		<0.00400		<0.00200		0.0327		<0.00200		<0.000500		0.0089		0.00976		0.00241		4.79	J+	<0.0000900		0.0039		0.00512		<0.00200		2.58	
		08/20/2019		NM	NM	3.09		496	J+	3640		0.589		7.49		7280		19800		<0.00400		<0.00200		0.0137		<0.00200		<0.000500		<0.00200		0.00912		<0.00200		4.58		<0.0000900	UJ	0.0043		0.00664		<0.00200		2.69	
		05/12/2020		6.48	5554.43	2.32		486		4160		<0.100		7.32		8220		19400		<0.00400		<0.00200		0.0102		<0.00200		<0.000500		<0.00200		0.00728		<0.00200		4.12		<0.0000900		0.0039		0.00296		<0.00200		2.22	
		10/28/2020		6.00	5554.91	2.79		443		3880		<0.100		7.67	J	8730		18800		<0.00400		<0.00200		0.0129		<0.00200		<0.000500		<0.00200		0.00841		<0.00200		4.15		<0.0000900		0.0040		0.00573		<0.00200		2.12	U
		03/24/2021		6.74	5554.17	2.15		482		4770		0.413		7.22	J+	9740		16900		<0.00400		<0.00200		0.0106		<0.00200		<0.000500		<0.00200		0.00701		<0.00200		4.23		<0.0000900		0.0030		0.00314		<0.00200		2.34	
		10/25/2021		6.76	5554.15	2.48		494		4050		0.332		7.42	J+	9110	J-	19600		<0.00400		<0.00200		0.0150		<0.00200		<0.000500		<0.00200		0.0104		<0.00200		4.66		<0.0000900	UJ	0.0038		0.00344		<0.00200		2.19	
		04/06/2022		6.25	5554.66	1.90		438		3650	J	<50.0	UJ	7.20		7770	J-	19600	J	<0.0005		0.0151	J	0.010		<0.0005		<0.0002		<0.005		0.0072	J	<0.0005		4.42	J-	<0.0002		0.0037		0.133	J	0.0003		3.07	
		10/26/2022		7.22	5553.69	2.34		450		4020		<0.5		7.00		9260		17900	J+	<0.0025		0.0093		0.012		<0.0025		<0.001		<0.005		0.008		<0.0025		4.19		<0.00015		0.0038	J	0.0704		<0.001		2.801	
		04/06/2023		6.78	5554.13	1.93		417		3930	J-	<0.500		7.2	J	8780		18000		<0.0005		0.0041		0.010		<0.0005		<0.0002		<0.005		0.0062		<0.0005		4.19	J	<0.00015		0.0034		0.0275		0.0004		3.208	UJ
		10/23/2023		7.34	5553.57	2.39		415		3400		<0.26		7.20	J	8320		19500		<0.00004		0.0036	J	<0.006		<0.00007		0.00020		<0.007		0.0076		<0.0001		3.62		<0.00008		0.0042		0.0215	J	0.0005		3.06	UJ
ELF-15	Downgradient	04/06/2022	5563.81	7.79	5556.02	2.83		379		2380	J	<50.0	UJ	7.30	J+	8180	J-	18100	J	<0.0005		0.0015	J	0.014		<0.0005		0.0003		<0.005		0.0038	J	<0.0005		2.37		<0.0002		0.0029		0.0264	J	0.0002		2.66	
		10/27/2022		8.35	5555.46	3.19		437		2750		<0.5		7.00		9720		19900	J+	<0.0025		0.0073		0.012		<0.0025		<0.001		<0.005		0.0047		<0.0025		2.48		0.00025		0.0025	J	0.0612		<0.001		2.466	
		04/06/2023		7.94	5555.87	3.38		416		2820	J-	<0.500		7.2	J	9590		16000		0.0005		0.0029		0.024		<0.0005		0.0003		<0.005		0.0042		0.0012		2.53	J	<0.00015		0.0025		0.0256		0.0003		2.32	UJ
		10/23/2023		8.24	5555.57	3.4	J+	457		2480		<0.26		7.10	J	8880		19300		<0.00004		0.0018	J	<0.006		<0.0003		0.0003		<0.007		0.0041		<0.0001		2.24		<0.00008		0.0032		0.0174	J	0.0003		2.9	UJ
ELF-16	Downgradient	04/06/2022	5569.80	14.35	5555.45	6.64		388		3280	J	<50.0	UJ	7.40	J+	8160	J-	20000	J	<0.0005		0.0021	J	0.016		<0.0005		<0.0002		<0.005		0.0077	J	<0.0005		4.97		<0.0002		0.0046		0.0453	J	0.0003		2.19	
		10/27/2022		14.94	5554.86	7.82		445		3600		<0.5		7.00		9860		18300	J+	<0.0025		0.0091		0.03		<0.0025		<0.001		<0.005		0.0078		<0.0025		4.62		<0.00015		0.0041	J	0.0969		<0.001		3.73	
		04/06/2023		14.43	5555.37	7.74		414		3540	J-	<0.500		7.1	J	9270		20900		0.0005		0.0030		0.012		<0.0005		0.0002		<0.005		0.0063		<0.0005		4.80	J	<0.00015		0.0038		0.0495		0.0003		1.85	J
		10/23/2023		15.05	5554.75	7.83		422		3100		4.69		7.10	J	8460		20300		<0.00004		0.0025	J	<0.006		<0.00007		0.00020		<0.007		0.0063		0.00050		4.08		<0.00008		0.0037		0.0436	J	0.0004		3.3	UJ
ELF-17	Downgradient	04/05/2022	5585.00	NM	NM	NS - Not enough water																																									
		10/26/2022		NM	NM	NS - Not enough water																																									
		04/06/2023		29.65	5555.35	NS - Not enough water																																									
		10/23/2023		29.45	5555.55	NS - Not enough water																																									

NS: Not Sampled
NM: Not Measured
GWE: Ground Water Elevation
DTW: Depth to Water
TOC: Top of Casing
AMSL: Above Mean Sea Level

Q: Data Validation Qualifier
J: Estimated
J+: Overestimated
UJ: Estimated Non-Detect
J-: Underestimated

Table 2. Summary of Groundwater Quality Comparisons – April 2023 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	None Exceed
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.0025	0.004	0.004	None Exceed
Boron[1]	3.77	NA	3.77	ELF-4, ELF-5R, ELF-6R, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	None Exceed
Calcium	543	NA	543	None Exceed
Chloride	13100	NA	13100	None Exceed
Chromium	0.066	0.1000	0.1000	None Exceed
Cobalt	0.0131	0.006	0.0131	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	None Exceed
Fluoride Appendix III	4.36	NA	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.22	0.04	4.22	ELF-6R
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.56	NA	6.56	None Exceed
pH Basic Range	8.48	NA	8.48	None Exceed
Radium	6.1	5.0	6.1	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Sulfate	20700	NA	20700	None Exceed
TDS	40300	NA	40300	None Exceed
Thallium	0.002	0.002	0.002	None Exceed

[1] New monitoring well ELF-16 exhibited concentrations in excess of the background UTL for boron and the GWPS for lithium. ELF-16 was installed in 2022 as a boundary well for the landfill and as yet does not have eight independent measurements. As a result, it is not shown in Table C.5.

Table 3. Summary of Groundwater Quality Comparisons – October 2023 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standards
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	None Exceed
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.0025	0.004	0.004	None Exceed
Boron	3.77	NA	3.77	ELF-4, ELF-5R, ELF-6R, ELF-8, ELF-11, ELF-16
Cadmium	0.0011	0.0050	0.0050	None Exceed
Calcium	543	NA	543	None Exceed
Chloride	13100	NA	13100	None Exceed
Chromium	0.066	0.1000	0.1000	None Exceed
Cobalt	0.0131	0.006	0.0131	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	None Exceed
Fluoride Appendix III	4.36	NA	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.22	0.04	4.22	ELF-6R, ELF-16
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.56	NA	6.56	None Exceed
pH Basic Range	8.48	NA	8.48	None Exceed
Radium	6.1	5.0	6.1	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Sulfate	20700	NA	20700	None Exceed
TDS	40300	NA	40300	None Exceed
Thallium	0.002	0.002	0.002	None Exceed

ATTACHMENT A:

Field Summary Report – April 2023 Event

Water & Environmental TECHNOLOGIES

Field Summary Report

Facility Name:	Hunter Power Plant – CCR Landfill
Event Description:	Assessment Monitoring
Event Dates:	April 5-6, 2023
Field Personnel:	Brad Giles, Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite April 5, 2023 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

- ELF-10
- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-1D
- ELF-2
- ELF-3
- ELF-4
- ELF-5R
- ELF-6R
- ELF-7
- ELF-8
- ELF-9
- ELF-15
- ELF-16
- ELF-17

The following details dates for conducting field work and post-field work data processing:

- Date fieldwork completed: 4/6/2023
- Dates unvalidated lab data received: 4/24/2023 & 5/18/2023
- Data validation completion date: 09/01/2023

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to Chemtech-Ford in Sandy, Utah. Samples arrived at Chemtech-Ford on 4/7/2023. Chemtech-Ford subcontracted Radium analyses to Pace Analytical in Mount Juliet, Tennessee. Samples arrived at Pace Analytical on 4/12/2023. The following information is attached to this summary as a supplement:

- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

SAP DEVIATIONS. Wells ELF-3, ELF-10, ELF-17 and ELF-1D did not have enough water to sample.

Attachment A:

Groundwater Contour Map

ELF-1D = Well ID
5,586.64 = Water Level Elevation (ft.)
CCR Well
CCR Well - for Water Quality Only
Groundwater Elevation Conour (Contour Interval = 5 ft.)
Inferred Groundwater Elevation Conour (Contour Interval = 5 ft.)

N
W E
S

NO.	DESCRIPTION	DATE	DRAFT	REVIEW
1	MAP CREATION	7/21/23	JH	RH & EE
2	CONTOUR EDITS., LEF-17, ELF-9	9/29/23	KK	EE
3				
4				
5				

NOTES

ELF-17
5,555.35

ELF-16
5,555.37

ELF-14
5,554.13

ELF-11
5,569.22

ELF-6R
5,559.79

ELF-8
5,575.31

ELF-2
5,587.81

ELF-13
5,554.65

ELF-15
5,555.87

ELF-5R
5,557.47

ELF-12
5,548.34

ELF-7
5,562.92

ELF-4
5,562.91

ELF-1D
5,586.64

ELF-3
5,571.44

ELF-9
5,638.15

ELF-10
5,570.01

5570
5580
5585
5565
5560
5555
5550
5575

Feet
0 500 1,000 2,000

Measurement Date: 4/5/23 - 4/6/23
Imagery Date: 2021

GROUNDWATER ELEVATION MAP - CCR LANDFILL

HUNTER POWER PLANT

Attachment A

JOB#: PERCM052
DATE:9/29/2023

Path: M:\PERC\PERC_CCR\GIS\2023_CCR_Sampling\Hunter\2023_CCR_Sampling\2023_CCR_Sampling.aprx, Author: kkresan

PACIFICORP

Water & Environmental TECHNOLOGIES

Attachment B:

Data Validation Summary

Data Verification/Validation Checklist and Summary Report

PROJECT AND LABORATORY INFORMATION	
Project/Task/Sub-Task #:	PAC-HTRCCR-M052
Site & Location:	Hunter Power Plant – Castle Dale, UT
Sample Collection Date(s):	April 5-7, 2023
Laboratory & Location:	Chemtech-Ford Laboratories – Sandy, UT Pace Analytical – Mount Juliet, TN
Sample Delivery Group (SDG):	2023 Spring
Work Order (WO):	23D0472
Extraction/Prep Date(s):	NA
Analysis Date(s):	April 7 – May 13, 2023
Laboratory Report Date(s):	April 24, 2023 (Chemtech-Ford) May 17, 2023 (Pace Analytical)
Data Validator:	Richelle Carney
Data Validation Date(s):	August 8, 2023
Data Validation Reviewer:	Janelle Garza
Data Validation Review Date(s):	September 1, 2023

SDG/WO					
Sample ID	**Lab ID**	**Sample Date**	**Sample Time**	**Matrix**	**Notes**
ELF-2	23D0472-01/12D0470-01	4/6/2023	11:30	Aqueous	
ELF-4	23D0472-02/12D0470-02	4/5/2023	18:55	Aqueous	
ELF-5R	23D0472-03/12D0470-03	4/5/2023	18:20	Aqueous	
ELF-6R	23D0472-04/12D0470-04	4/5/2023	17:40	Aqueous	
ELF-7	23D0472-05/12D0470-05	4/5/2023	19:40	Aqueous	
ELF-8	23D0472-06/12D0470-06	4/5/2023	16:15	Aqueous	
ELF-9	23D0472-07/12D0470-07	4/6/2023	9:50	Aqueous	
ELF-11	23D0472-08/12D0470-08	4/5/2023	15:20	Aqueous	
ELF-12	23D0472-09/12D0470-09	4/6/2023	17:00	Aqueous	
ELF-13	23D0472-10/12D0470-10	4/6/2023	15:45	Aqueous	
ELF-14	23D0472-11/12D0470-11	4/6/2023	14:30	Aqueous	
ELF-15	23D0472-12/12D0470-12	4/6/2023	15:10	Aqueous	
ELF-16	23D0472-13/12D0470-13	4/6/2023	12:15	Aqueous	
Duplicate - (CCR)	23D0472-14/12D0470-14	4/5/2023	12:00	Aqueous	ELF-8 Duplicate
Field Blank - (CCR)	23D0472-15/12D0470-15	4/6/2023	9:50	Deionized Water	Field Blank

METHOD(S)/ANALYSES	
A2540 C	Total Dissolved Solids (TDS)
A4500-H B	pH
E200.7/8: Total Metals	Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Lead, Lithium, Molybdenum, Selenium, Thallium
E245.1	Mercury
E300.0	Chloride & Sulfate & Fluoride
E903.0/9315	Radium-226
904/9320	Radium-228

QUALIFIER DEFINITIONS	
U	The analyte was analyzed for but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J-	The result is an estimated quantity, but the result may be biased low.
J+	The result is an estimated quantity, but the result may be biased high.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

GUIDANCE DOCUMENTS			
List any/all Environmental Protection Agency (EPA) or state Department of Environmental Quality (DEQ) guidance documents referenced/resourced.			**N/A**
List any/all project quality assurance plan (QAP), sampling and analysis plan (SAP), or work plan (WP) referenced/resourced.			**N/A**
Sampling and Analysis Plan: Groundwater Monitoring: Hunter Power Plant : Castle Dale, Utah (July 2018)			
List any/all data validation (DV) standard operating guideline (SOG) or procedure (SOP) referenced/resourced.			**N/A**
Water & Environmental Technologies (WET) | Data Validation (DV): Standard Operating Guidelines (SOG) | Inorganic, Organic, Radioanalytical, & High Resolution			
Select the applicable United States Environmental Protection Agency (USEPA) National Functional Guidelines (NFGs) Superfund Methods Data Review (SMDR) referenced/resourced:	**Inorganic**	**Organic**	**N/A**
	X		
Select the applicable USEPA Guideline for Data Review referenced/resourced:	**High Resolution**	**Asbestos**	**N/A**
			X
Was the Idaho National Engineering and Environmental Laboratory (INEEL) Radioanalytical DV Guide referenced/resourced? If no, enter any/all radioanalytical DV SOG/SOP referenced/resourced:	**Yes**	**No**	**N/A**
	X		

CHECKLIST			
Field QA/QC			
Was field documentation provided and complete?	**Yes**	**No**	**N/A**
	X		
Were calibration checks within project stabilization criteria (or other applicable range)?	**Yes**	**No**	**N/A**
	X		
Was chain-of-custody (COC) documentation accurate and complete?	**Yes**	**No**	**N/A**
	X		
Were all planned samples able to be collected?	**Yes**	**No**	**N/A**
	X		
ELF-1D, ELF-3, ELF-10, and ELF-17 were dry and unable to be sampled. This is reflected in the sample delivery group completion total.			
Were samples submitted within a reasonable time frame to meet extraction/prep and/or analytical hold times (HT)? If no, detail below.	**Yes**	**No**	**N/A**
		X	
❖ The laboratory flagged all pH results for hold time exceedance. The hold time for pH is 15 minutes. It is not feasible to laboratory-analyze samples within 15 minutes of collection. Stabilized field pH measurements are provided in field documentation. All analytical pH results were qualified as estimated (J). ❖ TDS in ELF-13 was qualified as estimated low (J-) due to analysis 13.8 days after collection, >7-day hold time.			
Were samples submitted received by the laboratory in good condition?	**Yes**	**No**	**N/A**
	X		
	Yes	**No**	**N/A**

Were samples received by the laboratory within temperature and pH requirements? If no, detail below.	X		

Were volatile samples collected with zero headspace, or was enough volume available for analysis without using any containers with bubbles? If no, detail below.	**Yes**	**No**	**N/A**
			X

Were field duplicate (FD) samples required?	**Yes**	**No**	**N/A**
	X		
Were FD samples collected at the correct frequency? If no, all field data points are qualified as estimated (J/UJ) due to lack of field precision QA/QC (FDX).	**Yes**	**No**	**N/A**
	X		

Were FD relative percent difference (RPD) results at or below control limits (CLs)? If no, detail below.	**Yes**	**No**	**N/A**
		X	

ELF-9 (original) and Duplicate – (CCR) (duplicate): representing all samples

- Lithium RPD was 41.1%, >20% CL. The original and duplicate sample results were >5xRL.
  - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
  - All remaining samples were qualified as estimated (J) due to detected results.
- Chloride RPD was 27.5%, >20% CL. The original and duplicate sample results were >5xRL.
  - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
  - All remaining samples were qualified as estimated (J) due to detected results.
    - ELF-12, ELF-13, ELF-14, ELF-15, ELF-16, and Duplicate – (CCR) were more specifically qualified as estimated low (J-) due to low MS recovery.
- Radium 228 RPD was 97.9%, >20% CL.
  - No qualification required due to a mean difference <3 (1.5).

Was field decontamination of sampling equipment required?	**Yes**	**No**	**N/A**
		X	
Were equipment rinse blank (ERB) samples required?	**Yes**	**No**	**N/A**
		X	
Were ERB samples collected at the correct frequency? If no, all field data points are qualified (J/UJ) as estimated due to lack of field QA/QC (ERBX).	**Yes**	**No**	**N/A**
			X

Were all ERB results non-detect (ND)? If no, detail below.	**Yes**	**No**	**N/A**
			X

Were field blank (FB) samples required?	**Yes**	**No**	**N/A**
	X		
Were FB samples collected at the correct frequency? If no, all data is qualified as estimated due to lack of field QA/QC (FBX).	**Yes**	**No**	**N/A**
	X		
Were all FB results ND? If no, detail below.	**Yes**	**No**	**N/A**
		X	

Field Blank – (CCR): representing all samples

- TDS was detected at 14 mg/L, ≥RL of 10 mg/L.
  - No qualification was required for any samples due to all results ≥10xFB.
- Radium-226 was detected at 0.294 pCi/l, ≥2σ, >0, and >MDC (DL).
  - ELF-16 was qualified as an estimated detection (J) due to a result >MDC (DL), a mean difference >2, and a difference factor <10.
    - ELF-16 was qualified as an estimated ND (J) due to MB detection. The J qualifier will override the UJ qualifier.
  - All remaining samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.
- Radium-228 was detected at 2.03 pCi/l, ≥2σ, >0, and >MDA.
  - ELF-6R, ELF-8, ELF-16, and Duplicate – (CCR) were qualified as estimated detections (J) due to results >MDC (DL), mean differences >2, and difference factors <10.
  - All remaining samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.

Were trip blank (TB) samples required (volatiles analyses)?	**Yes**	**No**	**N/A**
		X	
Were TB samples submitted as required (one per shipping container)? If no, all data is qualified as estimated due to lack of TB (TBX).	**Yes**	**No**	**N/A**
			X

Other issues? If yes, detail below.	Yes	No	N/A
		X	

Field QA/QC Summary

Out of 330 total data points:

- 256 data points (77.6%) remain unqualified.
- Out of 74 data points (22.4%) qualified as estimated:
  - 16 data points (21.6% of qualified, 4.8% of total) were due to HT exceedances.
  - No data points were due to preservation (temperature and/or pH) issues.
  - 28 data points (37.8% of qualified, 8.5% of total) were due to blank contamination.
  - 30 data points (40.5% of qualified, 9.1% of total) were due to poor replication.
- No data points were rejected.

Laboratory QA/QC

Did the laboratory use appropriate methods to extract/prep and analyze all samples within HT?	Yes	No	N/A
	X		

Were there any results reported below the RL or in exceedance of (E) or over (O) instrument calibration? If yes, detail below.	Yes	No	N/A
		X	

Other issues? If yes, detail below.	Yes	No	N/A
	X		

The laboratory did not complete Radium 226+228 as instructed. This is reflected in the work order completion total.

Laboratory Blanks

Were TB results ND? If no, detail below.	Yes	No	N/A
			X

Were method blank (MB) samples analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were MB results ND? If no, detail below.	Yes	No	N/A
		X	

- Method 903.0/9315
  - Batch WG2050046: all samples
    - Radium-226 was detected at 0.413 pCi/l, ≥2σ, >0, and >MDC (DL).
      - All samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.
        - ELF-16 was qualified as an estimated detection (J) due to the FB detection. The J qualifier will override the UJ qualifier.
- Method 904/9320
  - Batch WG2056321: all samples except Field Blank – (CCR)
    - Radium-228 was detected at 0.280 pCi/l, ≥2σ, >0, and >MDC (DL).
      - ELF-16 was qualified as estimated ND (UJ) due to a result >MDC (DL), a mean difference between 0 and 2, and difference factor <10.
        - ELF-16 was qualified as an estimated detection (J) due to the FB detection. The J qualifier will override the UJ qualifier.
      - All remaining samples were qualified as estimated detections (J) due to results >MDC (DL), mean differences >2, and difference factors <10.
        - All samples except ELF-6R, ELF-8, ELF-16, and Duplicate – (CCR) were qualified as estimated ND (UJ) due to the FB detection. The J qualifier will override the UJ qualifier.

Laboratory Accuracy

Were initial/continuing calibration verification (ICV/CCV) analyses performed at the appropriate frequency?	Yes	No	N/A
	X		

Were ICV/CCV percent recoveries within CLs? If no, detail below.	Yes	No	N/A
	X		

Were laboratory fortified blanks (LFB) / control samples (LCS) analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were LFB/LCS percent recoveries within CLs? If no, detail below.	Yes	No	N/A
		X	

- Method E200.7
  - Batch BXD0533: Duplicate – (CCR) and Field Blank – (CCR)
    - Barium was recovered at 120%, >115% upper CL.
      - Duplicate – (CCR) was qualified as estimated high (J+) due to a detected result.
      - Field Blank – (CCR) did not require qualification due to a ND result.
    - Calcium was recovered at 119%, between the upper CL of 115% and the expanded upper CL of 140%.
      - Duplicate – (CCR) was qualified as estimated high (J+) due to a detected result.
      - Field Blank – (CCR) did not require qualification due to a ND result.

Were matrix spike (MS) samples analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were MS percent recoveries within CLs? If no, detail below.	Yes	No	N/A
		X	

- Method 200.7
  - Batch BXD0255: ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-9, ELF-11, ELF-12, ELF-13, ELF-14, ELF-15, and ELF-16
    - 23D0472-10: ELF-13
      - Calcium was recovered at 347% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
      - Lithium was recovered at 163% (MS) and 190% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0256: ELF-2
    - 23D0472-01: ELF-2
      - Calcium was recovered at 314% (MS) and 359% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
- Method 300.0
  - Batch BXD0289: ELF-2, ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-8, and ELF-9
    - 23D0472-01: ELF-2
      - Sulfate was recovered at 50.3% (MS) and 44.6% (MSD), <80% lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0313: ELF-12, ELF-13, ELF-14, ELF-15, ELF-16, Duplicate – (CCR) and Field Blank – (CCR)
    - 23D0430-01: unassociated work order
      - Chloride was recovered at 186% (MS) and 209% (MSD), >120% upper CL with QC ID BXD0313-MS(D)1. The parent sample result was ≥4x the spike concentration, thus no qualification was required.
      - Chloride was recovered at 76.4% (MS), <80% lower CL with QC ID BXD0313-MS(D)2. The parent sample result was <4x the spike concentration.
        - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
        - All remaining samples were qualified as estimated low (J-) due to detected results.
      - Sulfate was recovered at 7.36% (MS), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0346: ELF-11
    - 23C2043-02: unassociated work order
      - Chloride was recovered at 12.7% (MS) and 16.9% (MSD), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
      - Chloride was recovered at -162% (MS) and -161% (MSD), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.

Were surrogate recoveries within CLs (organics only)? If no, detail below.	Yes	No	N/A
			X

Laboratory Precision

Were laboratory duplicates analyzed at a frequency of one per 20 samples or one per batch, either through laboratory sample duplicates (LSD), LCS duplicates (LCSD), or MS duplicates (MSD)?	Yes	No	N/A
	X		

Were laboratory duplicate RPD results at or below CLs? If no, detail below.	Yes	No	N/A
		X	

- Method E903/9315
  - Batch WG2050046: all samples
    - L1604336-18: Field Blank - CCR
      - Radium-226 RPD was 83.2%, >20% CL.
        - No qualification was required due to a mean difference <3 (0.84).
- Method E904/9320

- Batch WG2056321: all samples except Field Blank - CCR
  - L1604336-01: unassociated sample delivery group
    - Radium-228 RPD was 200%, >20% CL.
      - No qualification required due to a laboratory-calculated RER <3 (1.33).
- Batch WG2057687: Field Blank - CCR
  - L1604350-01: unassociated work group
    - Radium-228 RPD was 200%, >20% CL.
      - No qualification required due to a laboratory-calculated RER <3 (1.22).

Were serial dilution (SD) samples analyzed at a frequency of one per 20 samples or one per batch (metals only)?	Yes	No	N/A
		X	

Were SD RPD results at or below CLs? If no, detail below.	Yes	No	N/A
			X

Laboratory QA/QC Summary

Out of 330 total data points:

- 292 data points (88.5% of total) remain unqualified.
- Out of 38 data points (11.5% of total) qualified as estimated:
  - No data points were due to detections below the RL or above the instrument upper calibration value or estimated values.
  - 29 data points (76.3% of qualified, 8.8% of total) were due to laboratory blank contamination.
  - 9 data points (23.7% of qualified, 2.7% of total) were due to poor accuracy (high LCS and low MS recoveries).
  - No data points were due to poor precision.
- No data points were rejected.

OVERALL SUMMARY

Data Quality

Out of 330 total data points:

- 253 data points (76.7%) remain unqualified and are considered quantitative.
- Out of 77 data points (23.3%) qualified as estimated and assigned as qualitative:
  - 74 data points (96.1% of qualified, 22.4% of total) due to field QA/QC.
  - 36 data points (46.8% of qualified, 10.9% of total) due to laboratory QA/QC.
- No data points were rejected.

Completeness

Out of 19 samples planned, 4 wells were dry and unable to be sampled, so 15 samples were completed. This sample delivery group is 78.9% complete. This is not reflective of quality.

Out of 120 analyses planned, the lab failed to complete Radium 226+228 analysis, so 105 analyses were completed. This work order is 87.5% complete. This is not reflective of quality.

Attachment C:

Statistical Analysis

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1.0 INTRODUCTION

This appendix contains a statistical analysis of the data collected from the groundwater monitoring network for the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to evaluate compliance vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient and downgradient water quality. Table C.1 lists the upgradient and downgradient wells that are used in this analysis. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix it means that no samples were able to be collected from that well.

Table C.1. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-3
ELF-2	ELF-4
ELF-9	ELF-5R
ELF-10	ELF-6R
	ELF-7
	ELF-8
	ELF-11
	ELF-12
	ELF-13
	ELF-14
	ELF-15
	ELF-16
	ELF-17

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis is to establish background values from the upgradient well data and compare these to the downgradient well data to determine if the downgradient water quality has been / remains impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

2.1.1 Mean

One measure of primary interest is the center of the data. The average ($\bar{x}$), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad (1)$$

Where:

$\bar{x}$ = mean

n = number of observations

x_i = i^{th} observation.

2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (s) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}} \quad (2)$$

Where:

s = standard deviation

n = number of observations

x_i = i^{th} observation

$\bar{x}$ = mean of the observations.

2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and

provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\bar{X}} \times 100\% \quad (3)$$

Where:

s = standard deviation

$\bar{X}$ = mean of the observations

2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25th percentile of the data, the median is the 50th percentile of the data, and the third quartile is the 75th percentile of the data. The 25th percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25th percentile. The median and third quartiles are found in a similar manner.

2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2023).

2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.

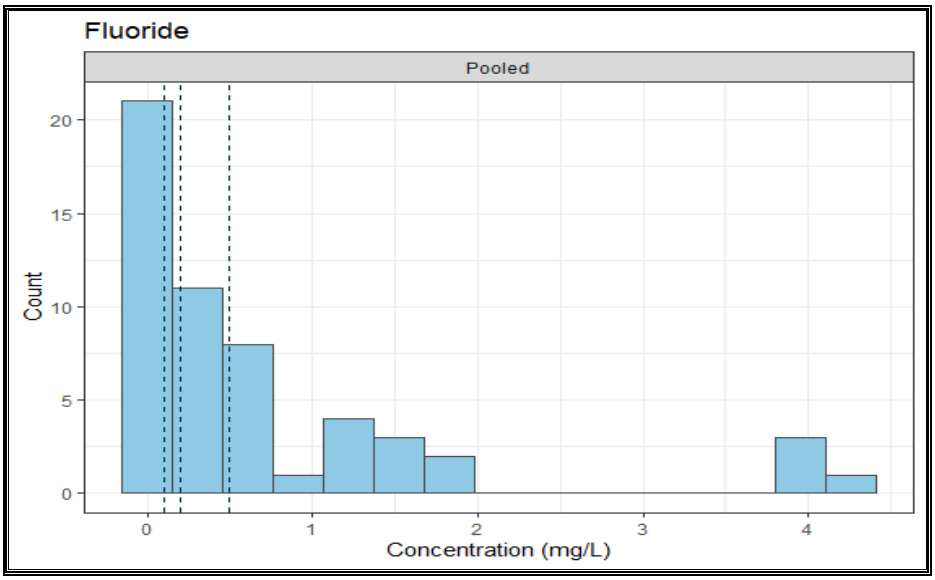

Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.

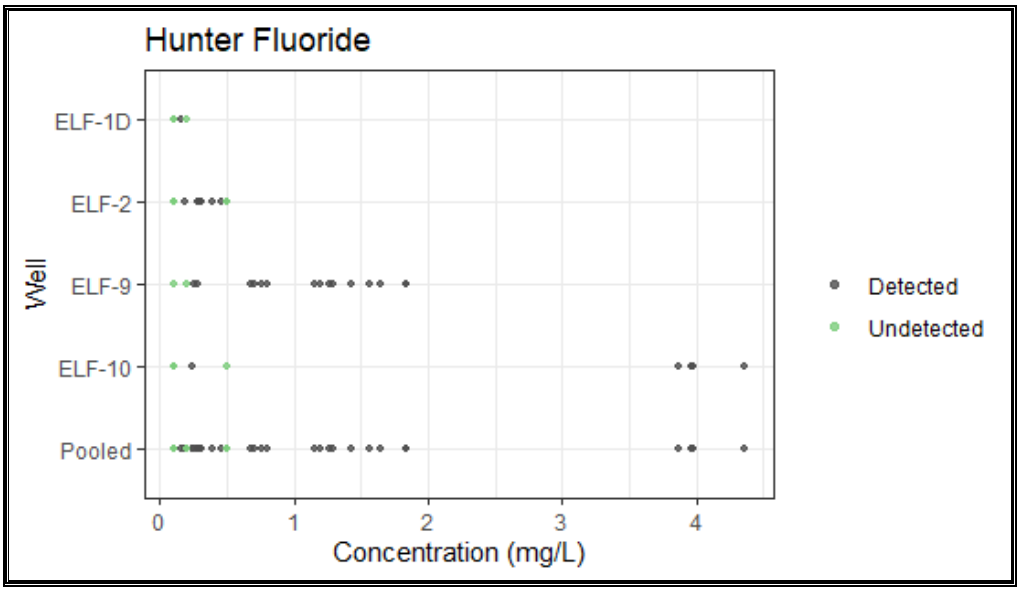

Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the arsenic, cadmium, chromium, fluoride, lead, and radium data for the CCR Landfill. However, only the arsenic and chromium outliers are extreme enough to warrant removal from the dataset. Figure C.5 shows the concentration of the arsenic outlier relative to the other observed arsenic concentrations. This outlier was not included in the Groundwater Protection Standard (GWPS) calculation because it would have resulted in an inflated GWPS. The MDLs for the non-detects in the boron upgradient data in February 2016 and August 2019 were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a GWPS that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix. The fluoride data for the May 2022 sampling event were all non-detects with unusually high detection limits so they were not included in the analysis. Fluoride was reassessed during the Spring 2023 sampling event and detection limits were within the normally expected ranges. Thus, the fluoride non-detects from the most recent sampling event is included in the calculations in this report.

2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The antimony, arsenic, cadmium, chromium, lead, and thallium data have more than 50% non-detects. Beryllium and mercury were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The cobalt, fluoride and selenium data have more than 15%

non-detects, but more than half of the data are detectable. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for cobalt, fluoride, and selenium.

2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary statistics were only computed for analytes and wells with at least 50% detects and at least eight positive results. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

Table C.2. Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Antimony	ELF-1D	5	0	<0.004	NA	NA	NA
Antimony	ELF-2	21	0	<0.002	NA	NA	NA
Antimony	ELF-9	19	3	<0.002	NA	NA	NA
Antimony	ELF-10	15	0	<0.002	NA	NA	NA
Antimony	Pooled	60	3	<0.002	NA	NA	NA
Arsenic	ELF-1D	5	0	<0.002	NA	NA	NA
Arsenic	ELF-2	21	3	<0.002	NA	NA	NA
Arsenic	ELF-9	19	19	0.0066	0.0067	0.0024	36
Arsenic	ELF-10	14	3	<0.002	NA	NA	NA
Arsenic	Pooled	59	25	<0.002	NA	NA	NA
Barium	ELF-1D	5	5	0.0103	NA	NA	NA
Barium	ELF-2	21	20	0.0102	0.0137	0.0096	70
Barium	ELF-9	19	19	0.0160	0.0330	0.0309	94
Barium	ELF-10	15	15	0.0353	0.0384	0.0214	56
Barium	Pooled	60	59	0.0136	0.0256	0.0237	93
Boron	ELF-1D	4	4	2.15	NA	NA	NA
Boron	ELF-2	20	20	3.29	3.31	0.19	6
Boron	ELF-9	17	17	1.36	1.43	0.21	15
Boron	ELF-10	14	14	1.60	1.63	0.18	11
Boron	Pooled	55	55	1.84	2.22	0.87	39
Cadmium	ELF-1D	5	0	<0.0005	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Cadmium	ELF-2	21	1	<0.0005	NA	NA	NA
Cadmium	ELF-9	19	1	<0.0005	NA	NA	NA
Cadmium	ELF-10	15	6	<0.0005	NA	NA	NA
Cadmium	Pooled	60	8	<0.0005	NA	NA	NA
Calcium	ELF-1D	4	4	372	NA	NA	NA
Calcium	ELF-2	20	20	397	395	24.3	6
Calcium	ELF-9	18	18	62.5	76.2	30.9	41
Calcium	ELF-10	14	14	477	479	35.5	7
Calcium	Pooled	56	56	389	312	170	55
Chloride	ELF-1D	4	4	6760	NA	NA	NA
Chloride	ELF-2	20	20	304	329	122	37
Chloride	ELF-9	18	18	381	392	100.7	26
Chloride	ELF-10	14	14	7600	8918	2506	28
Chloride	Pooled	56	56	452	2958	4034	136
Chromium	ELF-1D	5	1	<0.002	NA	NA	NA
Chromium	ELF-2	21	3	<0.002	NA	NA	NA
Chromium	ELF-9	19	7	<0.0036	NA	NA	NA
Chromium	ELF-10	15	11	0.003	0.0049	0.0039	81
Chromium	Pooled	60	22	<0.002	NA	NA	NA
Cobalt	ELF-1D	5	1	<0.004	NA	NA	NA
Cobalt	ELF-2	21	13	0.0048	0.0057	0.0026	45
Cobalt	ELF-9	19	5	<0.004	NA	NA	NA
Cobalt	ELF-10	15	11	0.0043	0.0049	0.0013	27
Cobalt	Pooled	60	30	0.004	0.0047	0.002	43
Fluoride	ELF-1D	4	1	<0.132	NA	NA	NA
Fluoride	ELF-2	19	9	<0.103	NA	NA	NA
Fluoride	ELF-9	17	15	1.16	1.00	0.58	58
Fluoride	ELF-10	14	5	<0.1	NA	NA	NA
Fluoride	Pooled	54	30	0.268	0.74	1.07	145
Lead	ELF-1D	5	0	<0.002	NA	NA	NA
Lead	ELF-2	21	2	<0.002	NA	NA	NA
Lead	ELF-9	19	4	<0.002	NA	NA	NA
Lead	ELF-10	15	6	<0.002	NA	NA	NA
Lead	Pooled	60	12	<0.002	NA	NA	NA
Lithium	ELF-1D	5	5	2.19	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Lithium	ELF-2	21	21	1.64	2.21	1.11	50
Lithium	ELF-9	19	19	1.03	1.05	0.41	39
Lithium	ELF-10	15	15	2.17	2.35	0.99	42
Lithium	Pooled	60	60	1.61	1.88	1.02	54
Molybdenum	ELF-1D	5	5	0.0161	NA	NA	NA
Molybdenum	ELF-2	21	20	0.003	0.0031	0.0007	24
Molybdenum	ELF-9	19	19	0.106	0.0937	0.0378	40
Molybdenum	ELF-10	15	15	0.0795	0.0735	0.0393	53
Molybdenum	Pooled	60	59	0.0336	0.0504	0.0494	98
pH	ELF-1D	4	4	7.22	NA	NA	NA
pH	ELF-2	20	20	7.26	7.30	0.157	2
pH	ELF-9	18	18	7.92	7.92	0.146	2
pH	ELF-10	14	14	7.18	7.26	0.411	6
pH	Pooled	56	56	7.37	7.48	0.387	5
Radium	ELF-1D	5	5	2.2	NA	NA	NA
Radium	ELF-2	21	21	1.63	1.97	1.58	80
Radium	ELF-9	19	18	1.5	1.49	0.563	38
Radium	ELF-10	15	15	2.41	3.02	3.24	107
Radium	Pooled	60	59	1.805	2.11	1.97	94
Selenium	ELF-1D	5	0	<0.002	NA	NA	NA
Selenium	ELF-2	21	21	0.0879	0.228	0.233	102
Selenium	ELF-9	19	4	<0.002	NA	NA	NA
Selenium	ELF-10	15	10	0.009	0.0983	0.139	142
Selenium	Pooled	60	35	0.0042	0.106	0.181	171
Sulfate	ELF-1D	4	4	8790	NA	NA	NA
Sulfate	ELF-2	20	20	7950	7764	690	9
Sulfate	ELF-9	18	18	6500	6518	723	11
Sulfate	ELF-10	14	14	14950	14718	4789	33
Sulfate	Pooled	56	56	7950	9190	4085	44
TDS	ELF-1D	4	4	26900	NA	NA	NA
TDS	ELF-2	20	20	12000	12010	459	4
TDS	ELF-9	18	18	10550	10640	803	8
TDS	ELF-10	14	14	38000	37443	2387	6
TDS	Pooled	56	56	12000	18990	11553	61
Thallium	ELF-1D	5	0	<0.002	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Thallium	ELF-2	21	1	<0.002	NA	NA	NA
Thallium	ELF-9	19	0	<0.002	NA	NA	NA
Thallium	ELF-10	15	0	<0.002	NA	NA	NA
Thallium	Pooled	60	1	<0.002	NA	NA	NA

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

Table C.3. Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Antimony	ELF-1D	<0.002	<0.004	<0.004	<0.004	<0.004
Antimony	ELF-2	<0.0005	<0.002	<0.002	<0.004	<0.004
Antimony	ELF-9	<0.0006	<0.002	<0.002	<0.004	0.004
Antimony	ELF-10	<0.001	<0.002	<0.002	<0.0033	<0.004
Antimony	Pooled	<0.0005	<0.002	<0.002	<0.004	0.004
Arsenic	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-2	<0.0007	<0.002	<0.002	<0.002	0.002
Arsenic	ELF-9	0.0025	0.0052	0.0066	0.0074	0.0117
Arsenic	ELF-10	<0.002	<0.002	<0.002	<0.002	0.0093
Arsenic	Pooled	<0.0007	<0.002	<0.002	0.0052	0.0117
Barium	ELF-1D	0.0084	0.0085	0.0103	0.0103	0.0104
Barium	ELF-2	<0.0084	0.0097	0.0102	0.012	0.050
Barium	ELF-9	0.0118	0.0127	0.0160	0.0379	0.102
Barium	ELF-10	0.0145	0.0195	0.0353	0.051	0.0863
Barium	Pooled	<0.0084	0.0104	0.0136	0.0334	0.102
Boron	ELF-1D	1.94	2.06	2.15	2.20	2.23
Boron	ELF-2	2.94	3.17	3.29	3.41	3.77
Boron	ELF-9	1.16	1.31	1.36	1.50	1.91
Boron	ELF-10	1.39	1.54	1.60	1.67	2.12
Boron	Pooled	1.16	1.50	1.84	3.21	3.77
Cadmium	ELF-1D	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Cadmium	ELF-2	<0.0002	<0.0005	<0.0005	<0.0005	0.0010
Cadmium	ELF-9	<0.0002	<0.0005	<0.0005	<0.0005	0.0005
Cadmium	ELF-10	<0.0005	<0.0005	<0.0005	0.0006	0.0011
Cadmium	Pooled	<0.0002	<0.0005	<0.0005	<0.0005	0.0011
Calcium	ELF-1D	353	363	372	381	393
Calcium	ELF-2	342	382	397	415	430
Calcium	ELF-9	48.9	57.1	62.5	86.2	166
Calcium	ELF-10	407	460	477	503	543
Calcium	Pooled	48.9	90.6	389	429	543
Chloride	ELF-1D	6430	6588	6760	6960	7200
Chloride	ELF-2	187	213	304	449	473
Chloride	ELF-9	242	320	381	460	595
Chloride	ELF-10	5710	7128	7600	11325	13100
Chloride	Pooled	187	308	452	6813	13100
Chromium	ELF-1D	<0.002	<0.002	<0.002	<0.002	0.0023
Chromium	ELF-2	<0.001	<0.002	<0.002	<0.002	0.066
Chromium	ELF-9	<0.002	<0.002	<0.0036	0.0054	0.0201
Chromium	ELF-10	<0.002	<0.002	0.003	0.0061	0.0164
Chromium	Pooled	<0.001	<0.002	<0.002	0.005	0.066
Cobalt	ELF-1D	<0.004	<0.004	<0.004	<0.004	0.0054
Cobalt	ELF-2	<0.0032	<0.004	0.0048	0.006	0.0131
Cobalt	ELF-9	<0.0005	<0.004	<0.004	0.004	0.0052
Cobalt	ELF-10	<0.004	<0.004	0.0043	0.0052	0.0079
Cobalt	Pooled	<0.0005	<0.004	0.004	0.0051	0.0131
Fluoride	ELF-1D	<0.1	<0.1	<0.1315	0.1723	0.200
Fluoride	ELF-2	<0.1	<0.1	<0.103	0.3515	0.500
Fluoride	ELF-9	<0.1	0.678	1.16	1.43	1.84
Fluoride	ELF-10	<0.1	<0.1	<0.1	3.03	4.36
Fluoride	Pooled	<0.1	<0.1	0.268	0.788	4.36
Lead	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	ELF-2	<0.0005	<0.002	<0.002	<0.002	0.0021
Lead	ELF-9	<0.0005	<0.002	<0.002	<0.002	0.0077
Lead	ELF-10	<0.002	<0.002	<0.002	0.0028	0.012
Lead	Pooled	<0.0005	<0.002	<0.002	<0.002	0.012
Lithium	ELF-1D	1.96	2.12	2.19	2.2	2.89
Lithium	ELF-2	1.34	1.52	1.64	2.14	4.93

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Lithium	ELF-9	0.724	0.792	1.03	1.08	2.48
Lithium	ELF-10	0.841	1.82	2.17	2.90	4.59
Lithium	Pooled	0.724	1.08	1.61	2.18	4.93
Molybdenum	ELF-1D	0.0087	0.0153	0.0161	0.0165	0.0207
Molybdenum	ELF-2	<0.002	0.0027	0.003	0.0034	0.005
Molybdenum	ELF-9	0.0322	0.0614	0.106	0.123	0.158
Molybdenum	ELF-10	0.0131	0.0428	0.0795	0.111	0.124
Molybdenum	Pooled	<0.002	0.0033	0.0336	0.100	0.158
pH	ELF-1D	7.02	7.13	7.22	7.28	7.30
pH	ELF-2	7.12	7.20	7.26	7.41	7.76
pH	ELF-9	7.51	7.87	7.92	8.03	8.19
pH	ELF-10	6.85	6.99	7.18	7.38	8.37
pH	Pooled	6.85	7.20	7.37	7.87	8.37
Radium	ELF-1D	1.09	1.23	2.2	2.63	4.4
Radium	ELF-2	0.61	0.99	1.63	2.29	8.1
Radium	ELF-9	<0.64	1.15	1.5	1.88	2.6
Radium	ELF-10	0.46	1.67	2.41	3.14	14.2
Radium	Pooled	<0.46	1.13	1.805	2.40	14.2
Selenium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	ELF-2	0.0031	0.0084	0.0879	0.451	0.608
Selenium	ELF-9	<0.0012	<0.002	<0.002	<0.002	0.0095
Selenium	ELF-10	<0.002	<0.002	0.009	0.152	0.410
Selenium	Pooled	<0.0012	<0.002	0.0042	0.115	0.608
Sulfate	ELF-1D	7730	8413	8790	9380	10700
Sulfate	ELF-2	6030	7310	7950	8215	8720
Sulfate	ELF-9	5460	5855	6500	7035	8030
Sulfate	ELF-10	8610	10075	14950	19675	20700
Sulfate	Pooled	5460	6845	7950	9013	20700
TDS	ELF-1D	25000	26350	26900	27425	28700
TDS	ELF-2	11300	11675	12000	12300	13100
TDS	ELF-9	9420	10150	10550	11125	12000
TDS	ELF-10	32900	35750	38000	39350	40300
TDS	Pooled	9420	11275	12000	29750	40300
Thallium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	ELF-2	<0.0002	<0.002	<0.002	<0.002	0.002
Thallium	ELF-9	<0.0002	<0.002	<0.002	<0.002	<0.002

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Thallium	ELF-10	<0.001	<0.002	<0.002	<0.002	<0.002
Thallium	Pooled	<0.0002	<0.002	<0.002	<0.002	0.002

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results
- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

$\bar{X}$ = the average of the background data
κ = multiplier from EPA Unified Guidance, March 2009
S = standard deviation of the background data

3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals that outliers are present in the data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

Note: The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison.

A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium, pH, and radium. Non-parametric UTLs were computed for all of the analytes except for lithium, pH, and radium.

Table C.4. Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7183	<0.0001	No
Boron	0.8324	<0.0001	No
Calcium	0.8107	<0.0001	No
Chloride	0.6877	<0.0001	No
Cobalt	0.7405	<0.0001	No
Fluoride	0.6345	<0.0001	No
Lithium	0.8728	<0.0001	No
Cube Root of Lithium	0.9487	0.0136	Yes
Molybdenum	0.8435	<0.0001	No
pH	0.9295	0.0028	No
Cube Root of pH	0.9325	0.0038	Yes
Radium	0.5609	<0.0001	No
LN of Radium	0.9604	0.0490	Yes

Analyte	W-Statistic	P-Value	Normal
Selenium	0.6272	<0.0001	No
Sulfate	0.7074	<0.0001	No
TDS	0.7016	<0.0001	No

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

- If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.
- If the data were not normally distributed or more than 50% of the data were non-detects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 shows graphs that were constructed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS. Results above the GWPS line represent values exceeding the GWPS.

As the graphs illustrate, boron, cobalt, lithium, and molybdenum exceeded site-specific background or the GWPS. Table C.5 lists site-specific background values, maximum contaminant limits MCLs, the GWPS and the wells that exceed the GWPS for each analyte. GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient wells to the Groundwater Protection Standard

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.0025	0.004	0.004	Within Limit
Boron[a]	3.77	NA	3.77	ELF-4, ELF-5R, ELF-6R, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit
Calcium	543	NA	543	Within Limit
Chloride	13100	NA	13100	Within Limit
Chromium	0.066	0.1000	0.1000	Within Limit
Cobalt	0.0131	0.006	0.0131	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.22	0.04	4.22	ELF-6R
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.56	NA	6.56	Within Limit
pH Basic Range	8.48	NA	8.48	Within Limit
Radium	6.1	5.0	6.1	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

[a] New monitoring well ELF-16 exhibited concentrations in excess of the background UTL for boron and the GWPS for lithium. ELF-16 was installed in 2022 as a boundary well for the landfill and as yet does not have eight independent measurements. As a result, it is not shown in Table C.5.

4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were done correctly. During the Spring 2023 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituents:

- Boron

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Cobalt
- Lithium
- Molybdenum

5.0 REFERENCES

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Helsel, Dennis, 2004, *Nondetects and Data Analysis: Statistic for Censored Environmental Data*, New York: Wiley Interscience.

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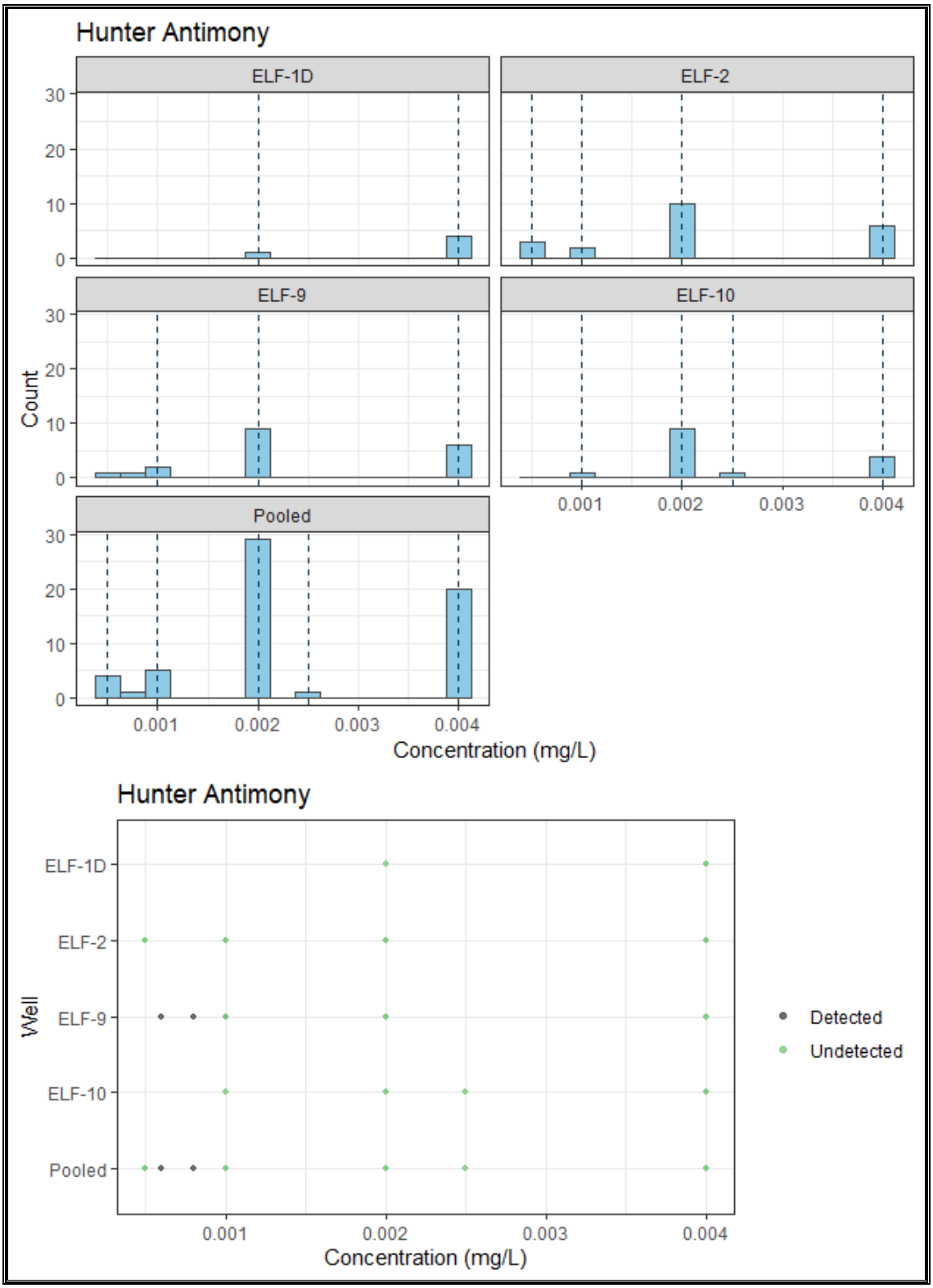


Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

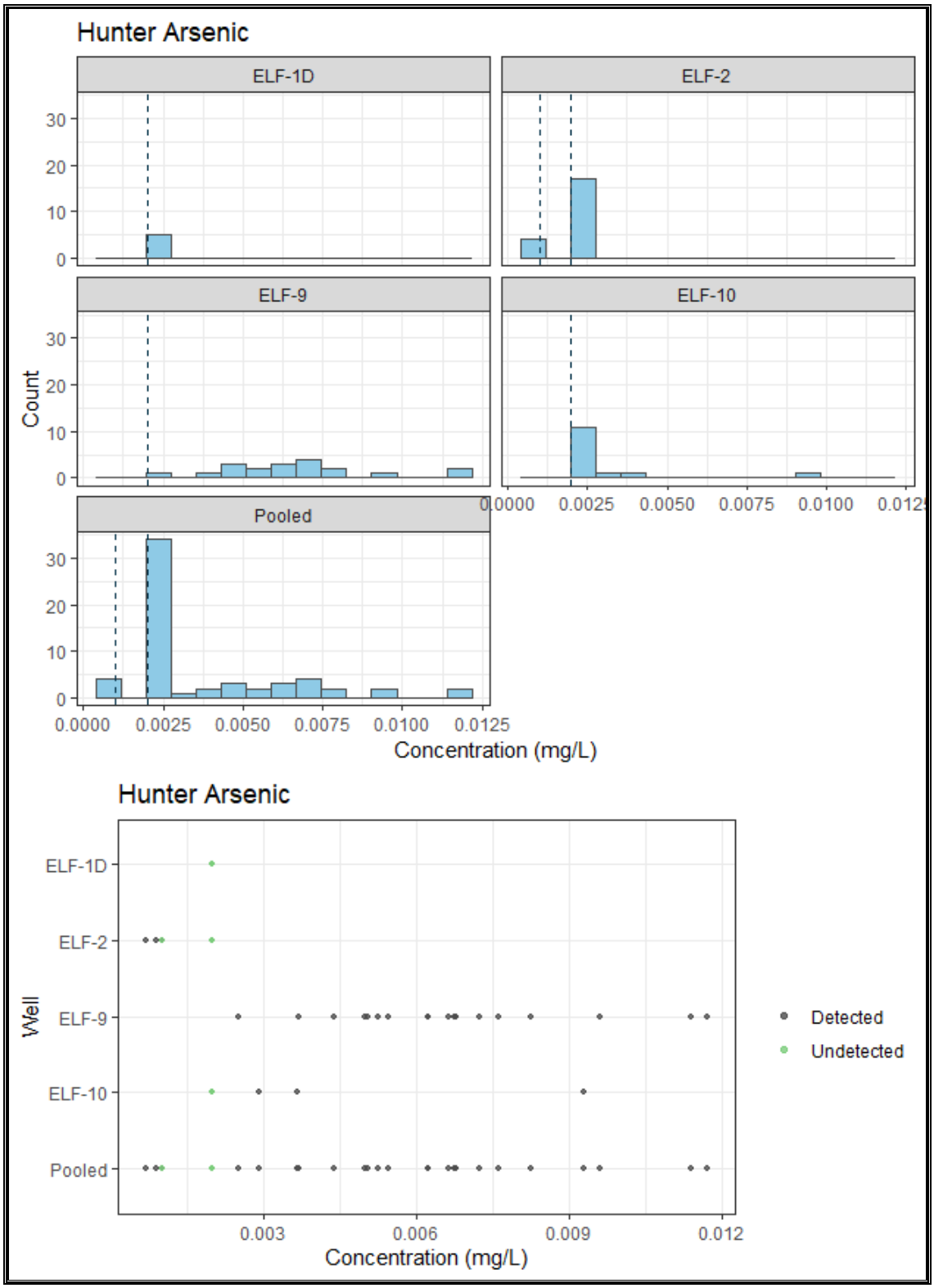


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

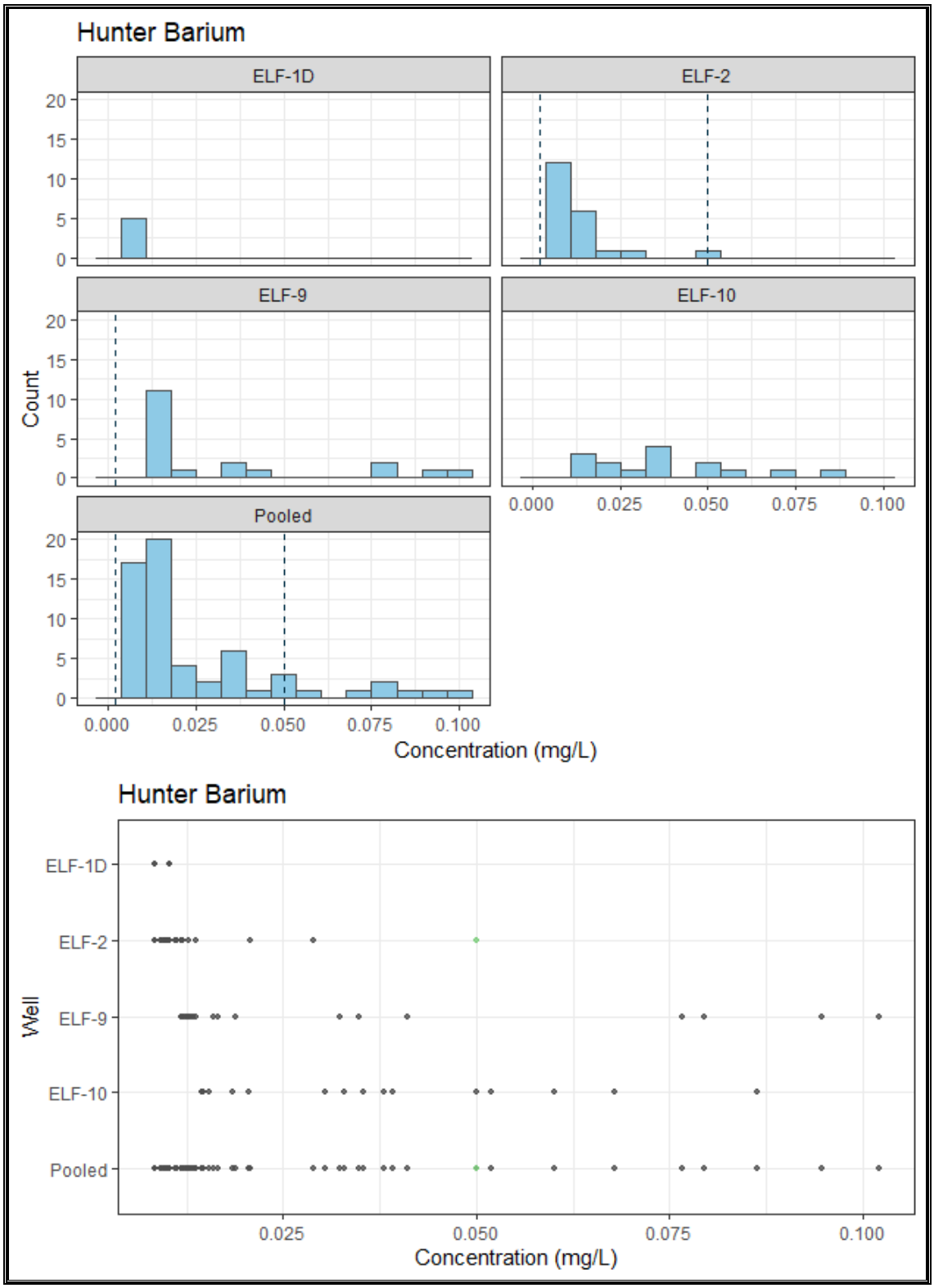


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

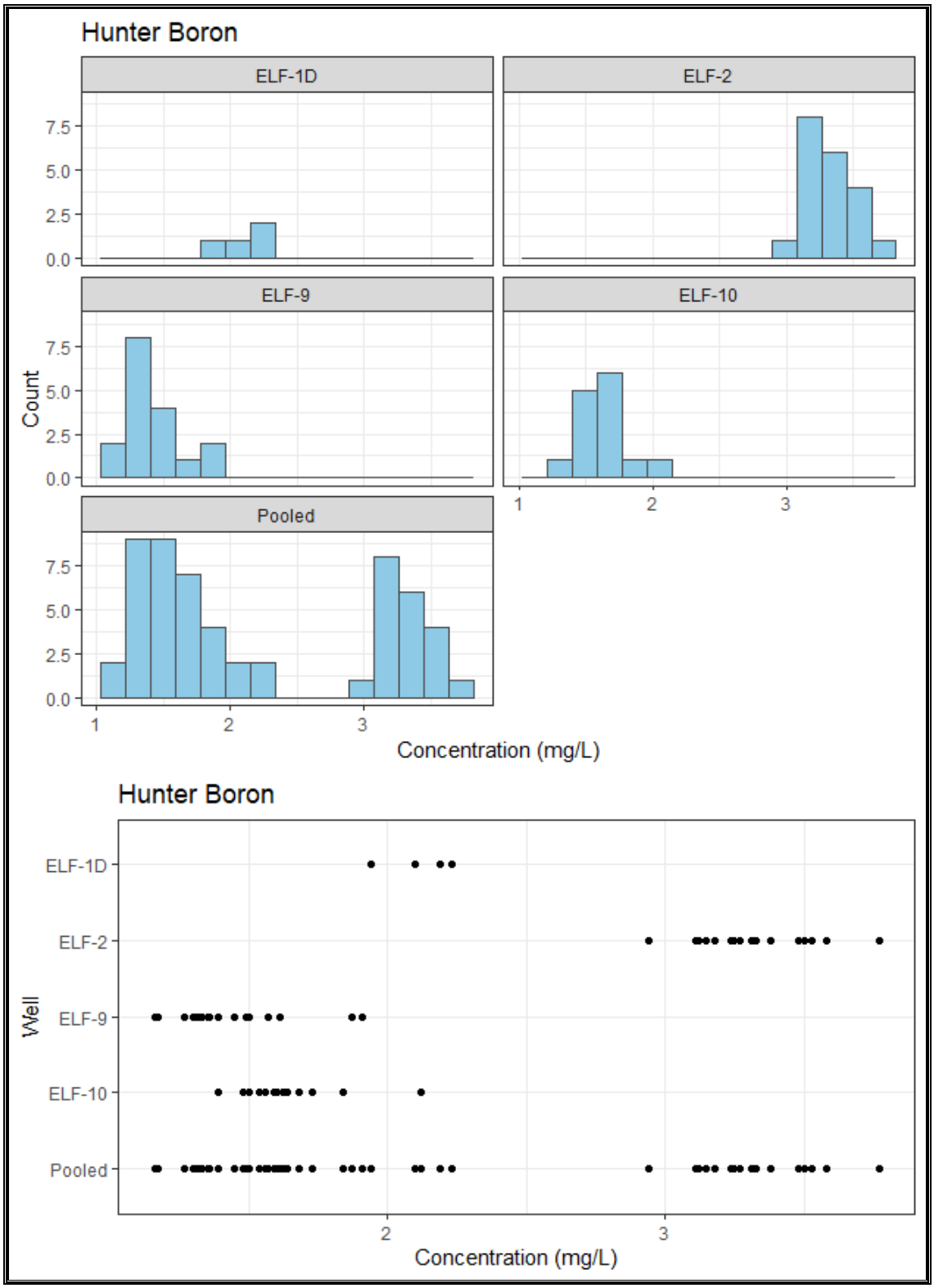


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

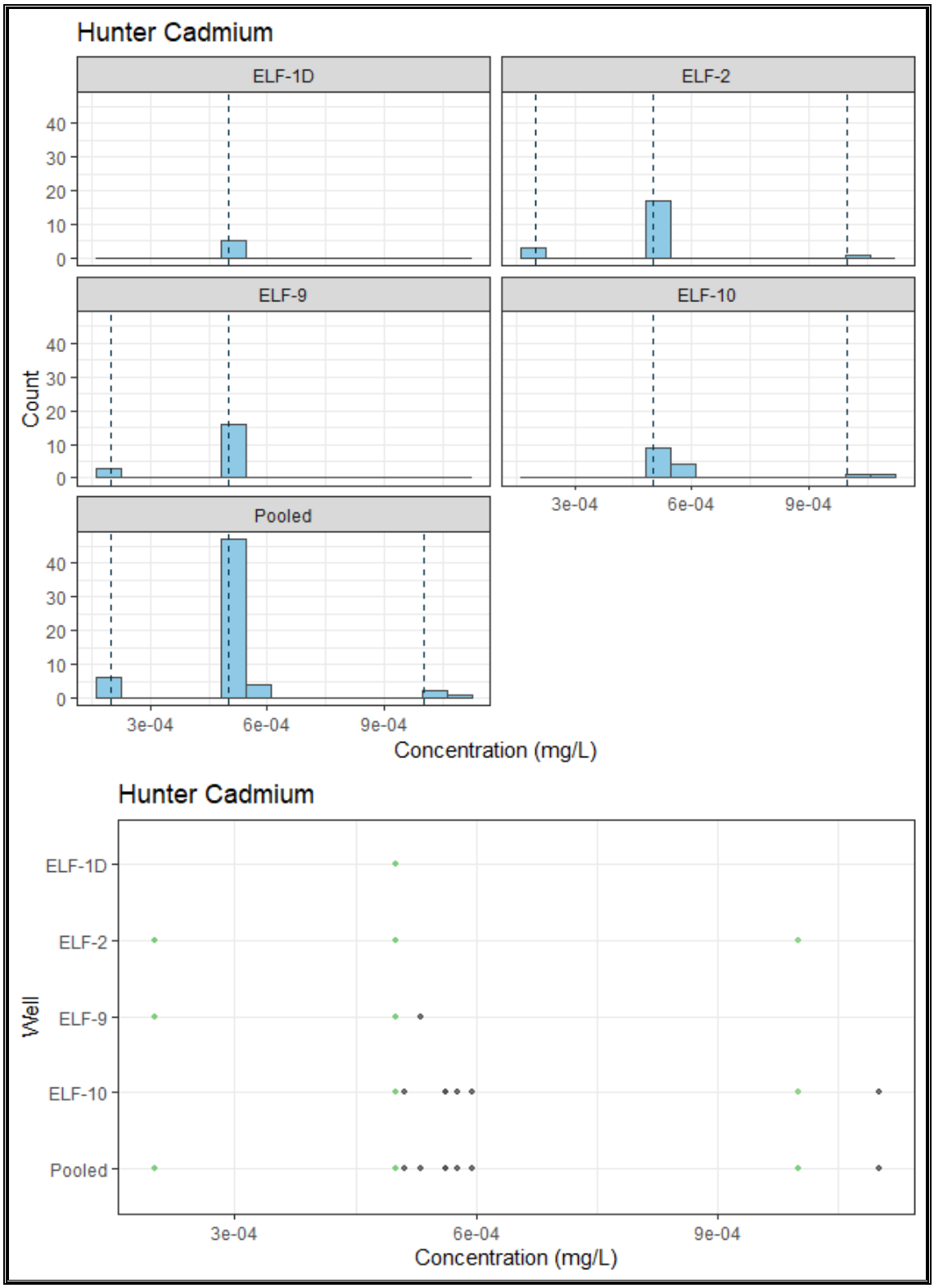
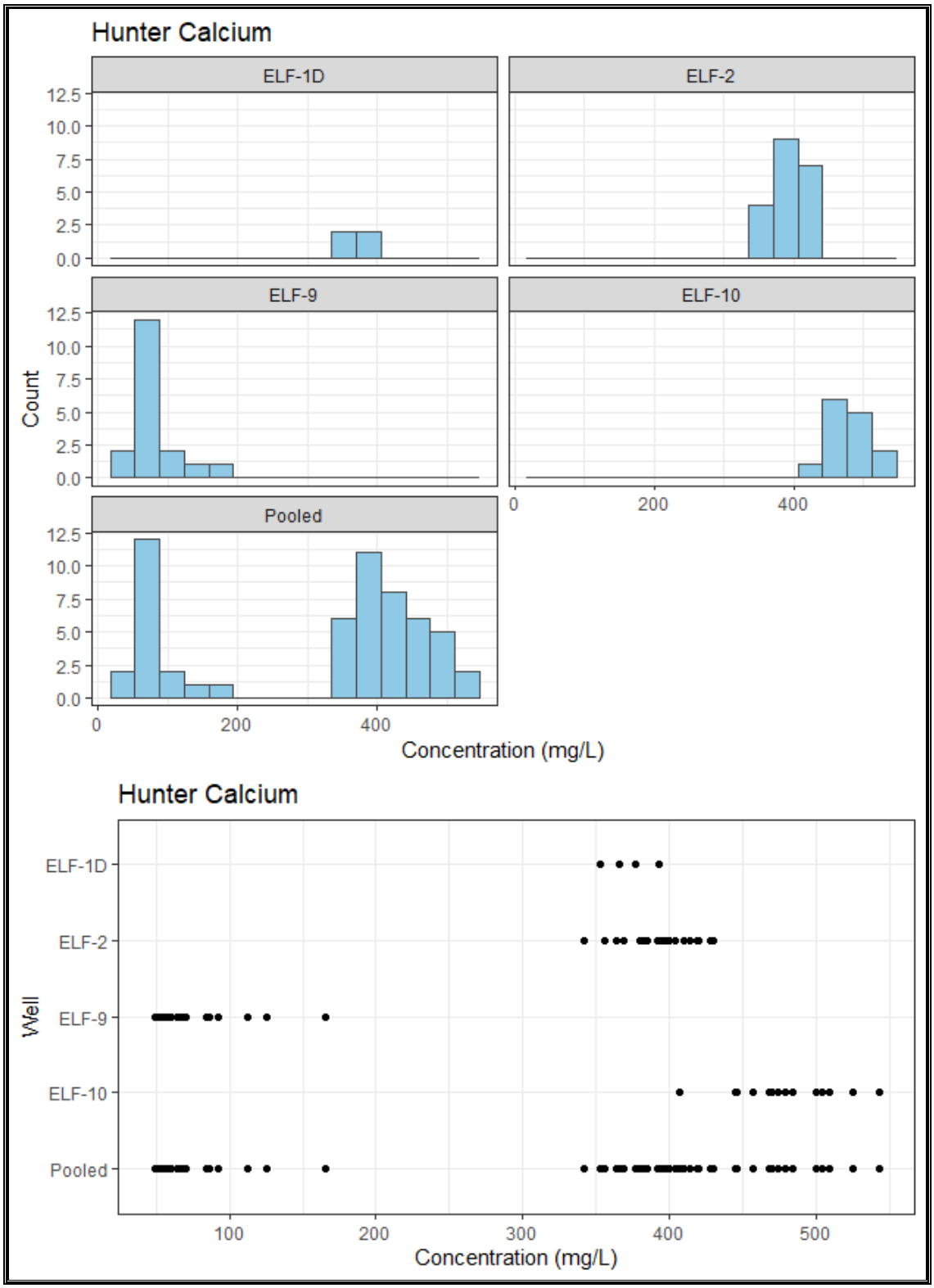


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.



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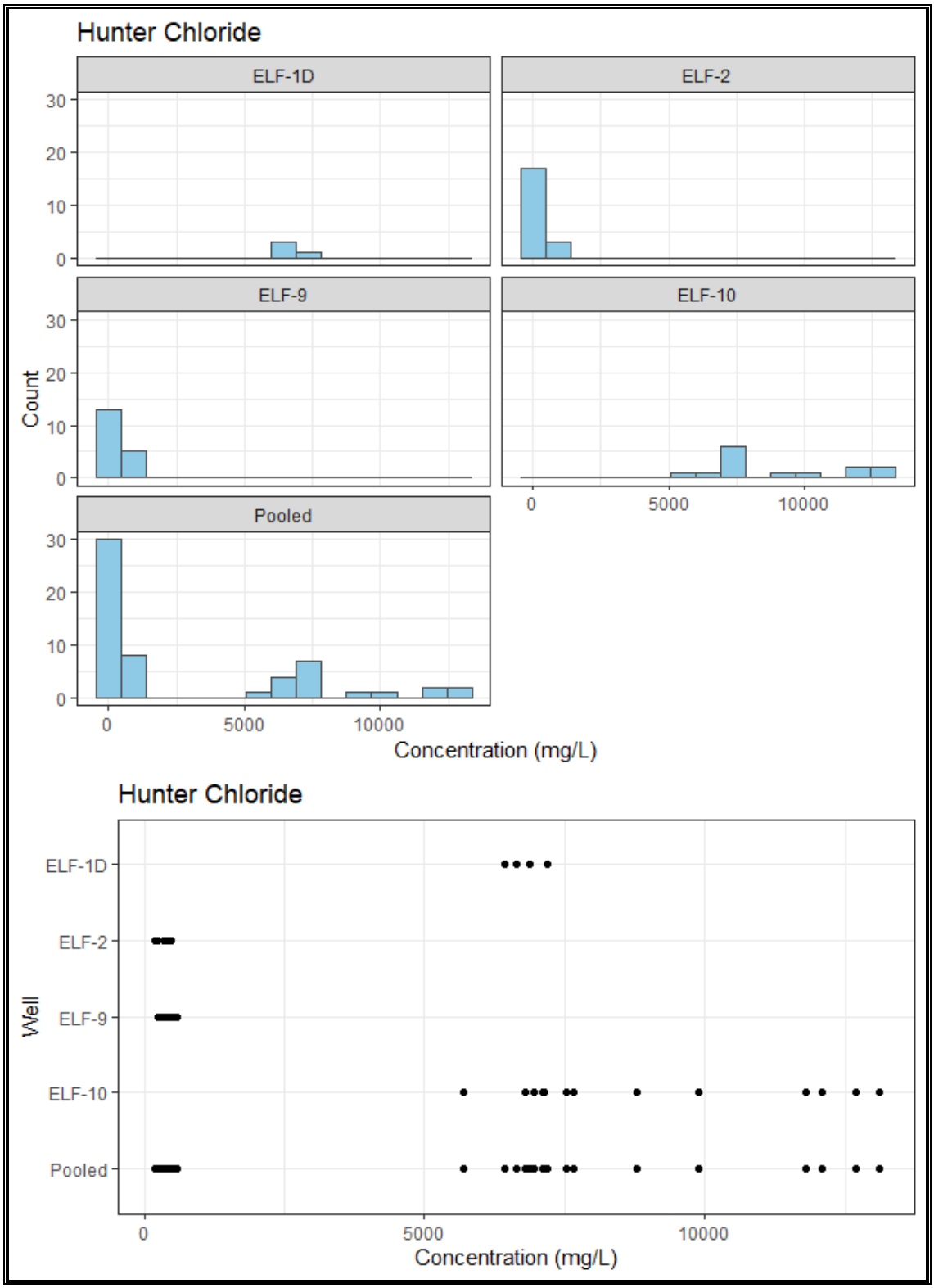

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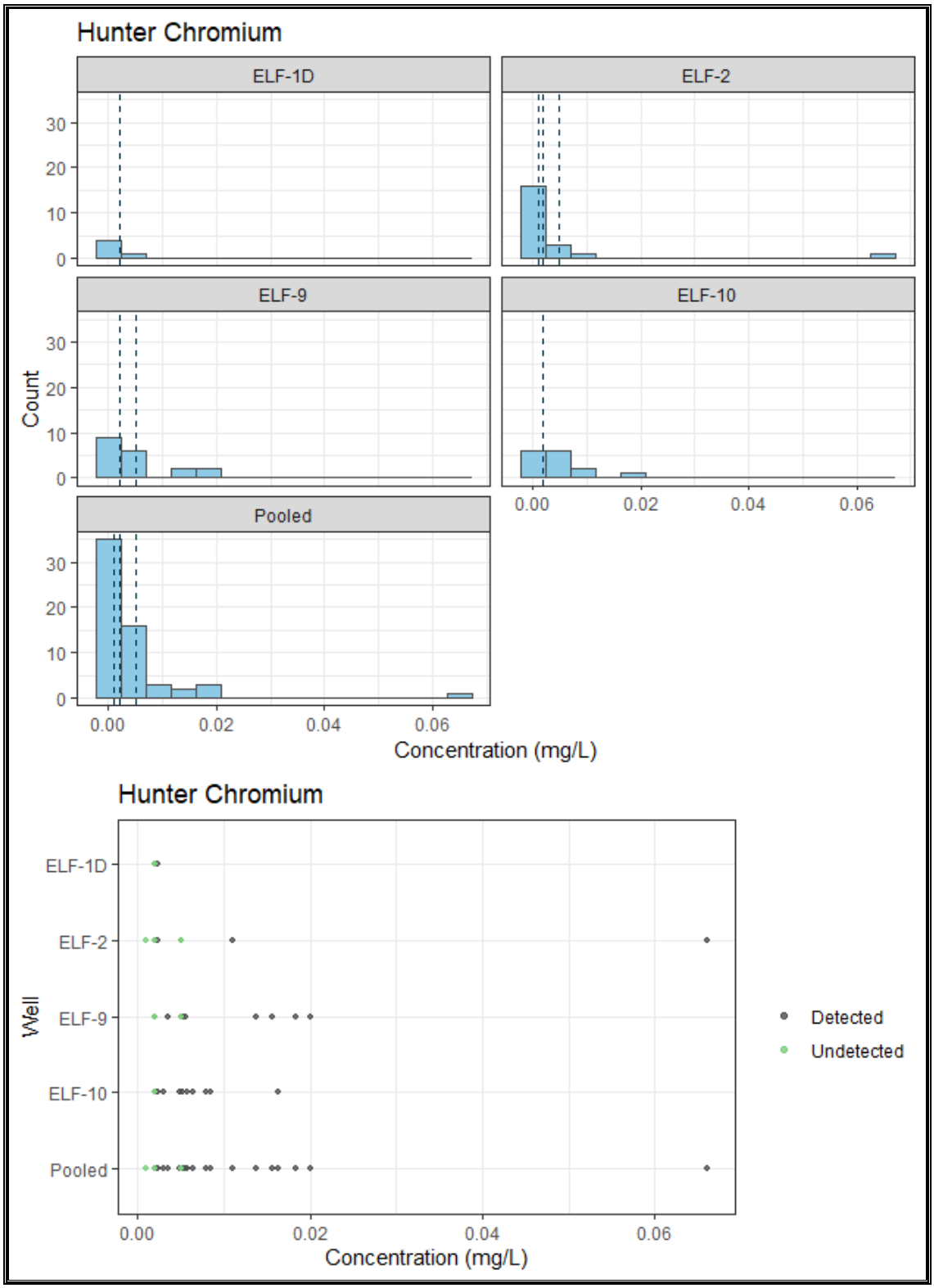
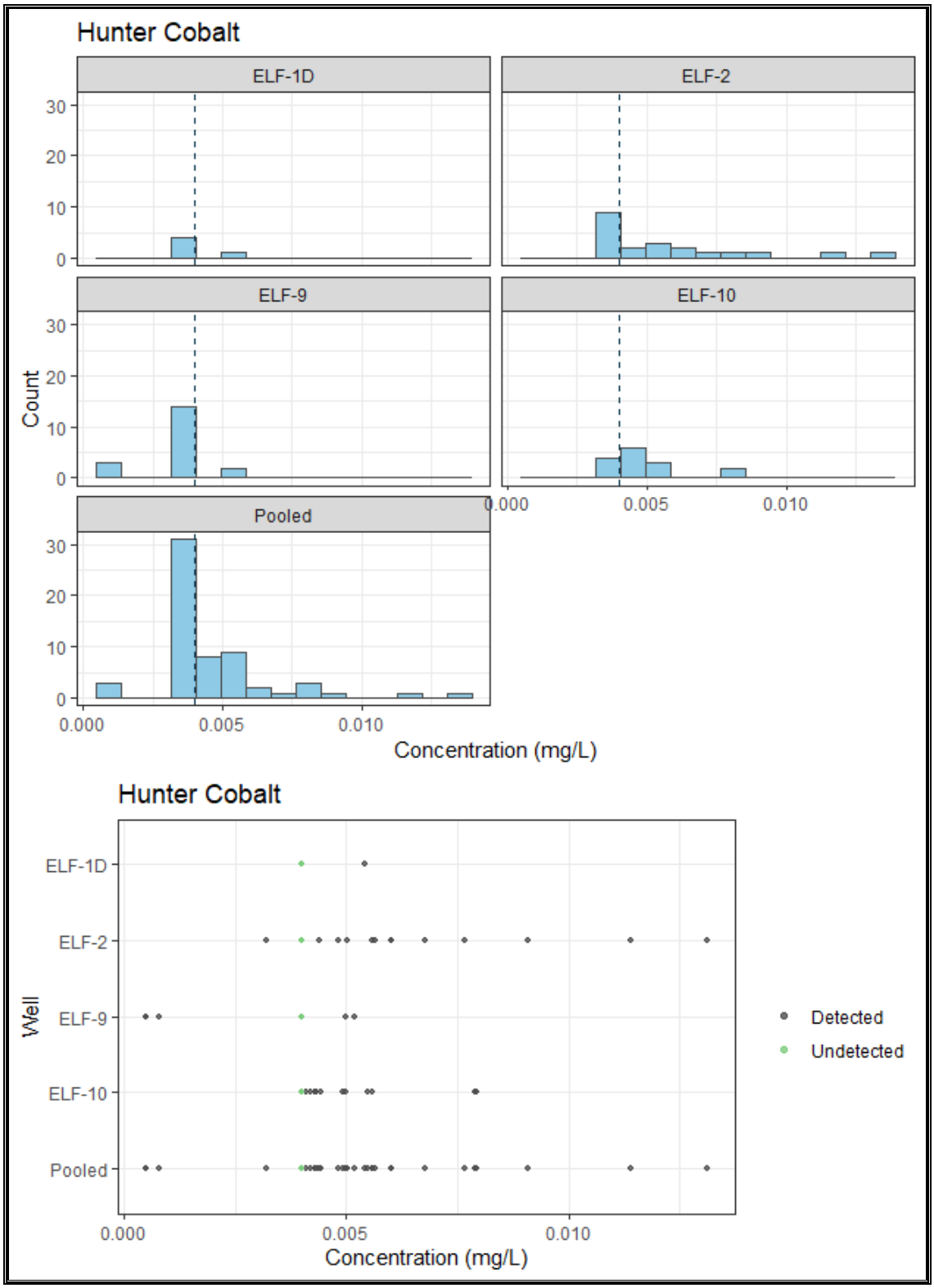


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.



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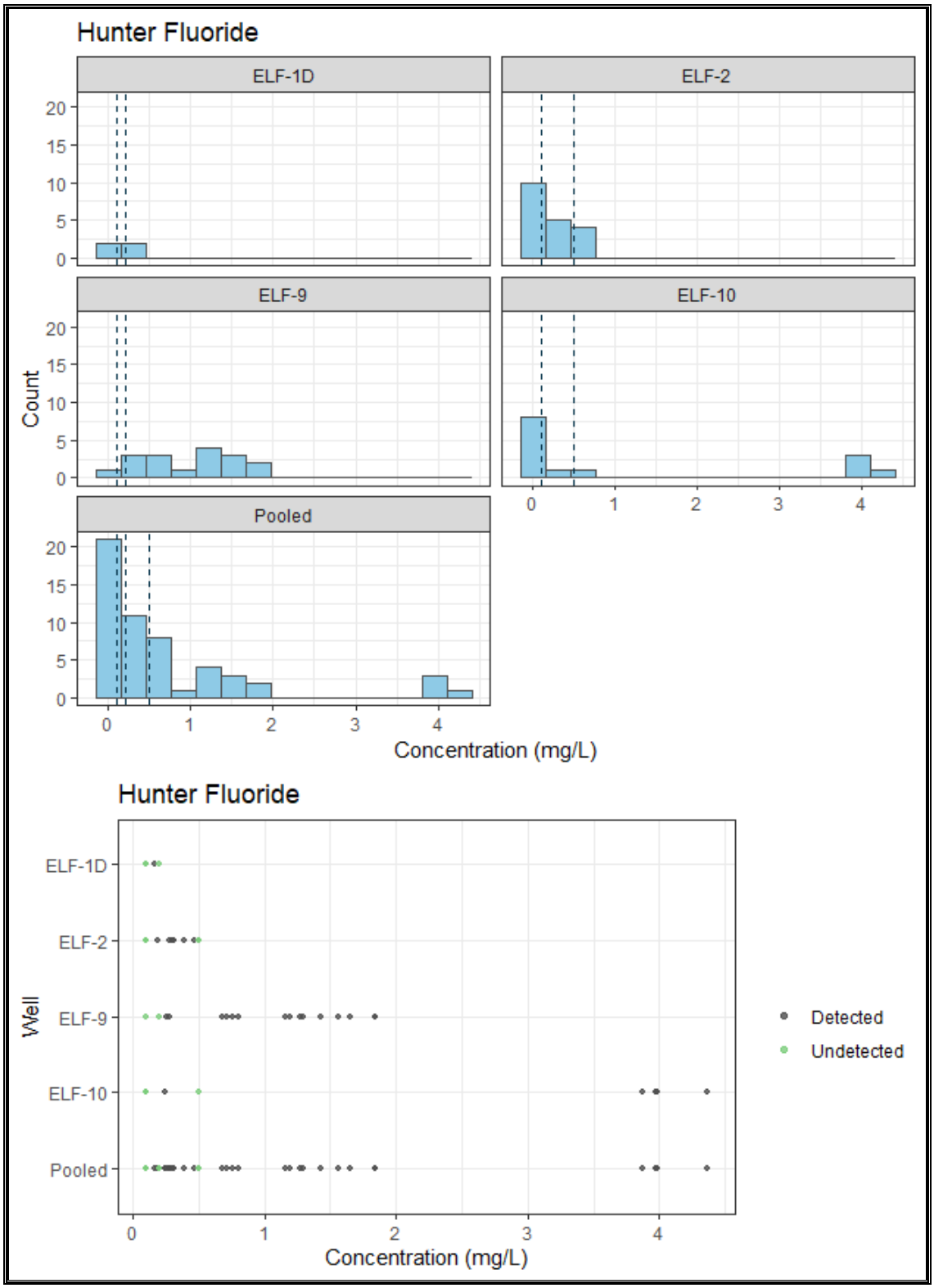

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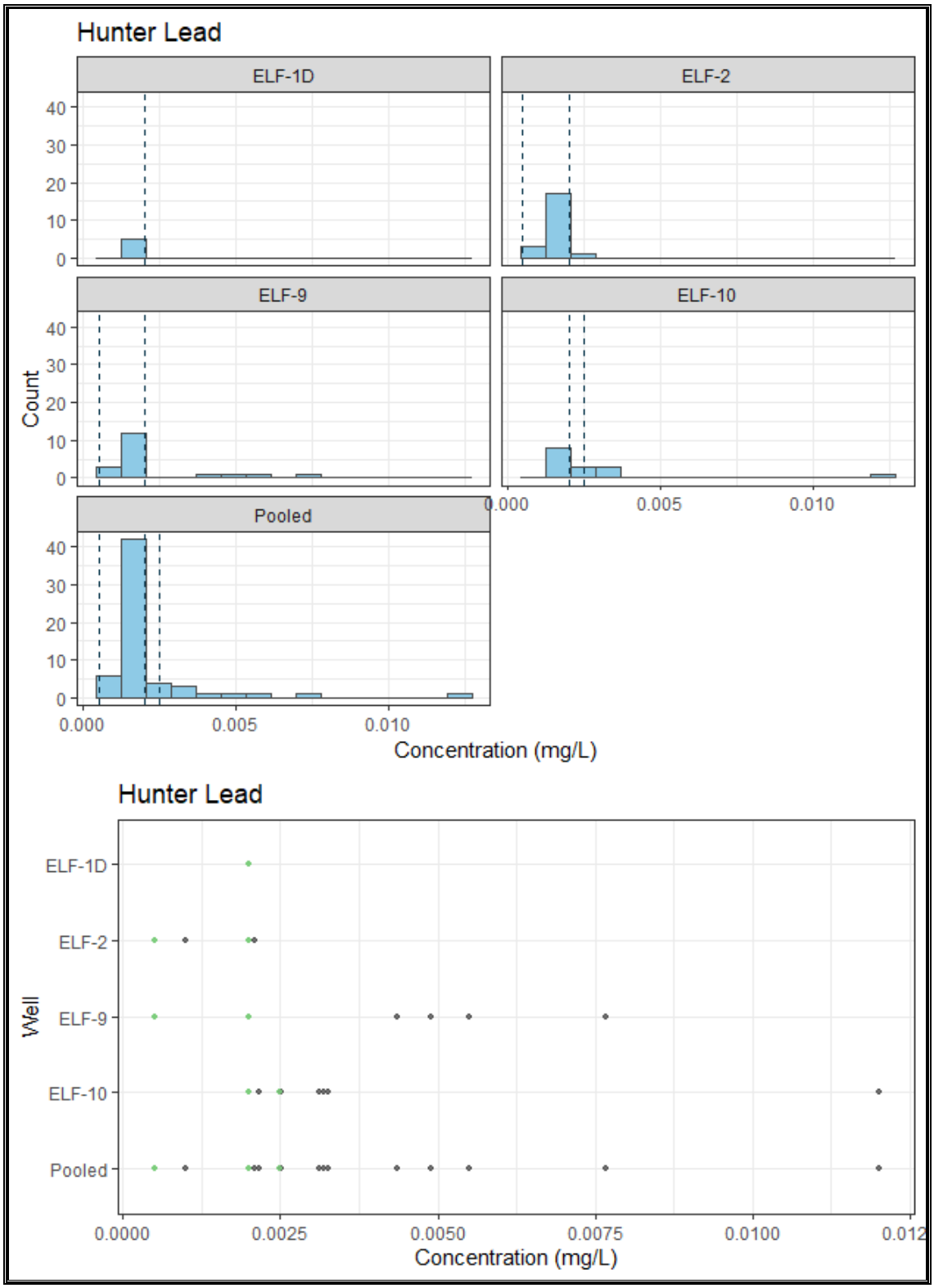

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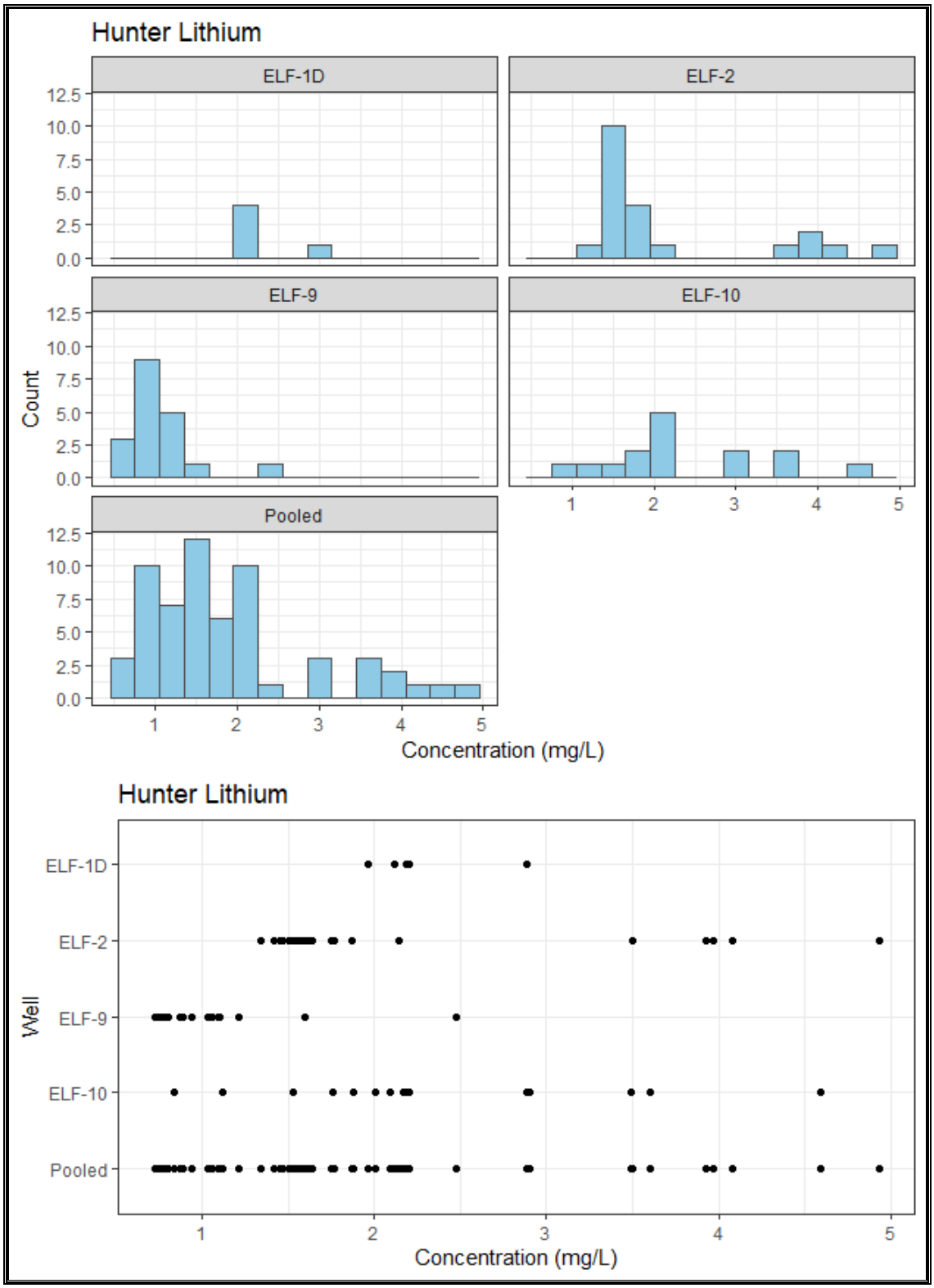

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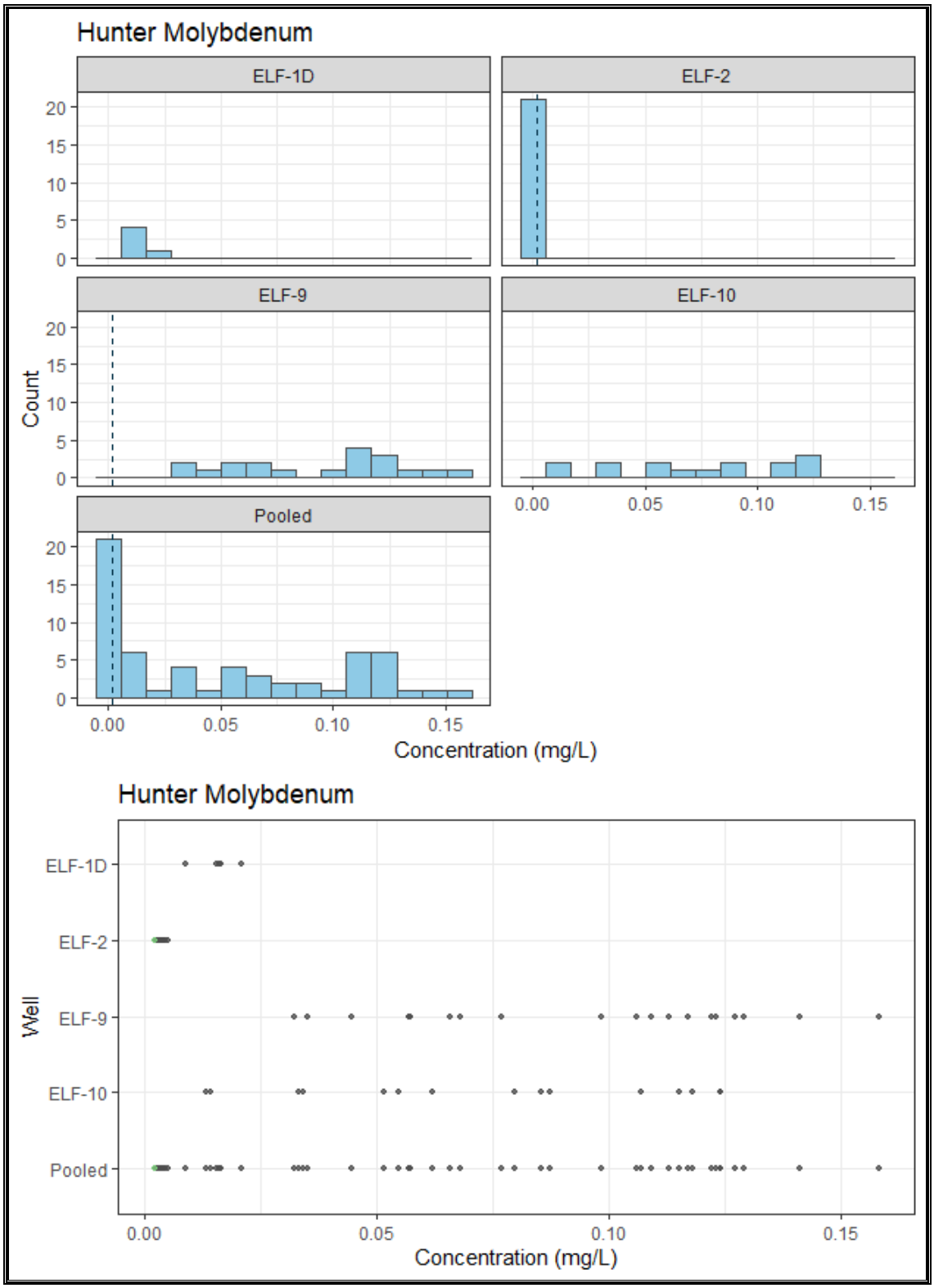

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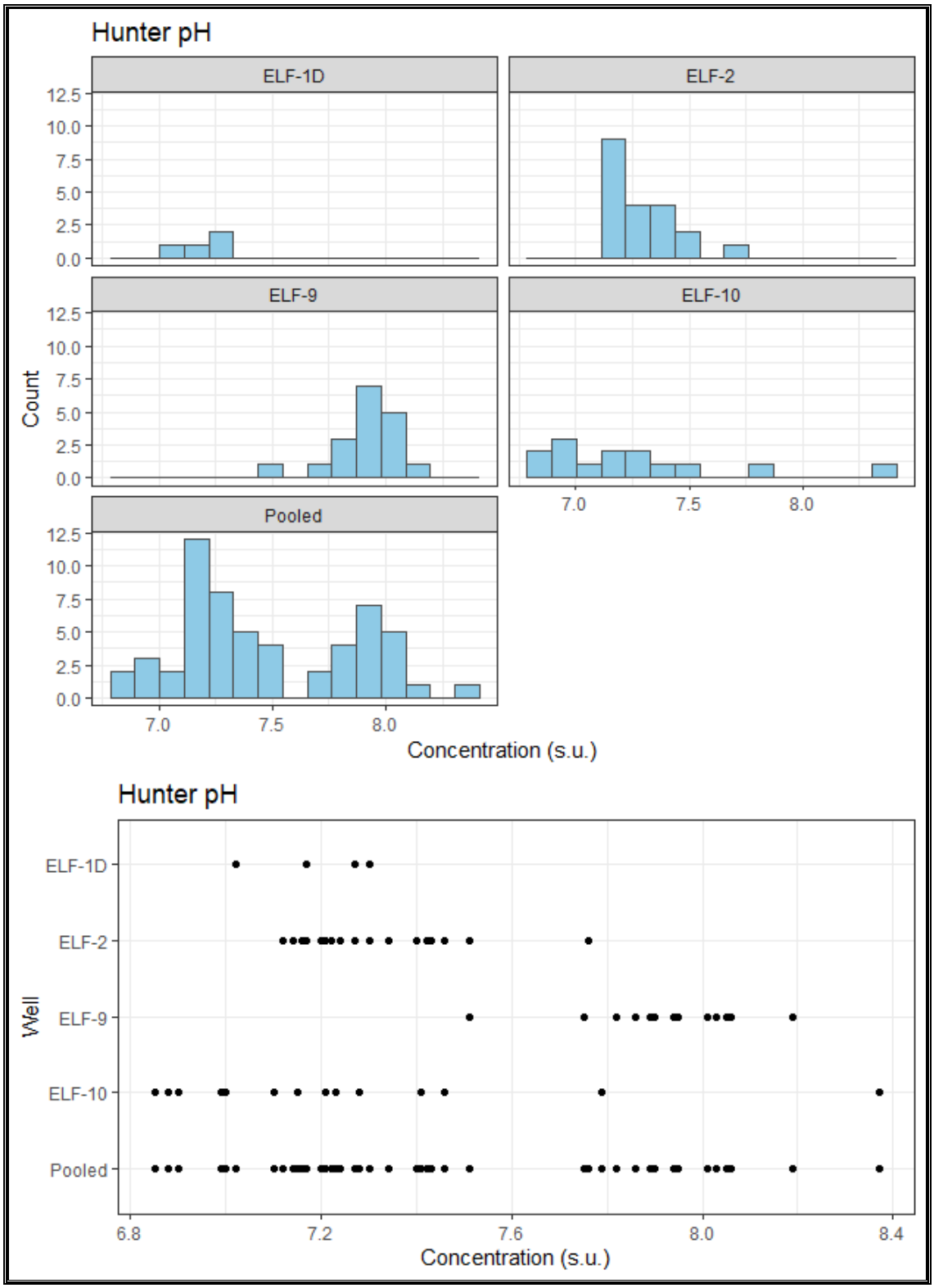

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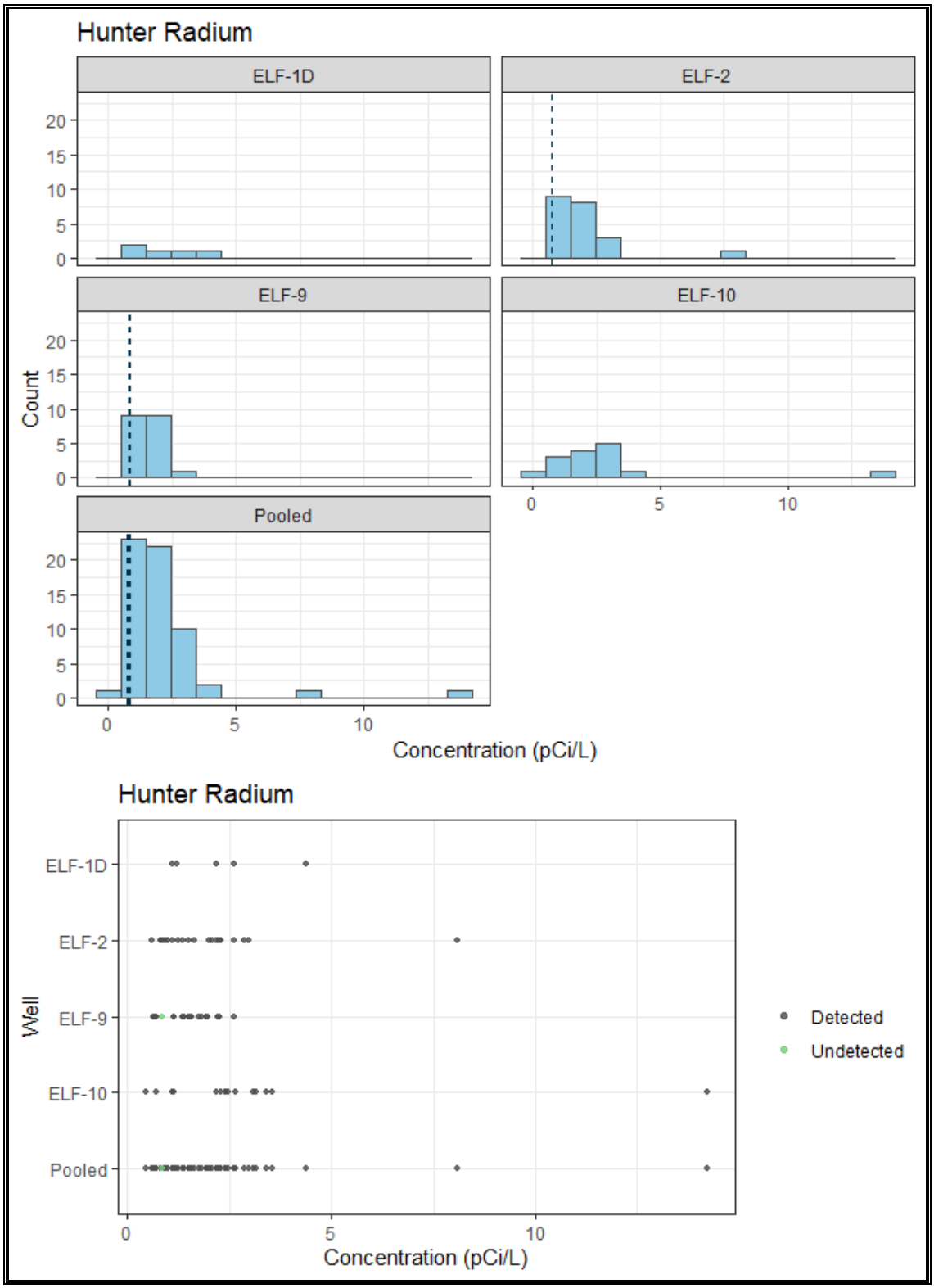

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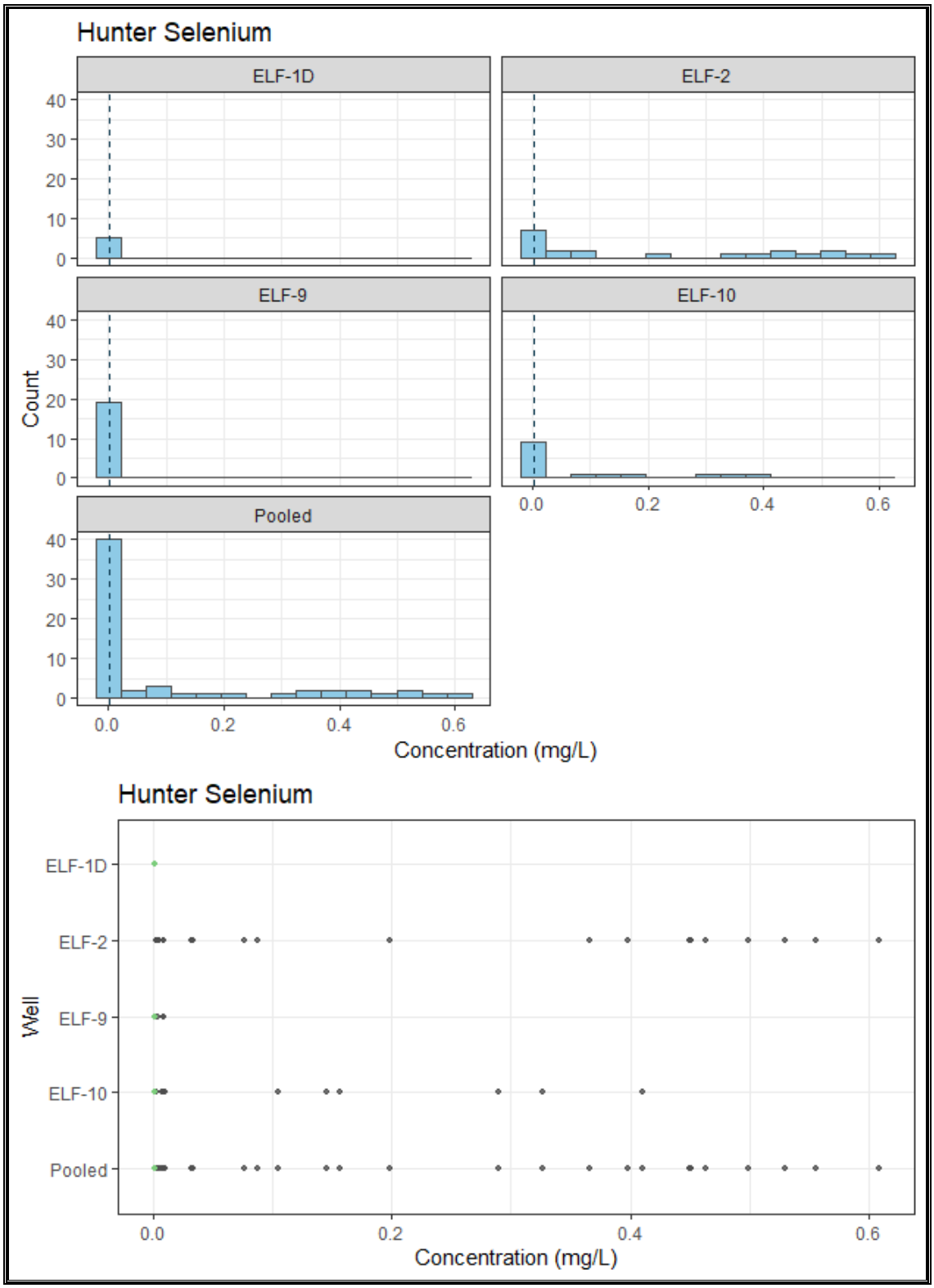

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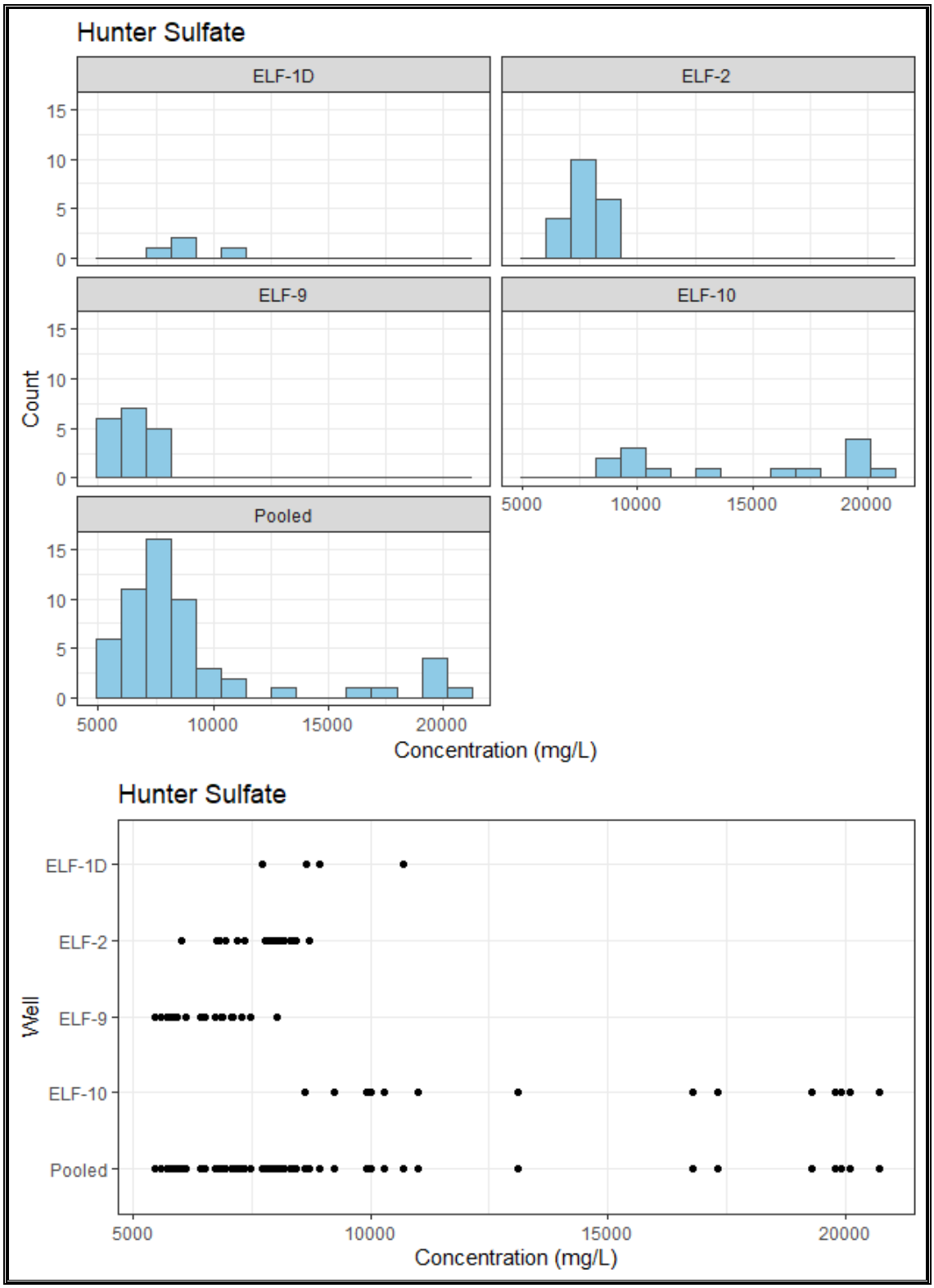

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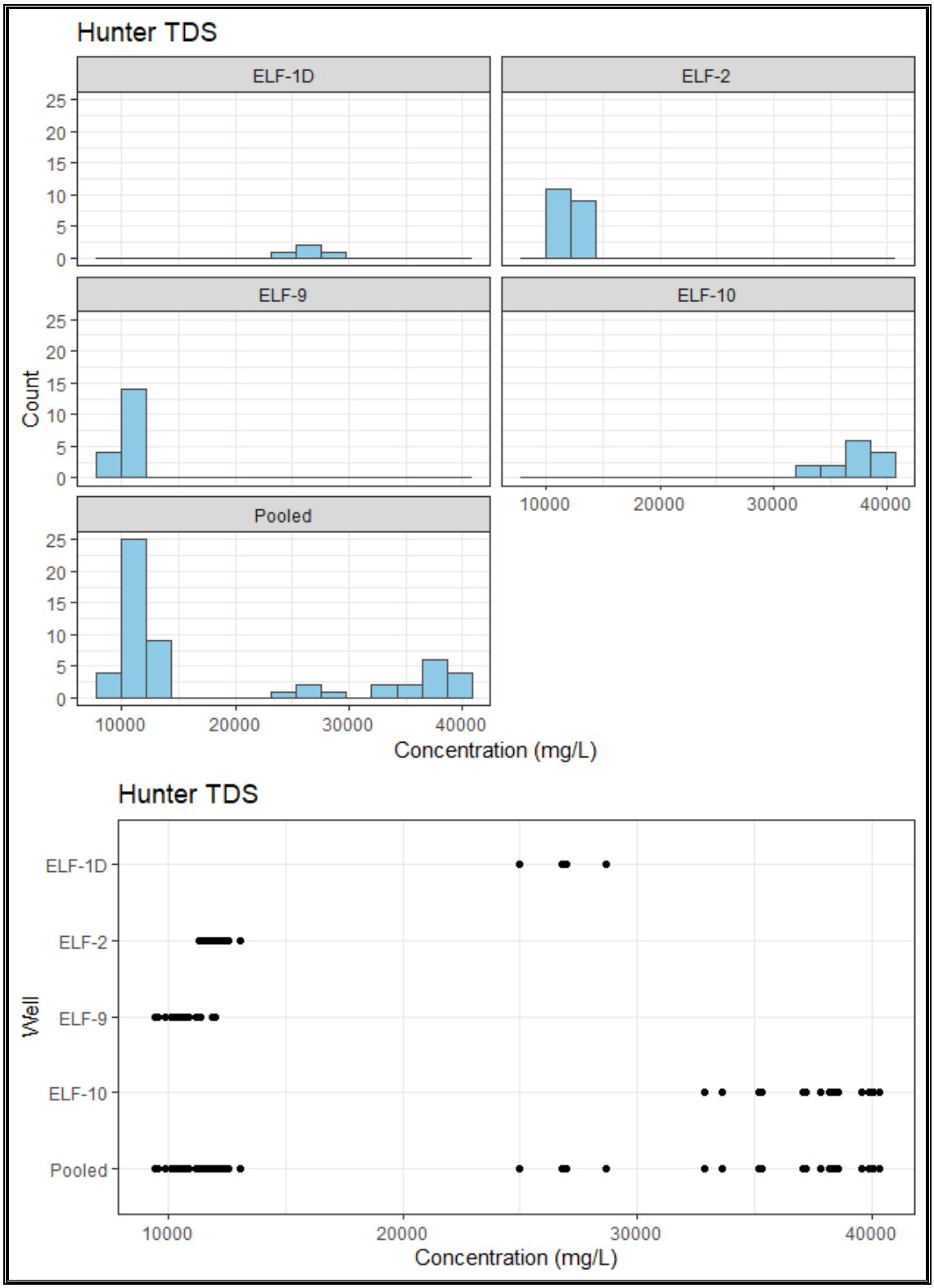

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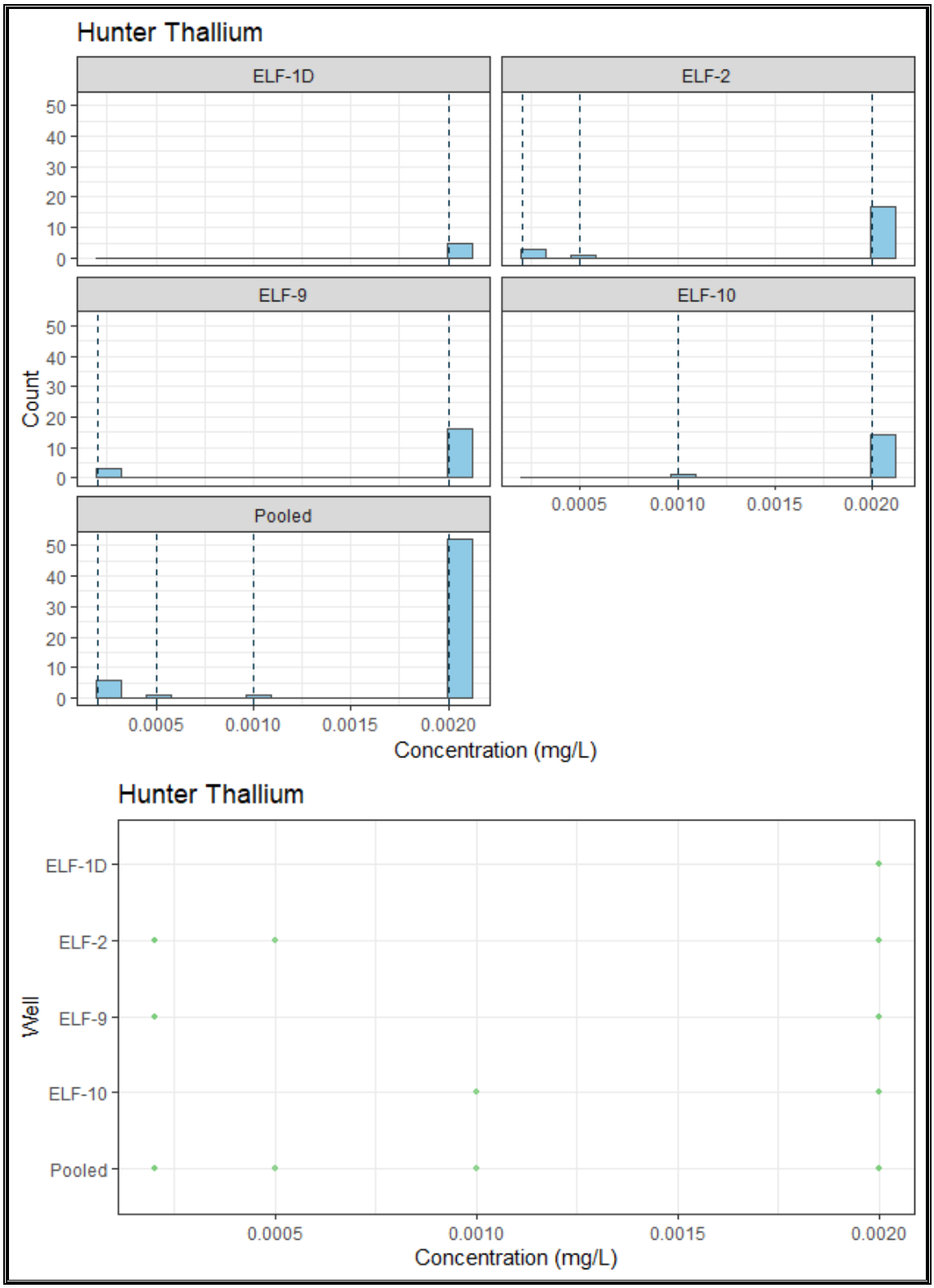

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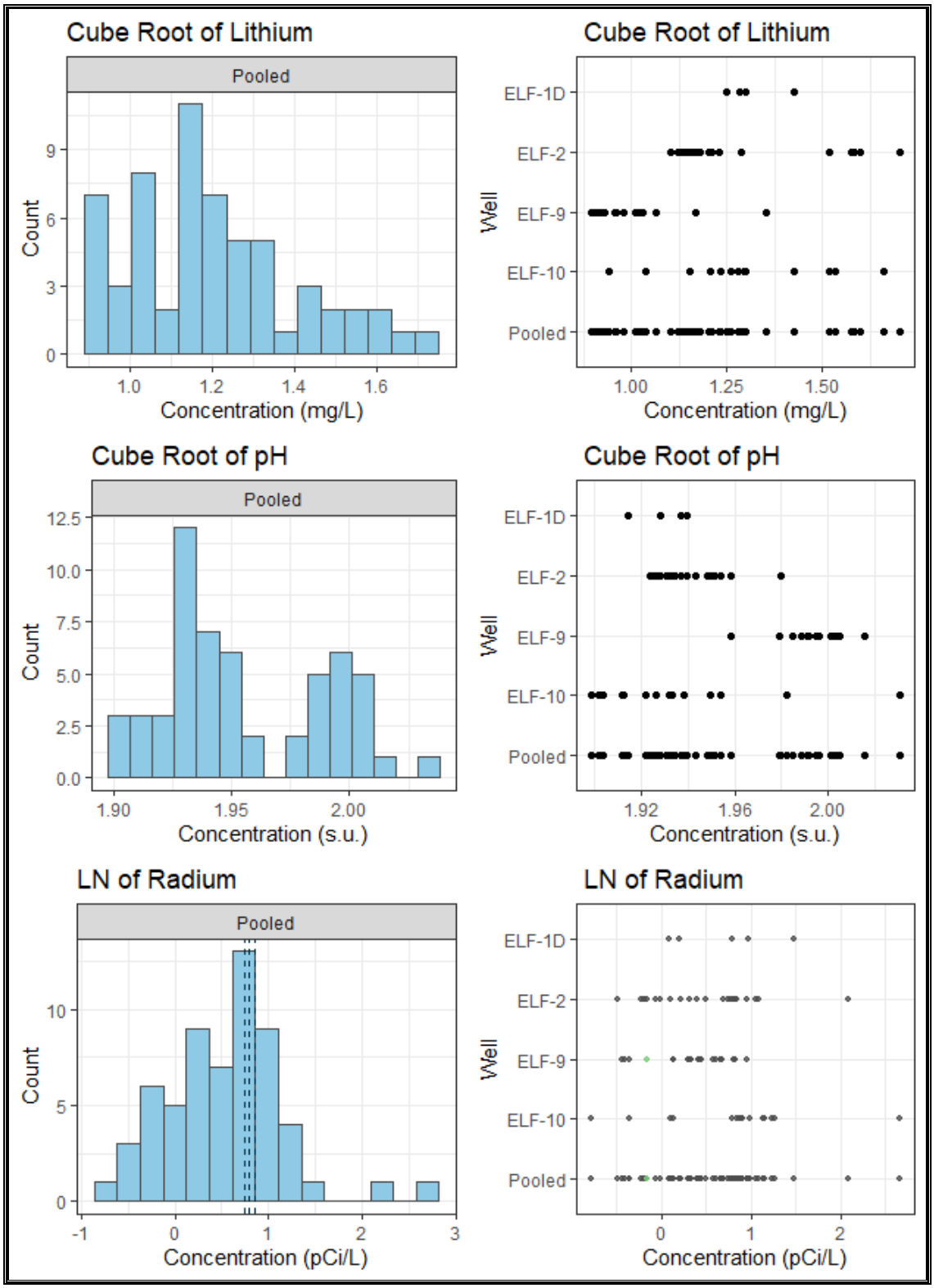

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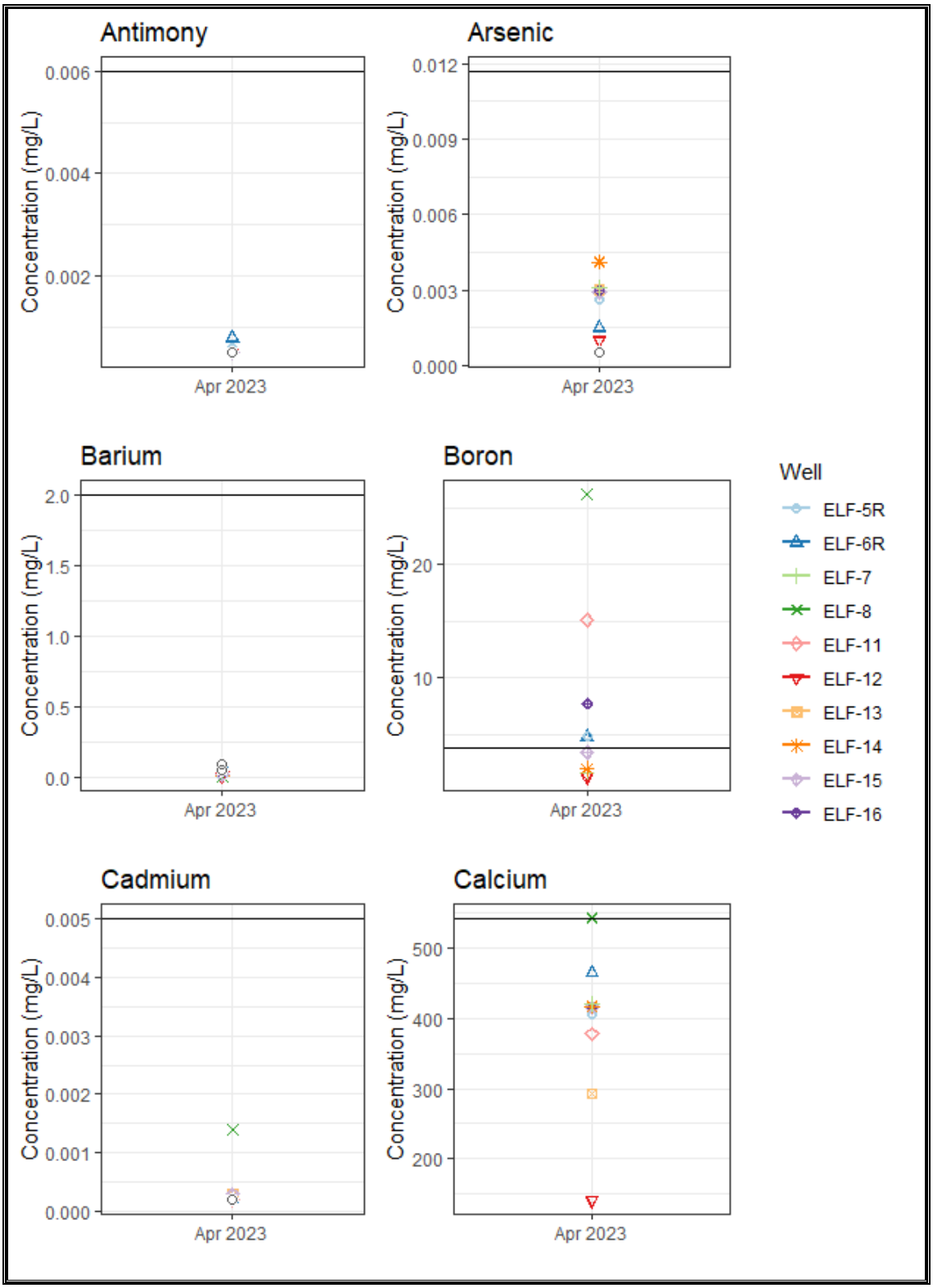


Figure C.4. Background upper tolerance limit plots for the CCR Landfill.

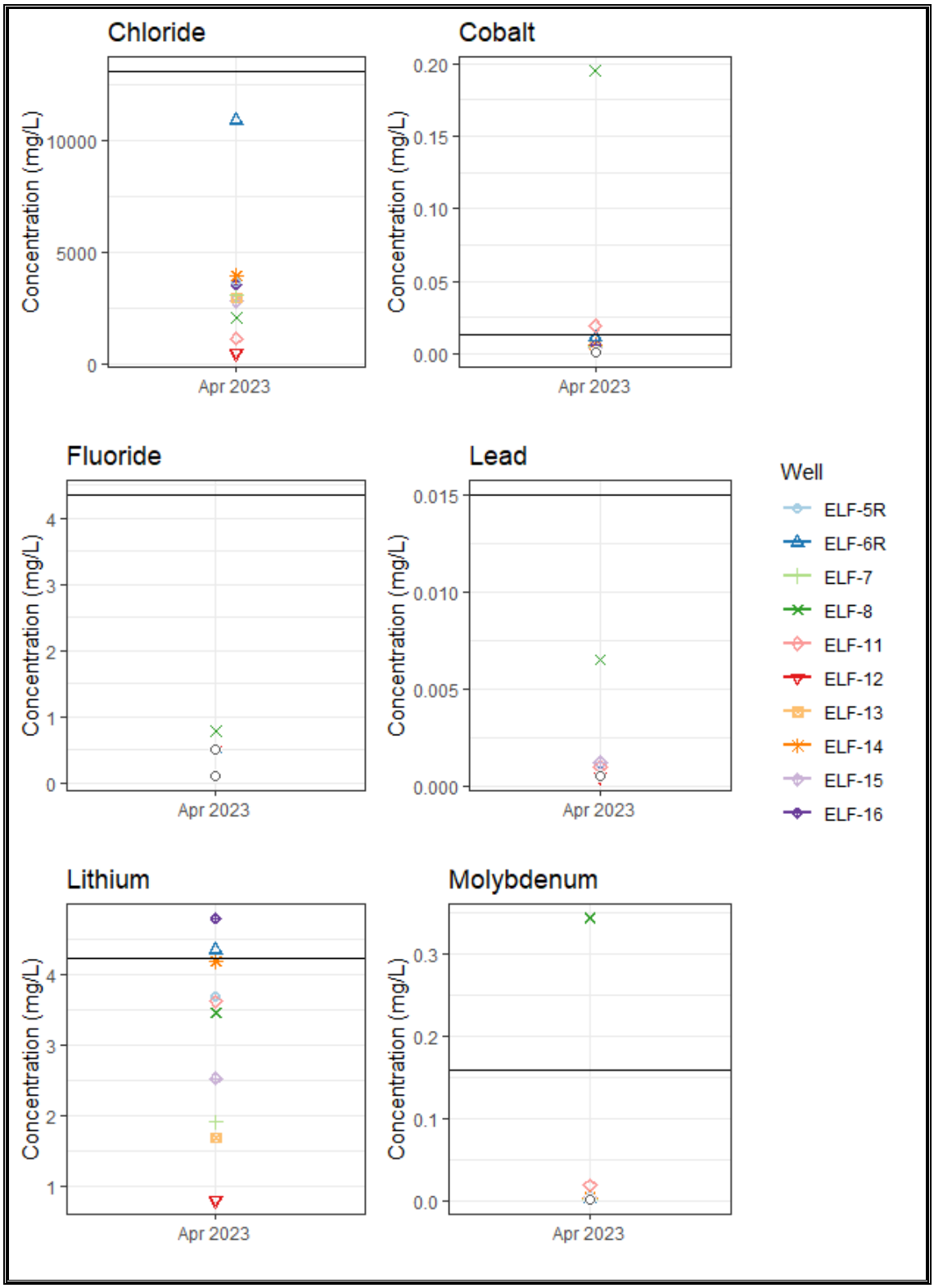
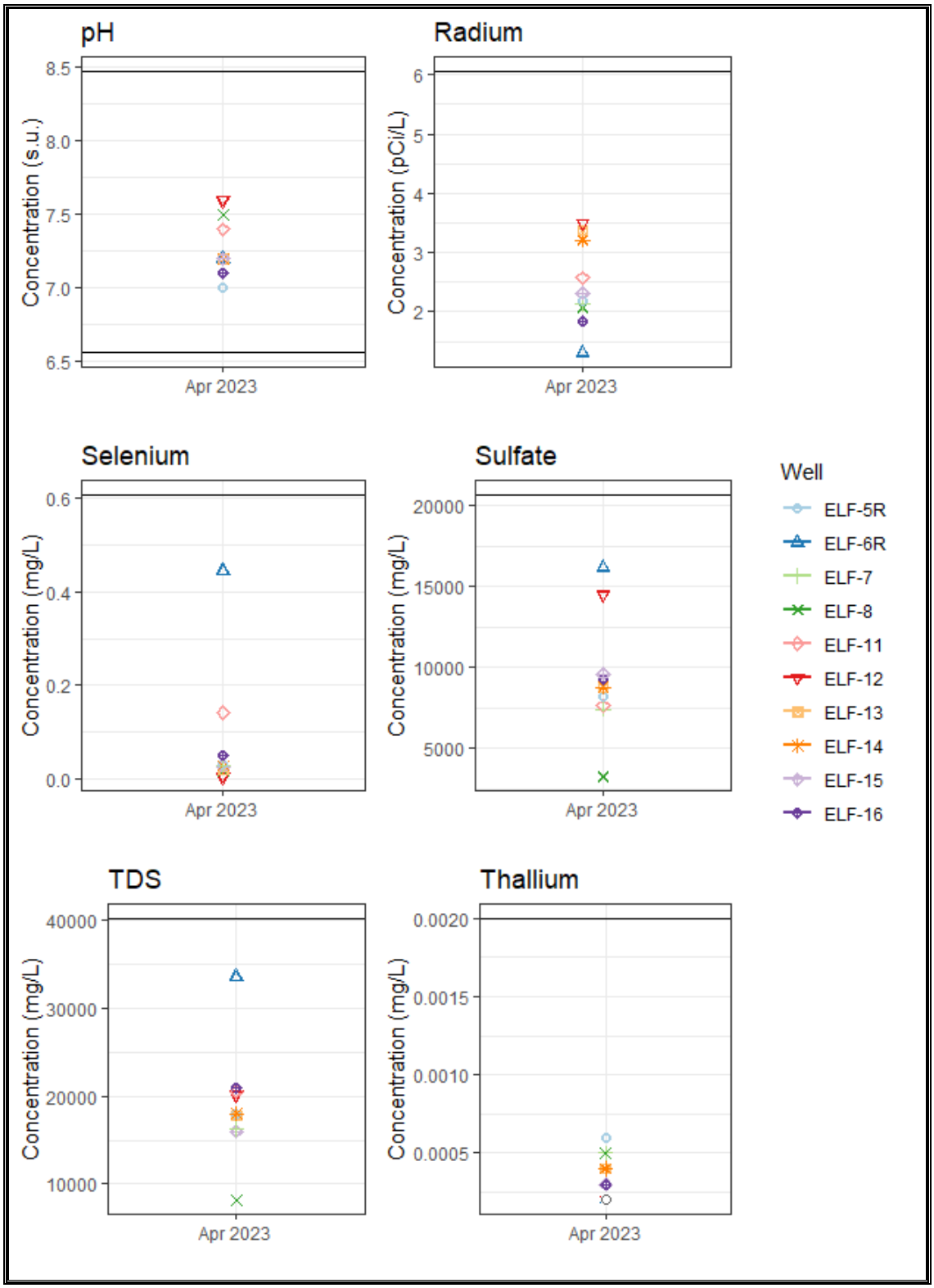


Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.



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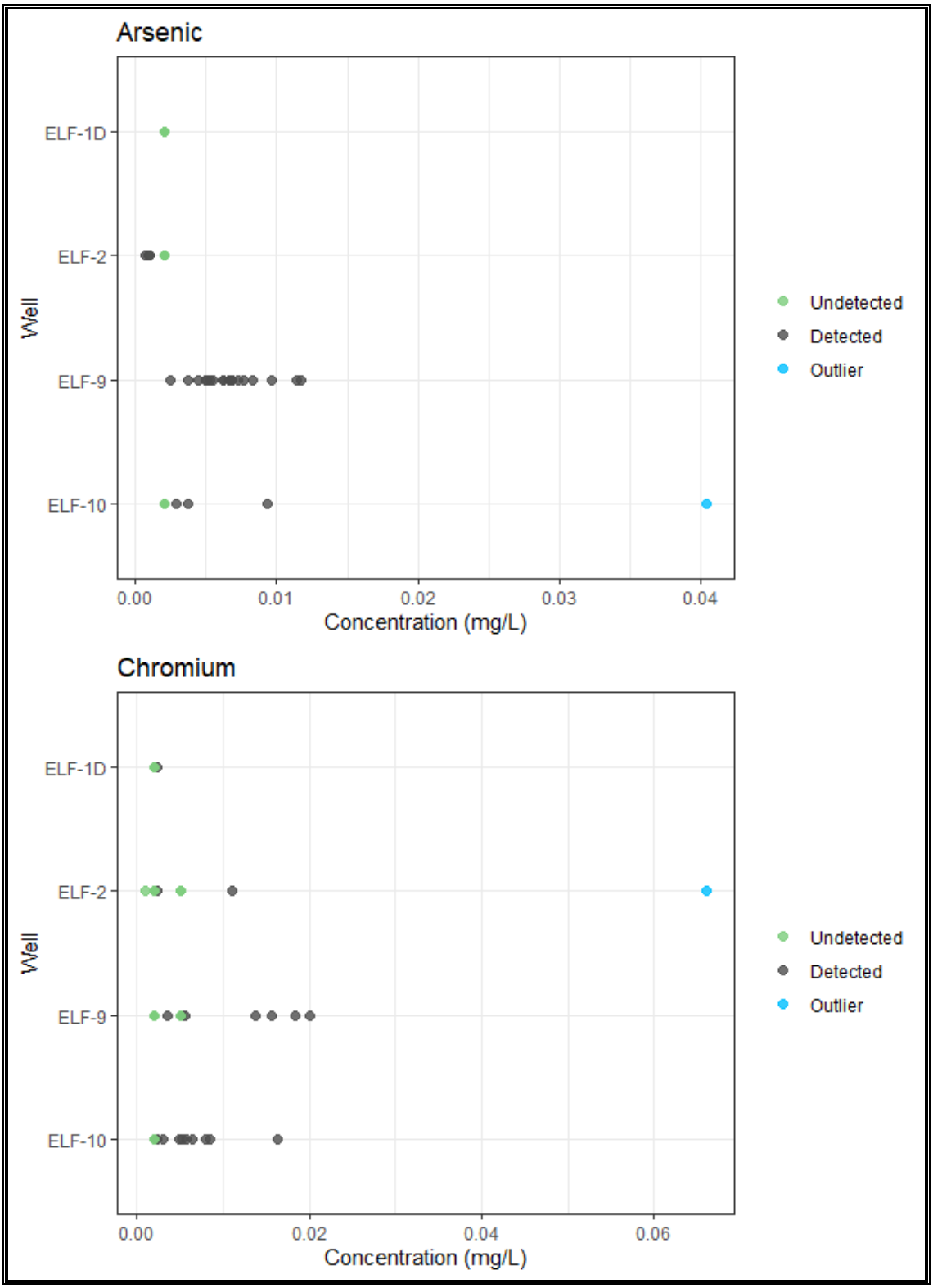

Figure C.5. Outlier plot for the Ash Landfill data.

Attachment D:

Field Data Sheets

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-1d
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	82.91
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample. We have checked recharge in the past, Very poor. 3.6 ' water. not able to collect water.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-1s
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	34.53
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample. 0.9 ft of water. very poor recharge.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-2
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	11:30
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	24.21
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,105	12.4	14,100	1.29	6.91	8	66.7
1,110	12.4	14,000	1.20	6.87	8	103
1,115	12.5	14,100	1.13	6.86	8	187
1,120	12.7	14,000	1.06	6.85	8	193
1,125	12.7	14,000	0.99	6.84	8	197

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Started to get more turbid at sampling. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-3
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	33.34
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample, 1.6' water. Very poor producer, takes > week to recharge.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-4
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	18:55
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	18.59
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,830	10.9	15,600	1.21	6.82	9	64.3
1,835	11.0	15,600	1.02	6.80	8.9	40.4
1,840	11.0	15,600	0.93	6.80	9	17.9
1,845	11.0	15,600	0.89	6.80	9	18.4
1,850	10.9	15,600	0.83	6.80	9	18

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-5R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	18:20
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	21.32
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,755	12.2	22,500	1.09	7.04	13.3	387
1,800	12.3	22,100	1.10	6.97	13.1	169
1,805	12.4	22,100	0.99	6.96	13.1	142
1,810	12.4	22,100	0.94	6.94	13.1	138
1,815	12.5	22,100	0.90	6.94	13.1	131

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-6R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	17:40
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	20.20
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,715	11.8	39,700	1.40	7.09	24.8	96.4
1,720	11.7	39,500	1.31	7.09	24.7	86.1
1,725	11.7	39,400	1.24	7.08	24.6	59.6
1,730	11.8	39,200	1.15	7.07	24.4	52.3
1,735	11.8	39,000	1.13	7.07	24.3	51.8

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-7
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	19:40
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	16.89
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,915	10.7	20,000	2.34	6.87	11.7	191
1,920	10.4	20,100	2.31	6.85	11.7	65.2
1,925	10.6	19,900	2.26	6.85	11.7	41.6
1,930	10.7	19,900	2.14	6.84	11.6	42.1
1,935	10.7	19,900	2.13	6.84	11.7	42

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-8
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	16:15
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	9.19
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,550	11.2	11,500	1.70	7.24	6.4	15.1
1,555	11.2	11,400	1.15	7.24	6.4	8.3
1,600	11.2	11,400	0.97	7.29	6.4	1.1
1,605	11.2	11,400	0.94	7.19	6.4	0
1,610	11.2	11,400	0.89	7.30	6.4	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 8 bottles - Dup included.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-9
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	09:50
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	22.85
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
915	11.1	14,900	1.33	7.63	8.3	36.8
920	11.2	14,400	1.07	7.62	8.3	29.1
925	11.2	14,100	0.99	7.64	8.1	30.6
930	11.2	14,000	0.95	7.63	7.9	0
935	11.0	13,600	0.92	7.62	7.5	0
940	11.2	12,600	1.01	7.48	7.1	0
945	11.2	12,400	1.06	7.46	6.9	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles w/sample and 4 bottles w/di water for field blank.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-10
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	50.56
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

1.44 water. From past experince, very poor recharge. No Sample.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-11
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:20
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	28.10
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,455	12.5	21,500	3.86	7.17	12.8	196
1,500	12.5	21,700	2.99	7.14	12.9	185
1,505	12.5	21,700	2.86	7.13	12.9	181
1,510	12.5	21,800	2.80	7.12	13	170
1,515	12.5	21,800	2.71	7.12	13	166

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-12
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	17:00
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	21.65
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,635	12.4	22,300	1.26	7.45	13.2	138
1,640	12.4	22,300	1.10	7.44	13.2	64
1,645	12.4	22,400	1.02	7.43	13.3	53
1,650	12.4	22,400	1.00	7.42	13.3	48.5
1,655	12.4	22,500	0.97	7.42	13.3	48.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-13
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:45
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	4.78
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,525	9.5	21,200	0.99	6.95	12.4	0.9
1,530	9.5	21,200	1.02	6.93	12.4	0
1,535	9.5	21,100	1.03	6.92	12.4	0
1,540	9.5	21,100	1.02	6.92	12.4	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-14
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	14:30
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	6.78
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,410	9.9	23,500	1.43	7.12	13.9	72.9
1,415	9.8	23,500	1.22	7.12	13.9	54.3
1,420	9.7	23,500	1.26	7.13	13.9	54.1
1,425	9.7	23,500	1.21	7.12	13.9	53.5

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles

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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-15
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:10
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	7.94
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,445	10.5	21,800	1.36	7.03	12.8	17.1
1,450	10.5	21,800	1.20	6.98	12.9	64.2
1,455	10.6	21,800	1.21	6.96	12.8	42.5
1,500	10.6	21,800	1.12	6.96	12.9	19.6
1,505	10.6	21,800	1.13	6.95	12.9	22.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-16
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	12:15
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	14.43
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,150	12.8	26,400	1.17	7.19	16	36.4
1,155	12.8	26,500	1.11	7.18	16	30.8
1,200	12.1	24,000	1.40	7.08	14.4	31
1,205	12.0	24,100	1.23	7.07	14.4	30.3
1,210	11.9	24,000	1.10	7.07	14.4	29.8

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-17
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	Dv and BG	**Depth to Water (ft.)**	29.65
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Near Dry. No sample.

Attachment E:

Laboratory Analytical Reports

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4/24/2023

Work Order: 23D0472
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

Pacificorp - Environmental Remediation
Project: Hunter Power Plant CCR
Project Manager: Brad Giles

Laboratory ID	Sample Name
23D0472-01	ELF-2
23D0472-02	ELF-4
23D0472-03	ELF-5R
23D0472-04	ELF-6R
23D0472-05	ELF-7
23D0472-06	ELF-8
23D0472-07	ELF-9
23D0472-08	ELF-11
23D0472-09	ELF-12
23D0472-10	ELF-13
23D0472-11	ELF-14
23D0472-12	ELF-15
23D0472-13	ELF-16
23D0472-14	Duplicate - (CCR)
23D0472-15	Field Blank - (CCR)

Work Order Report Narrative

Sample Preparation
All samples were prepared within method specified holding times, except as noted on the report. No preparation issues were noted.

Method Blanks
All blank values were within method acceptance criteria. No blank values exceeded the minimum reporting limit for any analysis in this work order.

Laboratory Control Samples
All laboratory control samples were within method acceptance criteria.

Method Spikes
All method spike recoveries were within method acceptance criteria, except as noted by qualifying flags.

Method Spike Duplicates
All method spike duplicates were within method acceptance criteria, except as noted by qualifying flags.

Corrective Actions
There are no corrective actions associated with this work order.

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Certificate of Analysis

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **23D0472-01**
Date Sampled: **4/6/23 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	212	mg/L	5.00	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:46	SPH
Sulfate	8440	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	11900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.029	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	4/7/23	4/10/23	
Boron, Total	3.24	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	342	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	0.066	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0131	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0021	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.56	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0041	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0033	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **23D0472-02**
Date Sampled: **4/5/23 18:55**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2350	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.1	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:47	SPH
Sulfate	6200	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	12800	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.79	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	463	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0069	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.80	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0023	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0150	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **23D0472-03**
Date Sampled: **4/5/23 18:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3650	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.0	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:51	SPH
Sulfate	8190	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	17900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0006	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0026	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.017	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.75	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	407	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0006	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	3.69	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0323	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **23D0472-04**
Date Sampled: **4/5/23 17:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	10900	mg/L	500	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:51	SPH
Sulfate	16200	mg/L	500	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	33600	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0008	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	ND	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.74	mg/L	1.00	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	465	mg/L	4.0	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0113	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0007	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.35	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0016	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.445	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **23D0472-05**
Date Sampled: **4/5/23 19:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3050	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:52	SPH
Sulfate	7420	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	16300	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0031	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.009	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.61	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	421	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0048	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.91	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0019	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0287	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **23D0472-06**
Date Sampled: **4/5/23 16:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2040	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	0.787	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.5	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:52	SPH
Sulfate	3250	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	8160	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	0.011	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	26.2	mg/L	0.05	EPA 200.7	4/12/23	4/17/23	
Cadmium, Total	0.0014	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	543	mg/L	0.2	EPA 200.7	4/12/23	4/17/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Cobalt, Total	0.195	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	0.0065	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	3.46	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.343	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	0.0175	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **23D0472-07**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	242	mg/L	5.00	EPA 300.0	4/10/23	4/10/23	
Fluoride	0.754	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.9	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:53	SPH
Sulfate	5730	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	9540	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0008	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0025	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.016	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.31	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	86.8	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.09	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0322	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0012	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **23D0472-08**
Date Sampled: **4/5/23 15:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	1120	mg/L	20.0	EPA 300.0	4/11/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:54	SPH
Sulfate	7610	mg/L	500	EPA 300.0	4/20/23	4/20/23	
Total Dissolved Solids (TDS)	20500	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.020	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	15.1	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	378	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0192	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	3.62	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0185	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.141	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **23D0472-09**
Date Sampled: **4/6/23 17:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	484	mg/L	5.00	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.6	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:54	SPH
Sulfate	14500	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	20200	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.013	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.25	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	141	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	0.808	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0046	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **23D0472-10**
Date Sampled: **4/6/23 15:45**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2950	mg/L	20.0	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.100	EPA 300.0	4/20/23	4/20/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:55	SPH
Sulfate	8750	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	17800	mg/L	100	SM 2540 C	4/20/23	4/20/23	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	ND	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	4/7/23	4/10/23	
Boron, Total	ND	mg/L	0.50	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	293	mg/L	2.0	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0043	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.69	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0009	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0188	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **23D0472-11**
Date Sampled: **4/6/23 14:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3930	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:56	SPH
Sulfate	8780	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	18000	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0041	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.93	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	417	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0062	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.19	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0034	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0275	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **23D0472-12**
Date Sampled: **4/6/23 15:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2820	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:56	SPH
Sulfate	9590	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	16000	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0029	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.024	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	3.38	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	416	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0012	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	2.53	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0025	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0256	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **23D0472-13**
Date Sampled: **4/6/23 12:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3540	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.1	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:04	SPH
Sulfate	9270	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	20900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	7.74	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	414	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0063	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.80	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0038	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0495	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**
Matrix: **Water**
Lab ID: **23D0472-14**
Date Sampled: **4/5/23 0:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2690	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Fluoride	0.811	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:05	SPH
Sulfate	3920	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	8360	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	0.0026	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	26.2	mg/L	0.05	EPA 200.7	4/13/23	4/14/23	
Cadmium, Total	0.0016	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	469	mg/L	0.2	EPA 200.7	4/13/23	4/14/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Cobalt, Total	0.197	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	0.0060	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	5.25	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.355	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	0.0174	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **23D0472-15**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	ND	mg/L	1.00	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	5.7	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:11	SPH
Sulfate	ND	mg/L	1.00	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	14	mg/L	10	SM 2540 C	4/10/23	4/10/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	ND	mg/L	0.05	EPA 200.7	4/13/23	4/14/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	ND	mg/L	0.2	EPA 200.7	4/13/23	4/14/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).
1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

APH-R = This sample was originally analyzed within the EPA-recommended holding time. The reported value was obtained from a confirmatory re-analysis that was performed outside of that holding time.
SPH = Sample submitted past method specified holding time.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0472 RADS ON 23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
	1. ELF-1D	-	-	W		4	x	x	x	x	x	x	x	x				x									
01	2. ELF-2	4/6/2023	11:30	W		4	x	x	x	x	x	x	x	x				x									
	3. ELF-3	-	-	W		4	x	x	x	x	x	x	x	x				x									
02	4. ELF-4	4/5/2023	18:55	W		4	x	x	x	x	x	x	x	x				x									
03	5. ELF-5R	4/5/2023	18:20	W		4	x	x	x	x	x	x	x	x				x									
04	6. ELF-6R	4/5/2023	17:40	W		4	x	x	x	x	x	x	x	x				x									
05	7. ELF-7	4/5/2023	19:40	W		4	x	x	x	x	x	x	x	x				x									
06	8. ELF-8	4/5/2023	16:15	W		4	x	x	x	x	x	x	x	x				x									
07	9. ELF-9	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x									
	10. ELF-10	-	-	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
	4-7-23 12:31		4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [sign	

AG AQ 1296 M 1274

Sample Receipt Conditions:
( ) Custody Seals Present
( ) Containers Intact
( ) COC and Labels Match
( ) Received on Ice
( ) Correct Containers
( ) COC Included
( ) COC Complete
( ) Sufficient Sample Volume
( ) Headspace Present (VOC)
( ) Temperature Blank
( ) Received within Hold
Checked by:

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Payment Terms

orney's

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CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0472

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/5/2023	15:20	W		4	x	x	x	x	x	x	x	x				x									
09	2. ELF-12	4/6/2023	17:00	W		4	x	x	x	x	x	x	x	x				x									
10	3. ELF-13	4/6/2023	15:45	W		4	x	x	x	x	x	x	x	x				x									
11	4. ELF-14	4/6/2023	14:30	W		4	x	x	x	x	x	x	x	x				x									
12	5. ELF-15	4/6/2023	15:10	W		4	x	x	x	x	x	x	x	x				x									
13	6. ELF-16	4/6/2023	12:15	W		4	x	x	x	x	x	x	x	x				x									
	7. ELF-17	-	-	W		4	x	x	x	x	x	x	x	x				x									
	8.																										
14	9. Duplicate - (CCR)	4/5/2023	-	W		4	x	x	x	x	x	x	x	x				x									
1415	10. Field Blank - (CCR)	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
	4-7-23 12:31		4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agress to pay collection costs and attorney's fees.

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.7									
QC Sample ID: BXD0255-BLK1	Batch: BXD0255								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0256-BLK1	Batch: BXD0256								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0462-BLK1	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0533-BLK1	Batch: BXD0533								
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
LCS - EPA 200.7									
QC Sample ID: BXD0255-BS1	Batch: BXD0255								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	99.7		85 - 115		0.199		0.200	0.005	1.00
Boron, Total	98.1		85 - 115		0.49		0.500	0.05	1.00
Calcium, Total	99.6		85 - 115		10.2		10.2	0.2	1.00
Chromium, Total	105		85 - 115		0.210		0.200	0.005	1.00
Lithium, Total	101		85 - 115		0.203		0.200	0.005	1.00
QC Sample ID: BXD0256-BS1	Batch: BXD0256								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101		85 - 115		0.202		0.200	0.005	1.00
Boron, Total	99.6		85 - 115		0.50		0.500	0.05	1.00
Calcium, Total	101		85 - 115		10.3		10.2	0.2	1.00
Chromium, Total	106		85 - 115		0.212		0.200	0.005	1.00
Lithium, Total	99.3		85 - 115		0.199		0.200	0.005	1.00
QC Sample ID: BXD0462-BS1	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	92.6		85 - 115		0.185		0.200	0.005	1.00
Boron, Total	92.6		85 - 115		0.46		0.500	0.05	1.00
Calcium, Total	95.7		85 - 115		9.8		10.2	0.2	1.00
Chromium, Total	95.7		85 - 115		0.191		0.200	0.005	1.00
Lithium, Total	96.2		85 - 115		0.192		0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 200.7 (cont.)									
QC Sample ID: BXD0462-BS2	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total			85 - 115		ND			0.005	1.00
Boron, Total			85 - 115		ND			0.05	1.00
Calcium, Total			85 - 115		0.01			0.2	1.00
Chromium, Total			85 - 115		ND			0.005	1.00
Lithium, Total			85 - 115		ND			0.005	1.00
QC Sample ID: BXD0533-BS1	Batch: BXD0533								
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	120		85 - 115		0.241		0.200	0.005	1.00
QM-11 - The Laboratory Control Sample recovery was outside acceptance limits. The analytical batch was accepted based on the recovery of the Method Spike.									
Boron, Total	106		85 - 115		0.53		0.500	0.05	1.00
Calcium, Total	119		85 - 115		12.1		10.2	0.2	1.00
QM-11 - The Laboratory Control Sample recovery was outside acceptance limits. The analytical batch was accepted based on the recovery of the Method Spike.									
Chromium, Total	100		85 - 115		0.200		0.200	0.005	1.00
Lithium, Total	101		85 - 115		0.202		0.200	0.005	1.00
Matrix Spike - EPA 200.7									
QC Sample ID: BXD0255-MS1	Batch: BXD0255		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	74.2		70 - 130		0.155	0.007	0.200	0.005	1.00
Boron, Total	110		70 - 130		1.00	0.45	0.500	0.05	1.00
Calcium, Total	103		70 - 130		303	293	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	96.6		70 - 130		0.194	0.001	0.200	0.005	1.00
Lithium, Total	163		70 - 130		2.01	1.69	0.200	0.005	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
QC Sample ID: BXD0255-MS2	Batch: BXD0255		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	99.4		70 - 130		0.342	0.143	0.200	0.005	1.00
Boron, Total	104		70 - 130		0.74	0.22	0.500	0.05	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Calcium, Total	103		70 - 130		31.1	20.5	10.2	0.2	1.00
Chromium, Total	104		70 - 130		0.209	0.001	0.200	0.005	1.00
Lithium, Total	99.9		70 - 130		0.278	0.078	0.200	0.005	1.00
QC Sample ID: BXD0256-MS1	Batch: BXD0256		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	102		70 - 130		0.278	0.073	0.200	0.050	10.00
Boron, Total	117		70 - 130		0.58	ND	0.500	0.50	10.00
Calcium, Total	129		70 - 130		77.5	64.4	10.2	2.0	10.00
Chromium, Total	108		70 - 130		0.216	ND	0.200	0.050	10.00
Lithium, Total	91.0		70 - 130		0.182	ND	0.200	0.050	10.00
QC Sample ID: BXD0256-MS2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101		70 - 130		0.230	0.029	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 200.7 (cont.)									
QC Sample ID: BXD0256-MS2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Boron, Total	92.2		70 - 130		3.70	3.24	0.500	0.05	1.00
Calcium, Total	314		70 - 130		374	342	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	113		70 - 130		0.291	0.066	0.200	0.005	1.00
Lithium, Total	107		70 - 130		1.78	1.56	0.200	0.005	1.00
QC Sample ID: BXD0462-MS1	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	97.9		70 - 130		0.220	0.024	0.200	0.005	1.00
Boron, Total	101		70 - 130		0.50	0.03	0.500	0.05	1.00
Calcium, Total	109		70 - 130		32.6	21.5	10.2	0.2	1.00
Chromium, Total	101		70 - 130		0.207	0.006	0.200	0.005	1.00
Lithium, Total	104		70 - 130		0.213	0.006	0.200	0.005	1.00
QC Sample ID: BXD0462-MS2	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	93.6		70 - 130		0.208	0.021	0.200	0.005	1.00
Boron, Total	91.8		70 - 130		1.06	0.60	0.500	0.05	1.00
Calcium, Total	95.7		70 - 130		33.4	23.7	10.2	0.2	1.00
Chromium, Total	95.8		70 - 130		0.203	0.011	0.200	0.005	1.00
Lithium, Total	99.2		70 - 130		0.442	0.244	0.200	0.005	1.00
QC Sample ID: BXD0533-MS1	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	90.5		70 - 130		0.205	0.024	0.200	0.005	1.00
Boron, Total	95.8		70 - 130		0.48	ND	0.500	0.05	1.00
Calcium, Total	83.8		70 - 130		52.6	44.1	10.2	0.2	1.00
Chromium, Total	99.8		70 - 130		0.200	0.0008	0.200	0.005	1.00
Lithium, Total	121		70 - 130		0.251	0.008	0.200	0.005	1.00
QC Sample ID: BXD0533-MS2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	104		70 - 130		0.209	ND	0.200	0.005	1.00
Boron, Total	102		70 - 130		0.51	ND	0.500	0.05	1.00
Calcium, Total	103		70 - 130		10.5	ND	10.2	0.2	1.00
Chromium, Total	93.6		70 - 130		0.187	ND	0.200	0.005	1.00
Lithium, Total	92.0		70 - 130		0.184	ND	0.200	0.005	1.00
Matrix Spike Dup - EPA 200.7									
QC Sample ID: BXD0255-MSD1	Batch: BXD0255		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	77.2	3.79	70 - 130	20	0.161	0.007	0.200	0.005	1.00
Boron, Total	115	2.51	70 - 130	20	1.02	0.45	0.500	0.05	1.00
Calcium, Total	347	7.90	70 - 130	20	328	293	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	100	3.34	70 - 130	20	0.201	0.001	0.200	0.005	1.00
Lithium, Total	190	2.60	70 - 130	20	2.07	1.69	0.200	0.005	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0255-MSD2	Batch: BXD0255		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	98.8	0.352	70 - 130	20	0.340	0.143	0.200	0.005	1.00
Boron, Total	102	0.811	70 - 130	20	0.74	0.22	0.500	0.05	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Calcium, Total	103	0.277	70 - 130	20	31.0	20.5	10.2	0.2	1.00
Chromium, Total	103	0.770	70 - 130	20	0.207	0.001	0.200	0.005	1.00
Lithium, Total	100	0.359	70 - 130	20	0.279	0.078	0.200	0.005	1.00
QC Sample ID: BXD0256-MSD1	Batch: BXD0256		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	98.9	2.55	70 - 130	20	0.271	0.073	0.200	0.050	10.00
Boron, Total	112	4.20	70 - 130	20	0.56	ND	0.500	0.50	10.00
Calcium, Total	109	2.56	70 - 130	20	75.6	64.4	10.2	2.0	10.00
Chromium, Total	106	2.34	70 - 130	20	0.211	ND	0.200	0.050	10.00
Lithium, Total	87.5	3.92	70 - 130	20	0.175	ND	0.200	0.050	10.00
QC Sample ID: BXD0256-MSD2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101	0.390	70 - 130	20	0.231	0.029	0.200	0.005	1.00
Boron, Total	110	2.35	70 - 130	20	3.79	3.24	0.500	0.05	1.00
Calcium, Total	359	1.23	70 - 130	20	379	342	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	116	2.28	70 - 130	20	0.298	0.066	0.200	0.005	1.00
Lithium, Total	118	1.19	70 - 130	20	1.80	1.56	0.200	0.005	1.00
QC Sample ID: BXD0462-MSD1	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	94.8	2.87	70 - 130	20	0.213	0.024	0.200	0.005	1.00
Boron, Total	99.2	1.56	70 - 130	20	0.50	0.03	0.500	0.05	1.00
Calcium, Total	98.3	3.37	70 - 130	20	31.5	21.5	10.2	0.2	1.00
Chromium, Total	97.8	2.74	70 - 130	20	0.202	0.006	0.200	0.005	1.00
Lithium, Total	99.4	3.88	70 - 130	20	0.205	0.006	0.200	0.005	1.00
QC Sample ID: BXD0462-MSD2	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	95.5	1.86	70 - 130	20	0.212	0.021	0.200	0.005	1.00
Boron, Total	94.9	1.47	70 - 130	20	1.08	0.60	0.500	0.05	1.00
Calcium, Total	101	1.63	70 - 130	20	34.0	23.7	10.2	0.2	1.00
Chromium, Total	98.4	2.58	70 - 130	20	0.208	0.011	0.200	0.005	1.00
Lithium, Total	103	1.55	70 - 130	20	0.449	0.244	0.200	0.005	1.00
QC Sample ID: BXD0533-MSD1	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	96.0	5.23	70 - 130	20	0.216	0.024	0.200	0.005	1.00
Boron, Total	101	5.17	70 - 130	20	0.50	ND	0.500	0.05	1.00
Calcium, Total	95.6	2.26	70 - 130	20	53.8	44.1	10.2	0.2	1.00
Chromium, Total	98.1	1.66	70 - 130	20	0.197	0.0008	0.200	0.005	1.00
Lithium, Total	119	1.89	70 - 130	20	0.246	0.008	0.200	0.005	1.00
QC Sample ID: BXD0533-MSD2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	88.6	16.4	70 - 130	20	0.177	ND	0.200	0.005	1.00

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0533-MSD2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Boron, Total	87.6	14.9	70 - 130	20	0.44	ND	0.500	0.05	1.00
Calcium, Total	87.8	16.0	70 - 130	20	9.0	ND	10.2	0.2	1.00
Chromium, Total	94.6	1.06	70 - 130	20	0.189	ND	0.200	0.005	1.00
Lithium, Total	93.0	1.08	70 - 130	20	0.186	ND	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.8									
QC Sample ID: BXD0258-BLK1	Batch: BXD0258								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total					ND			0.0005	1.00
Arsenic, Total					ND			0.0005	1.00
Beryllium, Total					ND			0.0005	1.00
Cadmium, Total					ND			0.0002	1.00
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BXD0282-BLK1	Batch: BXD0282								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total					ND			0.0005	1.00
Arsenic, Total					ND			0.0005	1.00
Beryllium, Total					ND			0.0005	1.00
Cadmium, Total					ND			0.0002	1.00
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
LCS - EPA 200.8									
QC Sample ID: BXD0258-BS1	Batch: BXD0258								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	105		85 - 115		0.042		0.0400	0.0005	1.00
Arsenic, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	104		85 - 115		0.042		0.0400	0.0005	1.00
Cadmium, Total	103		85 - 115		0.041		0.0400	0.0002	1.00
Cobalt, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Lead, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Molybdenum, Total	102		85 - 115		0.041		0.0400	0.0005	1.00
Selenium, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.042		0.0400	0.0002	1.00
QC Sample ID: BXD0282-BS1	Batch: BXD0282								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	99.4		85 - 115		0.040		0.0400	0.0005	1.00
Arsenic, Total	99.1		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Cadmium, Total	96.6		85 - 115		0.039		0.0400	0.0002	1.00
Cobalt, Total	96.8		85 - 115		0.039		0.0400	0.0005	1.00
Lead, Total	96.3		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	98.8		85 - 115		0.040		0.0400	0.0005	1.00
Selenium, Total	98.3		85 - 115		0.039		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.042		0.0400	0.0002	1.00
Matrix Spike - EPA 200.8									
QC Sample ID: BXD0258-MS1	Batch: BXD0258		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	94.5		70 - 130		0.038	0.0003	0.0400	0.0005	1.00
Arsenic, Total	92.2		70 - 130		0.038	0.001	0.0400	0.0005	1.00
Beryllium, Total	96.3		70 - 130		0.039	ND	0.0400	0.0050	10.00

Matrix Spike - EPA 200.8 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0258-MS1	Batch: BXD0258		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Cadmium, Total	99.0		70 - 130		0.040	0.0002	0.0400	0.0002	1.00
Cobalt, Total	97.6		70 - 130		0.052	0.013	0.0400	0.0005	1.00
Lead, Total	94.6		70 - 130		0.040	0.002	0.0400	0.0005	1.00
Molybdenum, Total	106		70 - 130		0.047	0.004	0.0400	0.0005	1.00
Selenium, Total	94.1		70 - 130		0.041	0.003	0.0400	0.0005	1.00
Thallium, Total	97.9		70 - 130		0.039	0.0002	0.0400	0.0002	1.00
QC Sample ID: BXD0258-MS2	Batch: BXD0258		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	106		70 - 130		0.043	0.0004	0.0400	0.0005	1.00
Arsenic, Total	93.6		70 - 130		0.040	0.003	0.0400	0.0005	1.00
Beryllium, Total	91.8		70 - 130		0.037	ND	0.0400	0.0050	10.00
Cadmium, Total	96.4		70 - 130		0.039	0.0003	0.0400	0.0002	1.00
Cobalt, Total	95.5		70 - 130		0.042	0.004	0.0400	0.0005	1.00
Lead, Total	94.8		70 - 130		0.038	0.0001	0.0400	0.0005	1.00
Molybdenum, Total	104		70 - 130		0.043	0.0009	0.0400	0.0005	1.00
Selenium, Total	94.3		70 - 130		0.056	0.019	0.0400	0.0005	1.00
Thallium, Total	98.5		70 - 130		0.040	0.0004	0.0400	0.0002	1.00
QC Sample ID: BXD0282-MS1	Batch: BXD0282		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	104		70 - 130		0.042	0.0001	0.0400	0.0005	1.00
Arsenic, Total	105		70 - 130		0.043	0.0006	0.0400	0.0005	1.00
Beryllium, Total	105		70 - 130		0.042	ND	0.0400	0.0005	1.00
Cadmium, Total	99.0		70 - 130		0.040	ND	0.0400	0.0002	1.00
Cobalt, Total	96.2		70 - 130		0.039	0.0002	0.0400	0.0005	1.00
Lead, Total	94.8		70 - 130		0.038	0.0001	0.0400	0.0005	1.00
Molybdenum, Total	105		70 - 130		0.043	0.001	0.0400	0.0005	1.00
Selenium, Total	108		70 - 130		0.045	0.001	0.0400	0.0005	1.00
Thallium, Total	103		70 - 130		0.041	ND	0.0400	0.0002	1.00
QC Sample ID: BXD0282-MS2	Batch: BXD0282		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	99.9		70 - 130		0.047	0.007	0.0400	0.0005	1.00
Arsenic, Total	99.4		70 - 130		0.067	0.027	0.0400	0.0005	1.00
Beryllium, Total	102		70 - 130		0.041	ND	0.0400	0.0005	1.00
Cadmium, Total	95.1		70 - 130		0.039	0.001	0.0400	0.0002	1.00
Cobalt, Total	94.2		70 - 130		0.038	0.0004	0.0400	0.0005	1.00
Lead, Total	92.6		70 - 130		0.040	0.002	0.0400	0.0005	1.00
Molybdenum, Total	101		70 - 130		0.044	0.003	0.0400	0.0005	1.00
Selenium, Total	101		70 - 130		0.042	0.002	0.0400	0.0005	1.00
Thallium, Total	101		70 - 130		0.042	0.002	0.0400	0.0002	1.00

QC Report for Work Order (WO) - 23D0472

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 245.1									
QC Sample ID: BXD0353-BLK1	Batch: BXD0353								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total					ND			0.00015	1.00
LCS - EPA 245.1									
QC Sample ID: BXD0353-BS1	Batch: BXD0353								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	105		85 - 115		0.00526		0.00500	0.00015	1.00
Matrix Spike - EPA 245.1									
QC Sample ID: BXD0353-MS1	Batch: BXD0353		QC Source Sample: 23D0472-01						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	104		75 - 125		0.00521	ND	0.00500	0.00015	1.00
Matrix Spike Dup - EPA 245.1									
QC Sample ID: BXD0353-MSD1	Batch: BXD0353		QC Source Sample: 23D0472-01						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	100	3.71	75 - 125	20	0.00502	ND	0.00500	0.00015	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 300.0									
QC Sample ID: BXD0289-BLK1	Batch: BXD0289								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BXD0313-BLK1	Batch: BXD0313								
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BXD0346-BLK1	Batch: BXD0346								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride					ND			1.00	1.00
QC Sample ID: BXD0969-BLK1	Batch: BXD0969								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
LCS - EPA 300.0									
QC Sample ID: BXD0289-BS1	Batch: BXD0289								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	96.9		90 - 110		48.4		50.0	1.00	1.00
Fluoride	96.3		90 - 110		4.82		5.00	0.100	1.00
Sulfate	95.9		90 - 110		48.0		50.0	1.00	1.00
QC Sample ID: BXD0313-BS1	Batch: BXD0313								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	96.7		90 - 110		48.3		50.0	1.00	1.00
Fluoride	98.8		90 - 110		4.94		5.00	0.100	1.00
Sulfate	97.0		90 - 110		48.5		50.0	1.00	1.00
QC Sample ID: BXD0346-BS1	Batch: BXD0346								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	98.2		90 - 110		49.1		50.0	1.00	1.00
QC Sample ID: BXD0969-BS1	Batch: BXD0969								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	102		90 - 110		5.08		5.00	0.100	1.00
Sulfate	101		90 - 110		50.6		50.0	1.00	1.00
Matrix Spike - EPA 300.0									
QC Sample ID: BXD0289-MS1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	93.4		80 - 120		1150	212	1000	110	1.00
Fluoride	96.9		80 - 120		96.9	ND	100	11.0	1.00
Sulfate	50.3		80 - 120		8940	8440	1000	110	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0289-MS2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.3		80 - 120		126	33.9	100	11.0	1.00
Fluoride	97.4		80 - 120		9.74	ND	10.0	1.10	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 300.0 (cont.)									
QC Sample ID: BXD0289-MS2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Sulfate	88.2		80 - 120		146	57.8	100	11.0	1.00
QC Sample ID: BXD0313-MS1	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	186		80 - 120		18000	16200	1000	110	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Fluoride	83.6		80 - 120		83.6	ND	100	11.0	1.00
Sulfate	104		80 - 120		3180	2130	1000	110	1.00
QC Sample ID: BXD0313-MS2	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	76.4		80 - 120		834	453	500	55.0	1.00
QM-010 - The MS recovery was outside acceptance limits but passed Duplicate Spike acceptance limits. The batch was accepted based on the acceptability of the MSD as the batch Spike.									
Fluoride	100		80 - 120		50.1	ND	50.0	5.50	1.00
Sulfate	7.36		80 - 120		4750	4710	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MS1	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	89.6		80 - 120		1350	453	1000	110	1.00
QC Sample ID: BXD0346-MS2	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	88.9		80 - 120		27900	19000	10000	1100	1.00
QC Sample ID: BXD0346-MS3	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	12.7		80 - 120		21100	21000	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MS4	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	-162		80 - 120		16700	17600	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0969-MS1	Batch: BXD0969		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	97.3		80 - 120		1.05	0.076	1.00	0.110	1.00
Sulfate	113		80 - 120		104	93.0	10.0	1.10	1.00
Matrix Spike Dup - EPA 300.0									
QC Sample ID: BXD0289-MSD1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.3	0.912	80 - 120	20	1140	212	1000	110	1.00
Fluoride	95.8	1.16	80 - 120	20	95.8	ND	100	11.0	1.00
Sulfate	44.6	0.644	80 - 120	20	8880	8440	1000	110	1.00

Matrix Spike Dup - EPA 300.0 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0289-MSD1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0289-MSD2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.4	0.113	80 - 120	20	126	33.9	100	11.0	1.00
Fluoride	99.3	1.99	80 - 120	20	9.93	ND	10.0	1.10	1.00
Sulfate	88.7	0.312	80 - 120	20	146	57.8	100	11.0	1.00
QC Sample ID: BXD0313-MSD1	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	209	1.30	80 - 120	20	18200	16200	1000	110	1.00
Fluoride	93.7		80 - 120	20	93.7	ND	100	11.0	1.00
Sulfate	104	0.111	80 - 120	20	3170	2130	1000	110	1.00
QC Sample ID: BXD0313-MSD2	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	85.0	5.04	80 - 120	20	878	453	500	55.0	1.00
Fluoride	98.5	1.73	80 - 120	20	49.2	ND	50.0	5.50	1.00
Sulfate	117	10.9	80 - 120	20	5290	4710	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MSD1	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	90.0	0.277	80 - 120	20	1350	453	1000	110	1.00
QC Sample ID: BXD0346-MSD2	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	82.7	2.28	80 - 120	20	27200	19000	10000	1100	1.00
QC Sample ID: BXD0346-MSD3	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	16.9	0.101	80 - 120	20	21100	21000	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MSD4	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	-161	0.0333	80 - 120	20	16800	17600	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0969-MSD1	Batch: BXD0969		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	99.9	2.41	80 - 120	20	1.07	0.076	1.00	0.110	1.00
Sulfate	114	0.0942	80 - 120	20	104	93.0	10.0	1.10	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2540 C									
QC Sample ID: BXD0259-BLK1	Batch: BXD0259								
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BXD0292-BLK1	Batch: BXD0292								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BXD0850-BLK1	Batch: BXD0850								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
Duplicate - SM 2540 C									
QC Sample ID: BXD0259-DUP1	Batch: BXD0259	QC Source Sample: 23D0472-01							
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	6			10	11200	11900		100	1.00
QC Sample ID: BXD0259-DUP2	Batch: BXD0259	QC Source Sample: 23D0472-02							
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	2			10	12500	12800		100	1.00
QC Sample ID: BXD0292-DUP1	Batch: BXD0292	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	0.7			10	1710	1720		20	1.00
QC Sample ID: BXD0292-DUP2	Batch: BXD0292	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	3			10	900	876		20	1.00
QC Sample ID: BXD0850-DUP1	Batch: BXD0850	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	2			10	1170	1190		20	1.00
QC Sample ID: BXD0850-DUP2	Batch: BXD0850	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	0.5			10	880	876		20	1.00
LCS - SM 2540 C									
QC Sample ID: BXD0259-BS1	Batch: BXD0259								
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	101		90 - 110		404		400	20	1.00
QC Sample ID: BXD0292-BS1	Batch: BXD0292								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	105		90 - 110		420		400	20	1.00
QC Sample ID: BXD0850-BS1	Batch: BXD0850								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	95		90 - 110		380		400	20	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Duplicate - SM 4500 H-B									
QC Sample ID: BXD0241-DUP1	Batch: BXD0241		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
pH		0.675		3	7.4	7.4		0.1	1.00
SPH - Sample submitted past method specified holding time.									
QC Sample ID: BXD0242-DUP1	Batch: BXD0242		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
pH		0.685		3	7.3	7.3		0.1	1.00
SPH - Sample submitted past method specified holding time.									

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LABORATORIES

5/18/2023

Work Order: 23D0470
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **23D0470-01**
Date Sampled: **4/6/23 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.58	pCi/L	0.26	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.26	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.27	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.7	pCi/L	0.40	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.40	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **23D0470-02**
Date Sampled: **4/5/23 18:55**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.49	pCi/L	0.17	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.17	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.24	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.34	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.34	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.21	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **23D0470-03**
Date Sampled: **4/5/23 18:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.84	pCi/L	0.30	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.30	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.33	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.50	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.50	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.28	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **23D0470-04**
Date Sampled: **4/5/23 17:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.27	pCi/L	0.22	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.22	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.20	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.0	pCi/L	0.36	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.36	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.21	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **23D0470-05**
Date Sampled: **4/5/23 19:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.74	pCi/L	0.24	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.24	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.30	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.41	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.41	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **23D0470-06**
Date Sampled: **4/5/23 16:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.1	pCi/L	0.18	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.18	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.35	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	0.99	pCi/L	0.48	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.48	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **23D0470-07**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.55	pCi/L	0.31	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.31	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.45	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.45	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **23D0470-08**
Date Sampled: **4/5/23 15:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.64	pCi/L	0.22	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.22	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.28	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.9	pCi/L	0.42	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.42	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.25	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **23D0470-09**
Date Sampled: **4/6/23 17:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.94	pCi/L	0.28	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.28	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.35	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.6	pCi/L	0.39	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.39	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.25	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **23D0470-10**
Date Sampled: **4/6/23 15:45**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.90	pCi/L	0.18	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.18	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.32	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.5	pCi/L	0.55	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.55	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.33	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **23D0470-11**
Date Sampled: **4/6/23 14:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.86	pCi/L	0.29	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.33	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.4	pCi/L	0.44	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.44	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.27	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **23D0470-12**
Date Sampled: **4/6/23 15:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.93	pCi/L	0.21	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.21	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.32	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.38	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.38	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.22	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **23D0470-13**
Date Sampled: **4/6/23 12:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.2	pCi/L	0.26	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.26	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.37	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	0.66	pCi/L	0.52	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.52	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.28	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**

Matrix: **Water**
Lab ID: **23D0470-14**

Date Sampled: **4/5/23 0:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.1	pCi/L	0.17	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.17	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.34	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.0	pCi/L	0.44	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.44	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **23D0470-15**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.29	pCi/L	0.29	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.23	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.0	pCi/L	0.41	EPA 904.0	5/9/23	5/13/23	SL-62
Radium-228 LLD	0.41	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).
1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

SL-62 = Analysis performed by Pace Analytical National, Mount Juliet, TN 37122

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
	1. ELF-1D	-	-	W		4	x	x	x	x	x	x	x	x				x								
01	2. ELF-2	4/6/2023	11:30	W		4	x	x	x	x	x	x	x	x				x								
	3. ELF-3	-	-	W		4	x	x	x	x	x	x	x	x				x								
02	4. ELF-4	4/5/2023	18:55	W		4	x	x	x	x	x	x	x	x				x								
03	5. ELF-5R	4/5/2023	18:20	W		4	x	x	x	x	x	x	x	x				x								
04	6. ELF-6R	4/5/2023	17:40	W		4	x	x	x	x	x	x	x	x				x								
05	7. ELF-7	4/5/2023	19:40	W		4	x	x	x	x	x	x	x	x				x								
06	8. ELF-8	4/5/2023	16:15	W		4	x	x	x	x	x	x	x	x				x								
07	9. ELF-9	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x								
	10. ELF-10	-	-	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time 4-7-23 12:31	Received by: [signature]	Date/Time 4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [sign	

AG(2)1298 AQ1296 M127

Sample Receipt Conditions:

( ) Custody Seals Present	(✓) Correct Containers	( ) Headspace Present (VOC)
(✓) Containers Intact	(✓) COC Included	( ) Temperature Blank
(✓) COC and Labels Match	(✓) COC Complete	(✓) Received within Hold
(✓) Received on Ice	(✓) Sufficient Sample Volume	Checked by:

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Payment Terms

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
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PHONE #: (435) 748-6576 FAX:
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BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																	Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/5/2023	15:20	W		4	x	x	x	x	x	x	x	x				x								
09	2. ELF-12	4/6/2023	17:00	W		4	x	x	x	x	x	x	x	x				x								
10	3. ELF-13	4/6/2023	15:45	W		4	x	x	x	x	x	x	x	x				x								
11	4. ELF-14	4/6/2023	14:30	W		4	x	x	x	x	x	x	x	x				x								
12	5. ELF-15	4/6/2023	15:10	W		4	x	x	x	x	x	x	x	x				x								
13	6. ELF-16	4/6/2023	12:15	W		4	x	x	x	x	x	x	x	x				x								
	7. ELF-17	-	-	W		4	x	x	x	x	x	x	x	x				x								
	8.																									
14	9. Duplicate - (CCR)	4/5/2023	-	W		4	x	x	x	x	x	x	x	x				x								
15	10. Field Blank - (CCR)	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek | Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time 4-7-23 12:31	Received by: [signature]	Date/Time 4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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ATTACHMENT B:

Field Summary Report – October 2023 Event

Water & Environmental TECHNOLOGIES

Field Summary Report

Facility Name:	Hunter Power Plant – CCR Landfill
Event Description:	Assessment Monitoring
Event Dates:	October 23**,** 2023
Field Personnel:	Brad Giles, Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite October 23, 2023 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

- ELF-10
- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-1D
- ELF-2
- ELF-3
- ELF-4
- ELF-5R
- ELF-6R
- ELF-7
- ELF-8
- ELF-9
- ELF-15
- ELF-16
- ELF-17

The following details dates for conducting field work and post-field work data processing:

- Date fieldwork completed: 10/23/2023
- Dates unvalidated lab data received: 11/9/2023 & 12/15/2023
- Data validation completion date: 12/19/2023

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to Chemtech-Ford in Sandy, Utah. Samples arrived at Chemtech-Ford on 10/26/2023. Chemtech-Ford subcontracted Radium analyses to Pace Analytical in Mount Juliet, Tennessee. The following information is attached to this summary as a supplement:

- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

SAP DEVIATIONS. Wells ELF-3, ELF-10, ELF-17 and ELF-1D did not have enough water to sample.

Attachment A:

Groundwater Contour Map

ELF-1D = Well ID
5,586.64 = Water Level Elevation (ft.)
CCR Well
CCR Well - for Water Quality Only
Groundwater Elevation Conour (Contour Interval = 5 ft.)
Inferred Groundwater Elevation Conour (Contour Interval = 5 ft.)

N
W E
S

NO.	DESCRIPTION	DATE	DRAFT	REVIEW
1	MAP CREATION	7/21/23	JH	RH & EE
2	CONTOUR EDITS., LEF-17, ELF-9	9/29/23	KK	EE
3				
4				
5				

NOTES

ELF-17
5,555.35

ELF-16
5,555.37

ELF-14
5,554.13

ELF-11
5,569.22

ELF-6R
5,559.79

ELF-8
5,575.31

ELF-2
5,587.81

ELF-13
5,554.65

ELF-15
5,555.87

ELF-5R
5,557.47

ELF-12
5,548.34

ELF-7
5,562.92

ELF-4
5,562.91

ELF-1D
5,586.64

ELF-3
5,571.44

ELF-9
5,638.15

ELF-10
5,570.01

5570
5580
5585
5565
5560
5555
5550
5575

Feet
0 500 1,000 2,000

Measurement Date: 4/5/23 - 4/6/23
Imagery Date: 2021

GROUNDWATER ELEVATION MAP - CCR LANDFILL

HUNTER POWER PLANT

Attachment A

JOB#: PERCM052
DATE:9/29/2023

Path: M:\PERC\PERC_CCR\GIS\2023_CCR_Sampling\Hunter\2023_CCR_Sampling\2023_CCR_Sampling.aprx, Author: kkresan

PACIFICORP

Water & Environmental TECHNOLOGIES

Attachment B:

Data Validation Summary

Data Verification/Validation Checklist and Summary Report

PROJECT AND LABORATORY INFORMATION	
Project/Task/Sub-Task #:	PAC-HTRCCR-M052
Site & Location:	Hunter Power Plant – Castle Dale, UT
Sample Collection Date(s):	April 5-7, 2023
Laboratory & Location:	Chemtech-Ford Laboratories – Sandy, UT Pace Analytical – Mount Juliet, TN
Sample Delivery Group (SDG):	2023 Spring
Work Order (WO):	23D0472
Extraction/Prep Date(s):	NA
Analysis Date(s):	April 7 – May 13, 2023
Laboratory Report Date(s):	April 24, 2023 (Chemtech-Ford) May 17, 2023 (Pace Analytical)
Data Validator:	Richelle Carney
Data Validation Date(s):	August 8, 2023
Data Validation Reviewer:	Janelle Garza
Data Validation Review Date(s):	September 1, 2023

SDG/WO					
Sample ID	**Lab ID**	**Sample Date**	**Sample Time**	**Matrix**	**Notes**
ELF-2	23D0472-01/12D0470-01	4/6/2023	11:30	Aqueous	
ELF-4	23D0472-02/12D0470-02	4/5/2023	18:55	Aqueous	
ELF-5R	23D0472-03/12D0470-03	4/5/2023	18:20	Aqueous	
ELF-6R	23D0472-04/12D0470-04	4/5/2023	17:40	Aqueous	
ELF-7	23D0472-05/12D0470-05	4/5/2023	19:40	Aqueous	
ELF-8	23D0472-06/12D0470-06	4/5/2023	16:15	Aqueous	
ELF-9	23D0472-07/12D0470-07	4/6/2023	9:50	Aqueous	
ELF-11	23D0472-08/12D0470-08	4/5/2023	15:20	Aqueous	
ELF-12	23D0472-09/12D0470-09	4/6/2023	17:00	Aqueous	
ELF-13	23D0472-10/12D0470-10	4/6/2023	15:45	Aqueous	
ELF-14	23D0472-11/12D0470-11	4/6/2023	14:30	Aqueous	
ELF-15	23D0472-12/12D0470-12	4/6/2023	15:10	Aqueous	
ELF-16	23D0472-13/12D0470-13	4/6/2023	12:15	Aqueous	
Duplicate - (CCR)	23D0472-14/12D0470-14	4/5/2023	12:00	Aqueous	ELF-8 Duplicate
Field Blank - (CCR)	23D0472-15/12D0470-15	4/6/2023	9:50	Deionized Water	Field Blank

METHOD(S)/ANALYSES	
A2540 C	Total Dissolved Solids (TDS)
A4500-H B	pH
E200.7/8: Total Metals	Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Lead, Lithium, Molybdenum, Selenium, Thallium
E245.1	Mercury
E300.0	Chloride & Sulfate & Fluoride
E903.0/9315	Radium-226
904/9320	Radium-228

QUALIFIER DEFINITIONS	
U	The analyte was analyzed for but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J-	The result is an estimated quantity, but the result may be biased low.
J+	The result is an estimated quantity, but the result may be biased high.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

GUIDANCE DOCUMENTS			
List any/all Environmental Protection Agency (EPA) or state Department of Environmental Quality (DEQ) guidance documents referenced/resourced.			**N/A**
List any/all project quality assurance plan (QAP), sampling and analysis plan (SAP), or work plan (WP) referenced/resourced.			**N/A**
Sampling and Analysis Plan: Groundwater Monitoring: Hunter Power Plant : Castle Dale, Utah (July 2018)			
List any/all data validation (DV) standard operating guideline (SOG) or procedure (SOP) referenced/resourced.			**N/A**
Water & Environmental Technologies (WET) | Data Validation (DV): Standard Operating Guidelines (SOG) | Inorganic, Organic, Radioanalytical, & High Resolution			
Select the applicable United States Environmental Protection Agency (USEPA) National Functional Guidelines (NFGs) Superfund Methods Data Review (SMDR) referenced/resourced:	**Inorganic**	**Organic**	**N/A**
	X		
Select the applicable USEPA Guideline for Data Review referenced/resourced:	**High Resolution**	**Asbestos**	**N/A**
			X
Was the Idaho National Engineering and Environmental Laboratory (INEEL) Radioanalytical DV Guide referenced/resourced? If no, enter any/all radioanalytical DV SOG/SOP referenced/resourced:	**Yes**	**No**	**N/A**
	X		

CHECKLIST			
Field QA/QC			
Was field documentation provided and complete?	**Yes**	**No**	**N/A**
	X		
Were calibration checks within project stabilization criteria (or other applicable range)?	**Yes**	**No**	**N/A**
	X		
Was chain-of-custody (COC) documentation accurate and complete?	**Yes**	**No**	**N/A**
	X		
Were all planned samples able to be collected?	**Yes**	**No**	**N/A**
	X		
ELF-1D, ELF-3, ELF-10, and ELF-17 were dry and unable to be sampled. This is reflected in the sample delivery group completion total.			
Were samples submitted within a reasonable time frame to meet extraction/prep and/or analytical hold times (HT)? If no, detail below.	**Yes**	**No**	**N/A**
		X	
❖ The laboratory flagged all pH results for hold time exceedance. The hold time for pH is 15 minutes. It is not feasible to laboratory-analyze samples within 15 minutes of collection. Stabilized field pH measurements are provided in field documentation. All analytical pH results were qualified as estimated (J). ❖ TDS in ELF-13 was qualified as estimated low (J-) due to analysis 13.8 days after collection, >7-day hold time.			
Were samples submitted received by the laboratory in good condition?	**Yes**	**No**	**N/A**
	X		
	Yes	**No**	**N/A**

Were samples received by the laboratory within temperature and pH requirements? If no, detail below.	X		

Were volatile samples collected with zero headspace, or was enough volume available for analysis without using any containers with bubbles? If no, detail below.	**Yes**	**No**	**N/A**
			X

Were field duplicate (FD) samples required?	**Yes**	**No**	**N/A**
	X		
Were FD samples collected at the correct frequency? If no, all field data points are qualified as estimated (J/UJ) due to lack of field precision QA/QC (FDX).	**Yes**	**No**	**N/A**
	X		

Were FD relative percent difference (RPD) results at or below control limits (CLs)? If no, detail below.	**Yes**	**No**	**N/A**
		X	

ELF-9 (original) and Duplicate – (CCR) (duplicate): representing all samples

- Lithium RPD was 41.1%, >20% CL. The original and duplicate sample results were >5xRL.
  - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
  - All remaining samples were qualified as estimated (J) due to detected results.
- Chloride RPD was 27.5%, >20% CL. The original and duplicate sample results were >5xRL.
  - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
  - All remaining samples were qualified as estimated (J) due to detected results.
    - ELF-12, ELF-13, ELF-14, ELF-15, ELF-16, and Duplicate – (CCR) were more specifically qualified as estimated low (J-) due to low MS recovery.
- Radium 228 RPD was 97.9%, >20% CL.
  - No qualification required due to a mean difference <3 (1.5).

Was field decontamination of sampling equipment required?	**Yes**	**No**	**N/A**
		X	
Were equipment rinse blank (ERB) samples required?	**Yes**	**No**	**N/A**
		X	
Were ERB samples collected at the correct frequency? If no, all field data points are qualified (J/UJ) as estimated due to lack of field QA/QC (ERBX).	**Yes**	**No**	**N/A**
			X

Were all ERB results non-detect (ND)? If no, detail below.	**Yes**	**No**	**N/A**
			X

Were field blank (FB) samples required?	**Yes**	**No**	**N/A**
	X		
Were FB samples collected at the correct frequency? If no, all data is qualified as estimated due to lack of field QA/QC (FBX).	**Yes**	**No**	**N/A**
	X		
Were all FB results ND? If no, detail below.	**Yes**	**No**	**N/A**
		X	

Field Blank – (CCR): representing all samples

- TDS was detected at 14 mg/L, ≥RL of 10 mg/L.
  - No qualification was required for any samples due to all results ≥10xFB.
- Radium-226 was detected at 0.294 pCi/l, ≥2σ, >0, and >MDC (DL).
  - ELF-16 was qualified as an estimated detection (J) due to a result >MDC (DL), a mean difference >2, and a difference factor <10.
    - ELF-16 was qualified as an estimated ND (J) due to MB detection. The J qualifier will override the UJ qualifier.
  - All remaining samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.
- Radium-228 was detected at 2.03 pCi/l, ≥2σ, >0, and >MDA.
  - ELF-6R, ELF-8, ELF-16, and Duplicate – (CCR) were qualified as estimated detections (J) due to results >MDC (DL), mean differences >2, and difference factors <10.
  - All remaining samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.

Were trip blank (TB) samples required (volatiles analyses)?	**Yes**	**No**	**N/A**
		X	
Were TB samples submitted as required (one per shipping container)? If no, all data is qualified as estimated due to lack of TB (TBX).	**Yes**	**No**	**N/A**
			X

Other issues? If yes, detail below.	Yes	No	N/A
		X	

Field QA/QC Summary

Out of 330 total data points:

- 256 data points (77.6%) remain unqualified.
- Out of 74 data points (22.4%) qualified as estimated:
  - 16 data points (21.6% of qualified, 4.8% of total) were due to HT exceedances.
  - No data points were due to preservation (temperature and/or pH) issues.
  - 28 data points (37.8% of qualified, 8.5% of total) were due to blank contamination.
  - 30 data points (40.5% of qualified, 9.1% of total) were due to poor replication.
- No data points were rejected.

Laboratory QA/QC

Did the laboratory use appropriate methods to extract/prep and analyze all samples within HT?	Yes	No	N/A
	X		

Were there any results reported below the RL or in exceedance of (E) or over (O) instrument calibration? If yes, detail below.	Yes	No	N/A
		X	

Other issues? If yes, detail below.	Yes	No	N/A
	X		

The laboratory did not complete Radium 226+228 as instructed. This is reflected in the work order completion total.

Laboratory Blanks

Were TB results ND? If no, detail below.	Yes	No	N/A
			X

Were method blank (MB) samples analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were MB results ND? If no, detail below.	Yes	No	N/A
		X	

- Method 903.0/9315
  - Batch WG2050046: all samples
    - Radium-226 was detected at 0.413 pCi/l, ≥2σ, >0, and >MDC (DL).
      - All samples were qualified as estimated ND (UJ) due to results >MDC (DL), mean differences between 0 and 2, and difference factors <10.
        - ELF-16 was qualified as an estimated detection (J) due to the FB detection. The J qualifier will override the UJ qualifier.
- Method 904/9320
  - Batch WG2056321: all samples except Field Blank – (CCR)
    - Radium-228 was detected at 0.280 pCi/l, ≥2σ, >0, and >MDC (DL).
      - ELF-16 was qualified as estimated ND (UJ) due to a result >MDC (DL), a mean difference between 0 and 2, and difference factor <10.
        - ELF-16 was qualified as an estimated detection (J) due to the FB detection. The J qualifier will override the UJ qualifier.
      - All remaining samples were qualified as estimated detections (J) due to results >MDC (DL), mean differences >2, and difference factors <10.
        - All samples except ELF-6R, ELF-8, ELF-16, and Duplicate – (CCR) were qualified as estimated ND (UJ) due to the FB detection. The J qualifier will override the UJ qualifier.

Laboratory Accuracy

Were initial/continuing calibration verification (ICV/CCV) analyses performed at the appropriate frequency?	Yes	No	N/A
	X		

Were ICV/CCV percent recoveries within CLs? If no, detail below.	Yes	No	N/A
	X		

Were laboratory fortified blanks (LFB) / control samples (LCS) analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were LFB/LCS percent recoveries within CLs? If no, detail below.	Yes	No	N/A
		X	

- Method E200.7
  - Batch BXD0533: Duplicate – (CCR) and Field Blank – (CCR)
    - Barium was recovered at 120%, >115% upper CL.
      - Duplicate – (CCR) was qualified as estimated high (J+) due to a detected result.
      - Field Blank – (CCR) did not require qualification due to a ND result.
    - Calcium was recovered at 119%, between the upper CL of 115% and the expanded upper CL of 140%.
      - Duplicate – (CCR) was qualified as estimated high (J+) due to a detected result.
      - Field Blank – (CCR) did not require qualification due to a ND result.

Were matrix spike (MS) samples analyzed at a frequency of one per 20 samples or one per batch?	Yes	No	N/A
	X		

Were MS percent recoveries within CLs? If no, detail below.	Yes	No	N/A
		X	

- Method 200.7
  - Batch BXD0255: ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-9, ELF-11, ELF-12, ELF-13, ELF-14, ELF-15, and ELF-16
    - 23D0472-10: ELF-13
      - Calcium was recovered at 347% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
      - Lithium was recovered at 163% (MS) and 190% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0256: ELF-2
    - 23D0472-01: ELF-2
      - Calcium was recovered at 314% (MS) and 359% (MSD), >130% upper CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
- Method 300.0
  - Batch BXD0289: ELF-2, ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-8, and ELF-9
    - 23D0472-01: ELF-2
      - Sulfate was recovered at 50.3% (MS) and 44.6% (MSD), <80% lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0313: ELF-12, ELF-13, ELF-14, ELF-15, ELF-16, Duplicate – (CCR) and Field Blank – (CCR)
    - 23D0430-01: unassociated work order
      - Chloride was recovered at 186% (MS) and 209% (MSD), >120% upper CL with QC ID BXD0313-MS(D)1. The parent sample result was ≥4x the spike concentration, thus no qualification was required.
      - Chloride was recovered at 76.4% (MS), <80% lower CL with QC ID BXD0313-MS(D)2. The parent sample result was <4x the spike concentration.
        - Field Blank – (CCR) was qualified as estimated (UJ) due to a ND result.
        - All remaining samples were qualified as estimated low (J-) due to detected results.
      - Sulfate was recovered at 7.36% (MS), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
  - Batch BXD0346: ELF-11
    - 23C2043-02: unassociated work order
      - Chloride was recovered at 12.7% (MS) and 16.9% (MSD), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.
      - Chloride was recovered at -162% (MS) and -161% (MSD), <80% lower CL and <35% expanded lower CL.
        - No qualification was required due to a parent sample result ≥4x the spike concentration.

Were surrogate recoveries within CLs (organics only)? If no, detail below.	Yes	No	N/A
			X

Laboratory Precision

Were laboratory duplicates analyzed at a frequency of one per 20 samples or one per batch, either through laboratory sample duplicates (LSD), LCS duplicates (LCSD), or MS duplicates (MSD)?	Yes	No	N/A
	X		

Were laboratory duplicate RPD results at or below CLs? If no, detail below.	Yes	No	N/A
		X	

- Method E903/9315
  - Batch WG2050046: all samples
    - L1604336-18: Field Blank - CCR
      - Radium-226 RPD was 83.2%, >20% CL.
        - No qualification was required due to a mean difference <3 (0.84).
- Method E904/9320

- Batch WG2056321: all samples except Field Blank - CCR
  - L1604336-01: unassociated sample delivery group
    - Radium-228 RPD was 200%, >20% CL.
      - No qualification required due to a laboratory-calculated RER <3 (1.33).
- Batch WG2057687: Field Blank - CCR
  - L1604350-01: unassociated work group
    - Radium-228 RPD was 200%, >20% CL.
      - No qualification required due to a laboratory-calculated RER <3 (1.22).

Were serial dilution (SD) samples analyzed at a frequency of one per 20 samples or one per batch (metals only)?	Yes	No	N/A
		X	

Were SD RPD results at or below CLs? If no, detail below.	Yes	No	N/A
			X

Laboratory QA/QC Summary

Out of 330 total data points:

- 292 data points (88.5% of total) remain unqualified.
- Out of 38 data points (11.5% of total) qualified as estimated:
  - No data points were due to detections below the RL or above the instrument upper calibration value or estimated values.
  - 29 data points (76.3% of qualified, 8.8% of total) were due to laboratory blank contamination.
  - 9 data points (23.7% of qualified, 2.7% of total) were due to poor accuracy (high LCS and low MS recoveries).
  - No data points were due to poor precision.
- No data points were rejected.

OVERALL SUMMARY

Data Quality

Out of 330 total data points:

- 253 data points (76.7%) remain unqualified and are considered quantitative.
- Out of 77 data points (23.3%) qualified as estimated and assigned as qualitative:
  - 74 data points (96.1% of qualified, 22.4% of total) due to field QA/QC.
  - 36 data points (46.8% of qualified, 10.9% of total) due to laboratory QA/QC.
- No data points were rejected.

Completeness

Out of 19 samples planned, 4 wells were dry and unable to be sampled, so 15 samples were completed. This sample delivery group is 78.9% complete. This is not reflective of quality.

Out of 120 analyses planned, the lab failed to complete Radium 226+228 analysis, so 105 analyses were completed. This work order is 87.5% complete. This is not reflective of quality.

Attachment C:

Statistical Analysis

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1.0 INTRODUCTION

This appendix contains a statistical analysis of the data collected from the groundwater monitoring network for the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to evaluate compliance vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient and downgradient water quality. Table C.1 lists the upgradient and downgradient wells that are used in this analysis. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix it means that no samples were able to be collected from that well.

Table C.1. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-3
ELF-2	ELF-4
ELF-9	ELF-5R
ELF-10	ELF-6R
	ELF-7
	ELF-8
	ELF-11
	ELF-12
	ELF-13
	ELF-14
	ELF-15
	ELF-16
	ELF-17

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis is to establish background values from the upgradient well data and compare these to the downgradient well data to determine if the downgradient water quality has been / remains impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

2.1.1 Mean

One measure of primary interest is the center of the data. The average ($\bar{x}$), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad (1)$$

Where:

$\bar{x}$ = mean

n = number of observations

x_i = i^{th} observation.

2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (s) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}} \quad (2)$$

Where:

s = standard deviation

n = number of observations

x_i = i^{th} observation

$\bar{x}$ = mean of the observations.

2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and

provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\bar{X}} \times 100\% \quad (3)$$

Where:

s = standard deviation

$\bar{X}$ = mean of the observations

2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25th percentile of the data, the median is the 50th percentile of the data, and the third quartile is the 75th percentile of the data. The 25th percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25th percentile. The median and third quartiles are found in a similar manner.

2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2023).

2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.

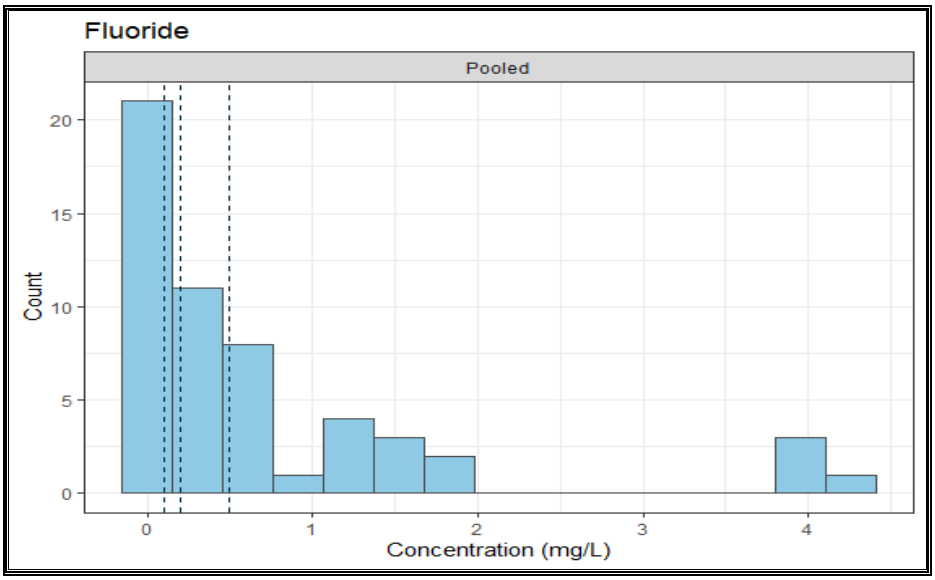

Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.

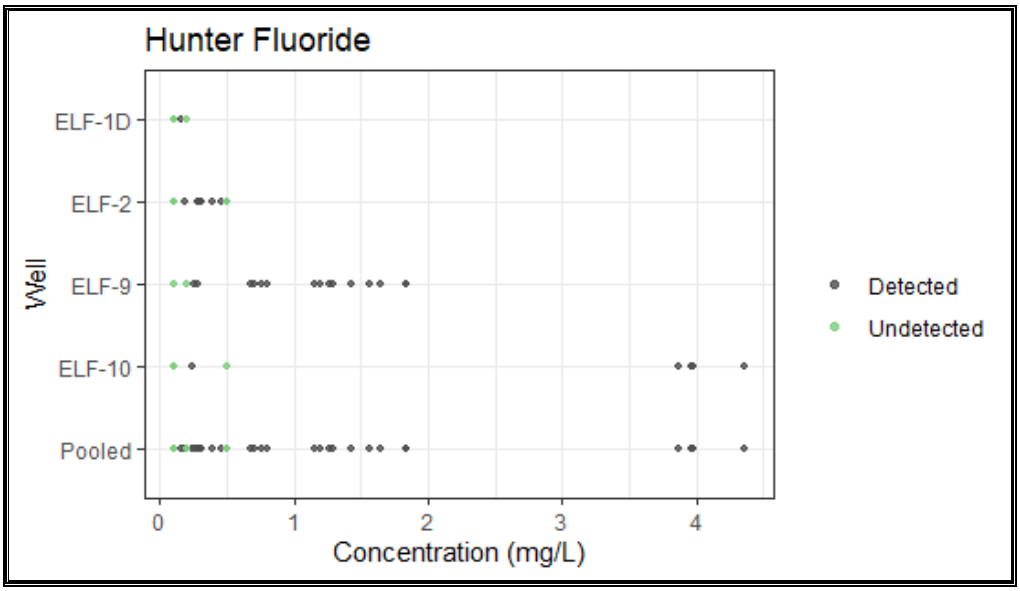

Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the arsenic, cadmium, chromium, fluoride, lead, and radium data for the CCR Landfill. However, only the arsenic and chromium outliers are extreme enough to warrant removal from the dataset. Figure C.5 shows the concentration of the arsenic outlier relative to the other observed arsenic concentrations. This outlier was not included in the Groundwater Protection Standard (GWPS) calculation because it would have resulted in an inflated GWPS. The MDLs for the non-detects in the boron upgradient data in February 2016 and August 2019 were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a GWPS that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix. The fluoride data for the May 2022 sampling event were all non-detects with unusually high detection limits so they were not included in the analysis. Fluoride was reassessed during the Spring 2023 sampling event and detection limits were within the normally expected ranges. Thus, the fluoride non-detects from the most recent sampling event is included in the calculations in this report.

2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The antimony, arsenic, cadmium, chromium, lead, and thallium data have more than 50% non-detects. Beryllium and mercury were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The cobalt, fluoride and selenium data have more than 15%

non-detects, but more than half of the data are detectable. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for cobalt, fluoride, and selenium.

2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary statistics were only computed for analytes and wells with at least 50% detects and at least eight positive results. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

Table C.2. Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Antimony	ELF-1D	5	0	<0.004	NA	NA	NA
Antimony	ELF-2	21	0	<0.002	NA	NA	NA
Antimony	ELF-9	19	3	<0.002	NA	NA	NA
Antimony	ELF-10	15	0	<0.002	NA	NA	NA
Antimony	Pooled	60	3	<0.002	NA	NA	NA
Arsenic	ELF-1D	5	0	<0.002	NA	NA	NA
Arsenic	ELF-2	21	3	<0.002	NA	NA	NA
Arsenic	ELF-9	19	19	0.0066	0.0067	0.0024	36
Arsenic	ELF-10	14	3	<0.002	NA	NA	NA
Arsenic	Pooled	59	25	<0.002	NA	NA	NA
Barium	ELF-1D	5	5	0.0103	NA	NA	NA
Barium	ELF-2	21	20	0.0102	0.0137	0.0096	70
Barium	ELF-9	19	19	0.0160	0.0330	0.0309	94
Barium	ELF-10	15	15	0.0353	0.0384	0.0214	56
Barium	Pooled	60	59	0.0136	0.0256	0.0237	93
Boron	ELF-1D	4	4	2.15	NA	NA	NA
Boron	ELF-2	20	20	3.29	3.31	0.19	6
Boron	ELF-9	17	17	1.36	1.43	0.21	15
Boron	ELF-10	14	14	1.60	1.63	0.18	11
Boron	Pooled	55	55	1.84	2.22	0.87	39
Cadmium	ELF-1D	5	0	<0.0005	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Cadmium	ELF-2	21	1	<0.0005	NA	NA	NA
Cadmium	ELF-9	19	1	<0.0005	NA	NA	NA
Cadmium	ELF-10	15	6	<0.0005	NA	NA	NA
Cadmium	Pooled	60	8	<0.0005	NA	NA	NA
Calcium	ELF-1D	4	4	372	NA	NA	NA
Calcium	ELF-2	20	20	397	395	24.3	6
Calcium	ELF-9	18	18	62.5	76.2	30.9	41
Calcium	ELF-10	14	14	477	479	35.5	7
Calcium	Pooled	56	56	389	312	170	55
Chloride	ELF-1D	4	4	6760	NA	NA	NA
Chloride	ELF-2	20	20	304	329	122	37
Chloride	ELF-9	18	18	381	392	100.7	26
Chloride	ELF-10	14	14	7600	8918	2506	28
Chloride	Pooled	56	56	452	2958	4034	136
Chromium	ELF-1D	5	1	<0.002	NA	NA	NA
Chromium	ELF-2	21	3	<0.002	NA	NA	NA
Chromium	ELF-9	19	7	<0.0036	NA	NA	NA
Chromium	ELF-10	15	11	0.003	0.0049	0.0039	81
Chromium	Pooled	60	22	<0.002	NA	NA	NA
Cobalt	ELF-1D	5	1	<0.004	NA	NA	NA
Cobalt	ELF-2	21	13	0.0048	0.0057	0.0026	45
Cobalt	ELF-9	19	5	<0.004	NA	NA	NA
Cobalt	ELF-10	15	11	0.0043	0.0049	0.0013	27
Cobalt	Pooled	60	30	0.004	0.0047	0.002	43
Fluoride	ELF-1D	4	1	<0.132	NA	NA	NA
Fluoride	ELF-2	19	9	<0.103	NA	NA	NA
Fluoride	ELF-9	17	15	1.16	1.00	0.58	58
Fluoride	ELF-10	14	5	<0.1	NA	NA	NA
Fluoride	Pooled	54	30	0.268	0.74	1.07	145
Lead	ELF-1D	5	0	<0.002	NA	NA	NA
Lead	ELF-2	21	2	<0.002	NA	NA	NA
Lead	ELF-9	19	4	<0.002	NA	NA	NA
Lead	ELF-10	15	6	<0.002	NA	NA	NA
Lead	Pooled	60	12	<0.002	NA	NA	NA
Lithium	ELF-1D	5	5	2.19	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Lithium	ELF-2	21	21	1.64	2.21	1.11	50
Lithium	ELF-9	19	19	1.03	1.05	0.41	39
Lithium	ELF-10	15	15	2.17	2.35	0.99	42
Lithium	Pooled	60	60	1.61	1.88	1.02	54
Molybdenum	ELF-1D	5	5	0.0161	NA	NA	NA
Molybdenum	ELF-2	21	20	0.003	0.0031	0.0007	24
Molybdenum	ELF-9	19	19	0.106	0.0937	0.0378	40
Molybdenum	ELF-10	15	15	0.0795	0.0735	0.0393	53
Molybdenum	Pooled	60	59	0.0336	0.0504	0.0494	98
pH	ELF-1D	4	4	7.22	NA	NA	NA
pH	ELF-2	20	20	7.26	7.30	0.157	2
pH	ELF-9	18	18	7.92	7.92	0.146	2
pH	ELF-10	14	14	7.18	7.26	0.411	6
pH	Pooled	56	56	7.37	7.48	0.387	5
Radium	ELF-1D	5	5	2.2	NA	NA	NA
Radium	ELF-2	21	21	1.63	1.97	1.58	80
Radium	ELF-9	19	18	1.5	1.49	0.563	38
Radium	ELF-10	15	15	2.41	3.02	3.24	107
Radium	Pooled	60	59	1.805	2.11	1.97	94
Selenium	ELF-1D	5	0	<0.002	NA	NA	NA
Selenium	ELF-2	21	21	0.0879	0.228	0.233	102
Selenium	ELF-9	19	4	<0.002	NA	NA	NA
Selenium	ELF-10	15	10	0.009	0.0983	0.139	142
Selenium	Pooled	60	35	0.0042	0.106	0.181	171
Sulfate	ELF-1D	4	4	8790	NA	NA	NA
Sulfate	ELF-2	20	20	7950	7764	690	9
Sulfate	ELF-9	18	18	6500	6518	723	11
Sulfate	ELF-10	14	14	14950	14718	4789	33
Sulfate	Pooled	56	56	7950	9190	4085	44
TDS	ELF-1D	4	4	26900	NA	NA	NA
TDS	ELF-2	20	20	12000	12010	459	4
TDS	ELF-9	18	18	10550	10640	803	8
TDS	ELF-10	14	14	38000	37443	2387	6
TDS	Pooled	56	56	12000	18990	11553	61
Thallium	ELF-1D	5	0	<0.002	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Thallium	ELF-2	21	1	<0.002	NA	NA	NA
Thallium	ELF-9	19	0	<0.002	NA	NA	NA
Thallium	ELF-10	15	0	<0.002	NA	NA	NA
Thallium	Pooled	60	1	<0.002	NA	NA	NA

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

Table C.3. Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Antimony	ELF-1D	<0.002	<0.004	<0.004	<0.004	<0.004
Antimony	ELF-2	<0.0005	<0.002	<0.002	<0.004	<0.004
Antimony	ELF-9	<0.0006	<0.002	<0.002	<0.004	0.004
Antimony	ELF-10	<0.001	<0.002	<0.002	<0.0033	<0.004
Antimony	Pooled	<0.0005	<0.002	<0.002	<0.004	0.004
Arsenic	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-2	<0.0007	<0.002	<0.002	<0.002	0.002
Arsenic	ELF-9	0.0025	0.0052	0.0066	0.0074	0.0117
Arsenic	ELF-10	<0.002	<0.002	<0.002	<0.002	0.0093
Arsenic	Pooled	<0.0007	<0.002	<0.002	0.0052	0.0117
Barium	ELF-1D	0.0084	0.0085	0.0103	0.0103	0.0104
Barium	ELF-2	<0.0084	0.0097	0.0102	0.012	0.050
Barium	ELF-9	0.0118	0.0127	0.0160	0.0379	0.102
Barium	ELF-10	0.0145	0.0195	0.0353	0.051	0.0863
Barium	Pooled	<0.0084	0.0104	0.0136	0.0334	0.102
Boron	ELF-1D	1.94	2.06	2.15	2.20	2.23
Boron	ELF-2	2.94	3.17	3.29	3.41	3.77
Boron	ELF-9	1.16	1.31	1.36	1.50	1.91
Boron	ELF-10	1.39	1.54	1.60	1.67	2.12
Boron	Pooled	1.16	1.50	1.84	3.21	3.77
Cadmium	ELF-1D	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Cadmium	ELF-2	<0.0002	<0.0005	<0.0005	<0.0005	0.0010
Cadmium	ELF-9	<0.0002	<0.0005	<0.0005	<0.0005	0.0005
Cadmium	ELF-10	<0.0005	<0.0005	<0.0005	0.0006	0.0011
Cadmium	Pooled	<0.0002	<0.0005	<0.0005	<0.0005	0.0011
Calcium	ELF-1D	353	363	372	381	393
Calcium	ELF-2	342	382	397	415	430
Calcium	ELF-9	48.9	57.1	62.5	86.2	166
Calcium	ELF-10	407	460	477	503	543
Calcium	Pooled	48.9	90.6	389	429	543
Chloride	ELF-1D	6430	6588	6760	6960	7200
Chloride	ELF-2	187	213	304	449	473
Chloride	ELF-9	242	320	381	460	595
Chloride	ELF-10	5710	7128	7600	11325	13100
Chloride	Pooled	187	308	452	6813	13100
Chromium	ELF-1D	<0.002	<0.002	<0.002	<0.002	0.0023
Chromium	ELF-2	<0.001	<0.002	<0.002	<0.002	0.066
Chromium	ELF-9	<0.002	<0.002	<0.0036	0.0054	0.0201
Chromium	ELF-10	<0.002	<0.002	0.003	0.0061	0.0164
Chromium	Pooled	<0.001	<0.002	<0.002	0.005	0.066
Cobalt	ELF-1D	<0.004	<0.004	<0.004	<0.004	0.0054
Cobalt	ELF-2	<0.0032	<0.004	0.0048	0.006	0.0131
Cobalt	ELF-9	<0.0005	<0.004	<0.004	0.004	0.0052
Cobalt	ELF-10	<0.004	<0.004	0.0043	0.0052	0.0079
Cobalt	Pooled	<0.0005	<0.004	0.004	0.0051	0.0131
Fluoride	ELF-1D	<0.1	<0.1	<0.1315	0.1723	0.200
Fluoride	ELF-2	<0.1	<0.1	<0.103	0.3515	0.500
Fluoride	ELF-9	<0.1	0.678	1.16	1.43	1.84
Fluoride	ELF-10	<0.1	<0.1	<0.1	3.03	4.36
Fluoride	Pooled	<0.1	<0.1	0.268	0.788	4.36
Lead	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	ELF-2	<0.0005	<0.002	<0.002	<0.002	0.0021
Lead	ELF-9	<0.0005	<0.002	<0.002	<0.002	0.0077
Lead	ELF-10	<0.002	<0.002	<0.002	0.0028	0.012
Lead	Pooled	<0.0005	<0.002	<0.002	<0.002	0.012
Lithium	ELF-1D	1.96	2.12	2.19	2.2	2.89
Lithium	ELF-2	1.34	1.52	1.64	2.14	4.93

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Lithium	ELF-9	0.724	0.792	1.03	1.08	2.48
Lithium	ELF-10	0.841	1.82	2.17	2.90	4.59
Lithium	Pooled	0.724	1.08	1.61	2.18	4.93
Molybdenum	ELF-1D	0.0087	0.0153	0.0161	0.0165	0.0207
Molybdenum	ELF-2	<0.002	0.0027	0.003	0.0034	0.005
Molybdenum	ELF-9	0.0322	0.0614	0.106	0.123	0.158
Molybdenum	ELF-10	0.0131	0.0428	0.0795	0.111	0.124
Molybdenum	Pooled	<0.002	0.0033	0.0336	0.100	0.158
pH	ELF-1D	7.02	7.13	7.22	7.28	7.30
pH	ELF-2	7.12	7.20	7.26	7.41	7.76
pH	ELF-9	7.51	7.87	7.92	8.03	8.19
pH	ELF-10	6.85	6.99	7.18	7.38	8.37
pH	Pooled	6.85	7.20	7.37	7.87	8.37
Radium	ELF-1D	1.09	1.23	2.2	2.63	4.4
Radium	ELF-2	0.61	0.99	1.63	2.29	8.1
Radium	ELF-9	<0.64	1.15	1.5	1.88	2.6
Radium	ELF-10	0.46	1.67	2.41	3.14	14.2
Radium	Pooled	<0.46	1.13	1.805	2.40	14.2
Selenium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	ELF-2	0.0031	0.0084	0.0879	0.451	0.608
Selenium	ELF-9	<0.0012	<0.002	<0.002	<0.002	0.0095
Selenium	ELF-10	<0.002	<0.002	0.009	0.152	0.410
Selenium	Pooled	<0.0012	<0.002	0.0042	0.115	0.608
Sulfate	ELF-1D	7730	8413	8790	9380	10700
Sulfate	ELF-2	6030	7310	7950	8215	8720
Sulfate	ELF-9	5460	5855	6500	7035	8030
Sulfate	ELF-10	8610	10075	14950	19675	20700
Sulfate	Pooled	5460	6845	7950	9013	20700
TDS	ELF-1D	25000	26350	26900	27425	28700
TDS	ELF-2	11300	11675	12000	12300	13100
TDS	ELF-9	9420	10150	10550	11125	12000
TDS	ELF-10	32900	35750	38000	39350	40300
TDS	Pooled	9420	11275	12000	29750	40300
Thallium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	ELF-2	<0.0002	<0.002	<0.002	<0.002	0.002
Thallium	ELF-9	<0.0002	<0.002	<0.002	<0.002	<0.002

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Thallium	ELF-10	<0.001	<0.002	<0.002	<0.002	<0.002
Thallium	Pooled	<0.0002	<0.002	<0.002	<0.002	0.002

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results
- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

$\bar{X}$ = the average of the background data
κ = multiplier from EPA Unified Guidance, March 2009
S = standard deviation of the background data

3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals that outliers are present in the data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

Note: The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison.

A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium, pH, and radium. Non-parametric UTLs were computed for all of the analytes except for lithium, pH, and radium.

Table C.4. Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7183	<0.0001	No
Boron	0.8324	<0.0001	No
Calcium	0.8107	<0.0001	No
Chloride	0.6877	<0.0001	No
Cobalt	0.7405	<0.0001	No
Fluoride	0.6345	<0.0001	No
Lithium	0.8728	<0.0001	No
Cube Root of Lithium	0.9487	0.0136	Yes
Molybdenum	0.8435	<0.0001	No
pH	0.9295	0.0028	No
Cube Root of pH	0.9325	0.0038	Yes
Radium	0.5609	<0.0001	No
LN of Radium	0.9604	0.0490	Yes

Analyte	W-Statistic	P-Value	Normal
Selenium	0.6272	<0.0001	No
Sulfate	0.7074	<0.0001	No
TDS	0.7016	<0.0001	No

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

- If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.
- If the data were not normally distributed or more than 50% of the data were non-detects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 shows graphs that were constructed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS. Results above the GWPS line represent values exceeding the GWPS.

As the graphs illustrate, boron, cobalt, lithium, and molybdenum exceeded site-specific background or the GWPS. Table C.5 lists site-specific background values, maximum contaminant limits MCLs, the GWPS and the wells that exceed the GWPS for each analyte. GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient wells to the Groundwater Protection Standard

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.0025	0.004	0.004	Within Limit
Boron[a]	3.77	NA	3.77	ELF-4, ELF-5R, ELF-6R, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit
Calcium	543	NA	543	Within Limit
Chloride	13100	NA	13100	Within Limit
Chromium	0.066	0.1000	0.1000	Within Limit
Cobalt	0.0131	0.006	0.0131	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.22	0.04	4.22	ELF-6R
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.56	NA	6.56	Within Limit
pH Basic Range	8.48	NA	8.48	Within Limit
Radium	6.1	5.0	6.1	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

[a] New monitoring well ELF-16 exhibited concentrations in excess of the background UTL for boron and the GWPS for lithium. ELF-16 was installed in 2022 as a boundary well for the landfill and as yet does not have eight independent measurements. As a result, it is not shown in Table C.5.

4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were done correctly. During the Spring 2023 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituents:

- Boron

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Cobalt
- Lithium
- Molybdenum

5.0 REFERENCES

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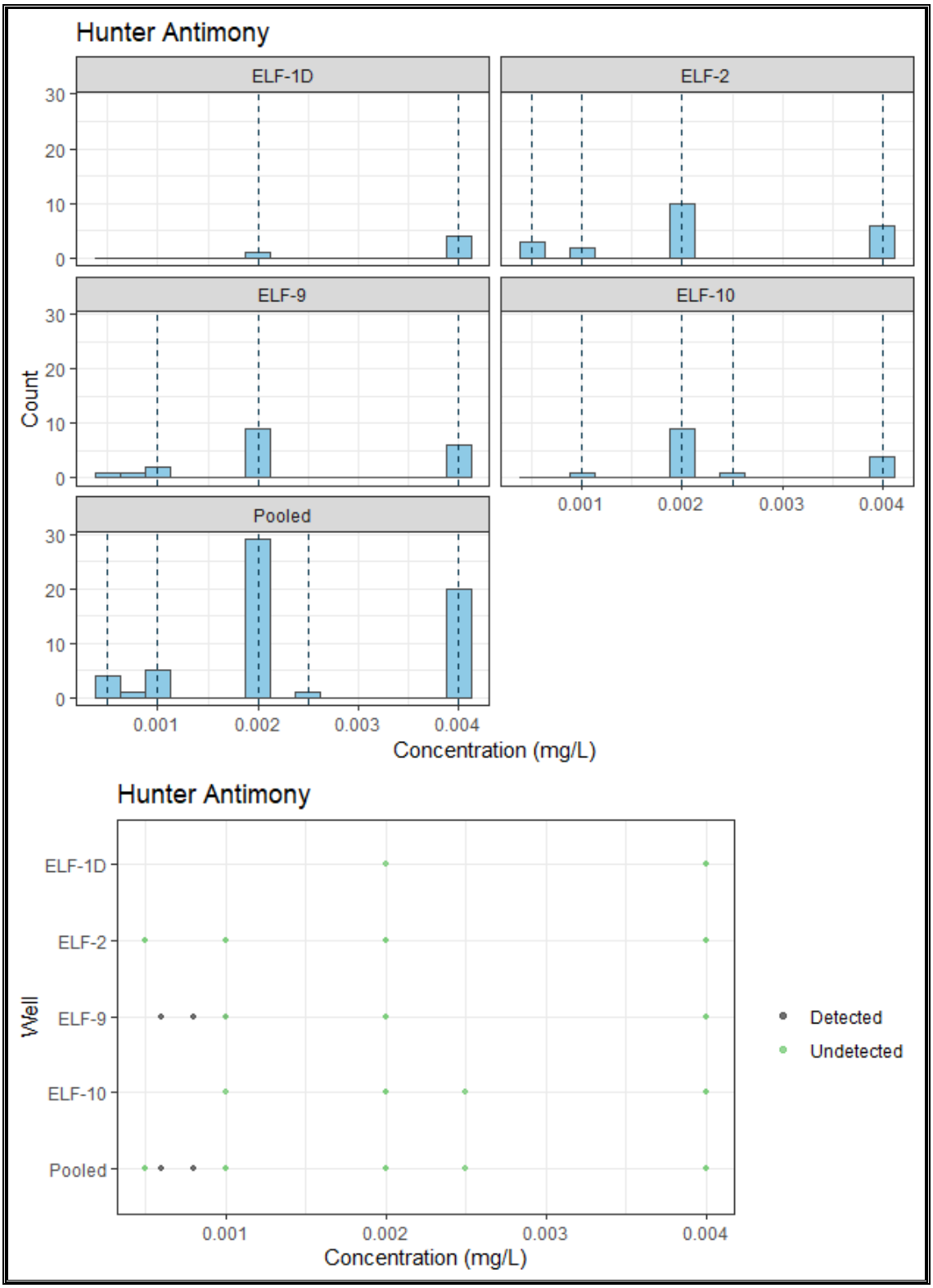

Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

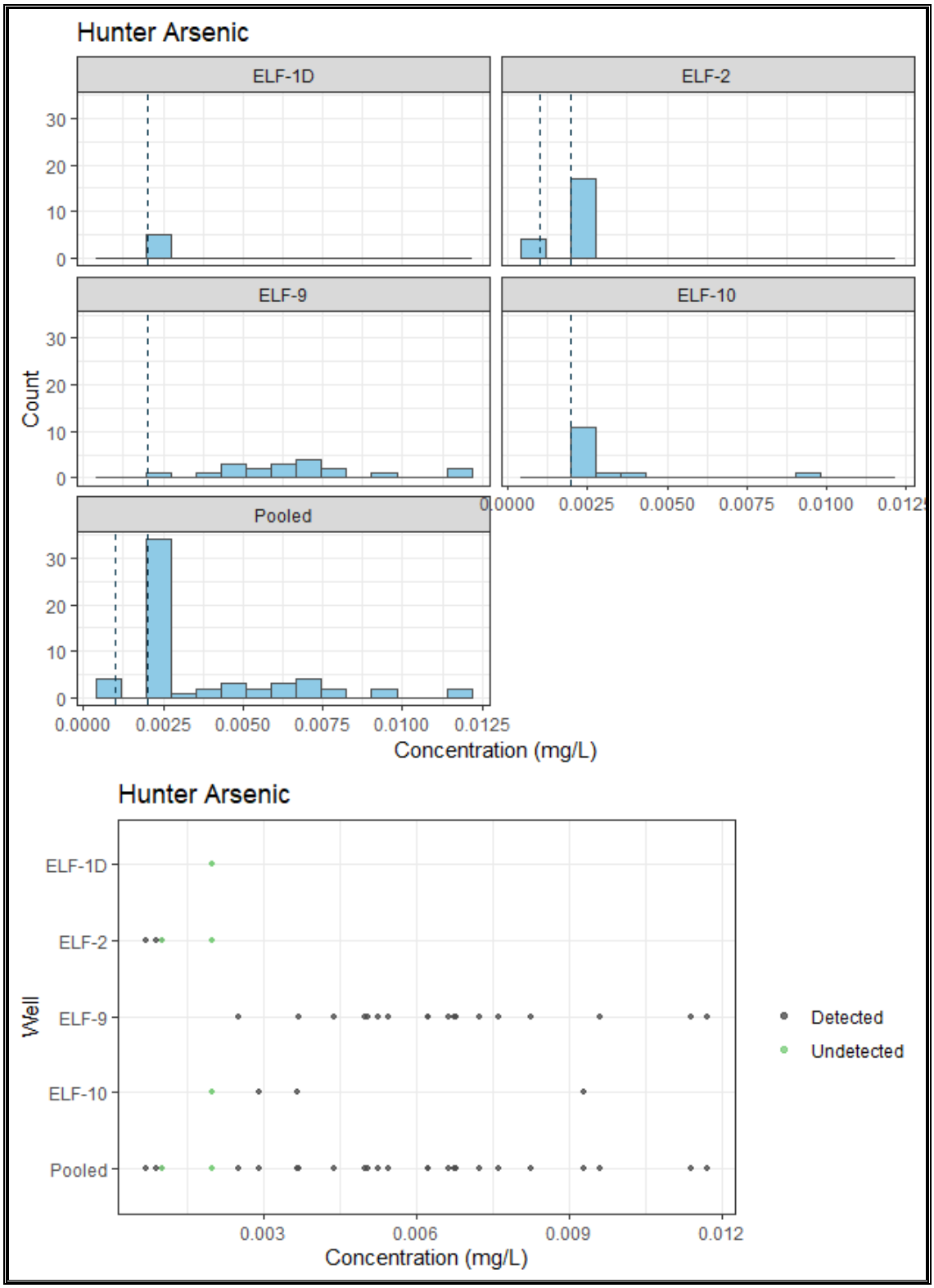

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

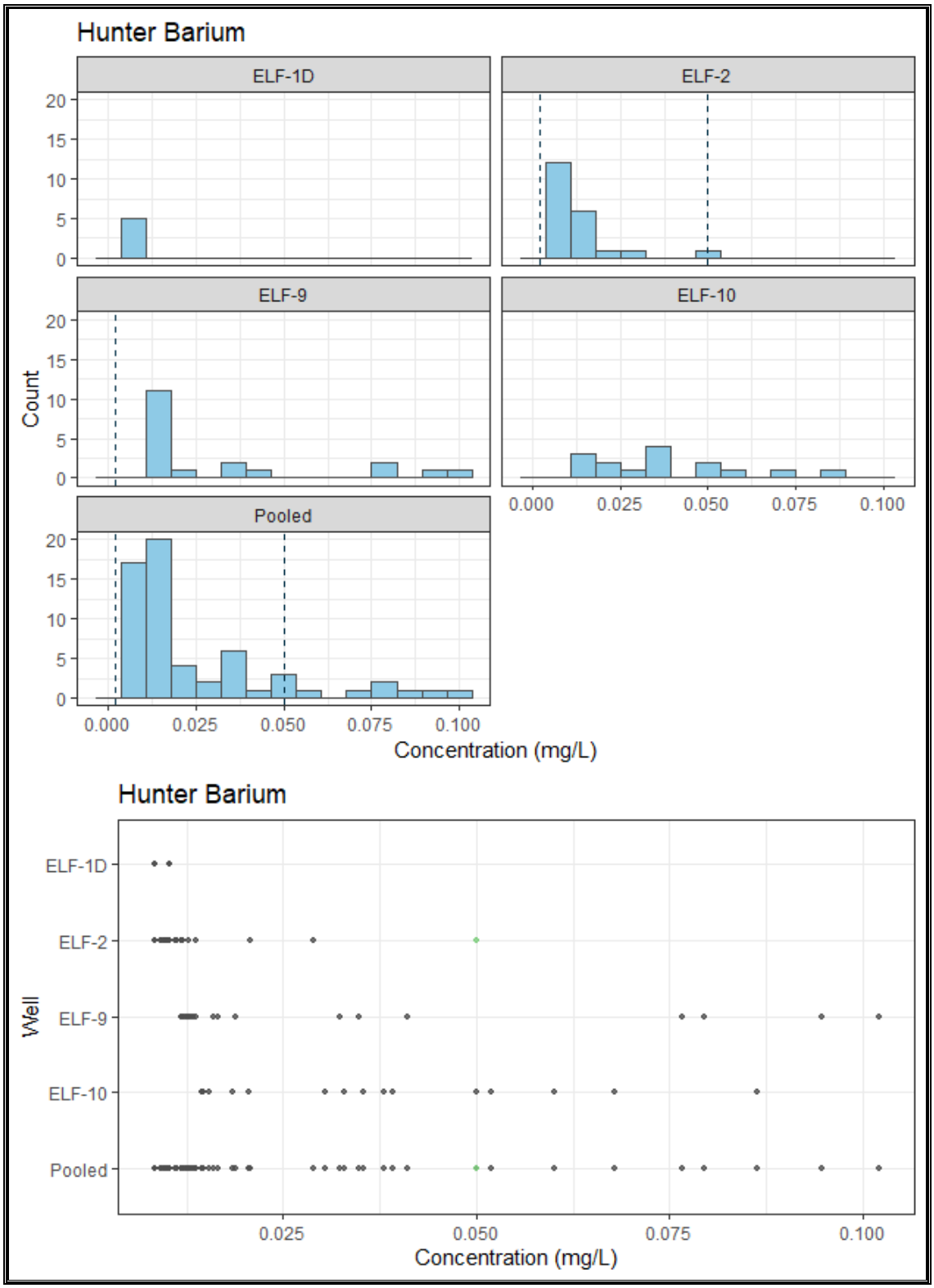

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

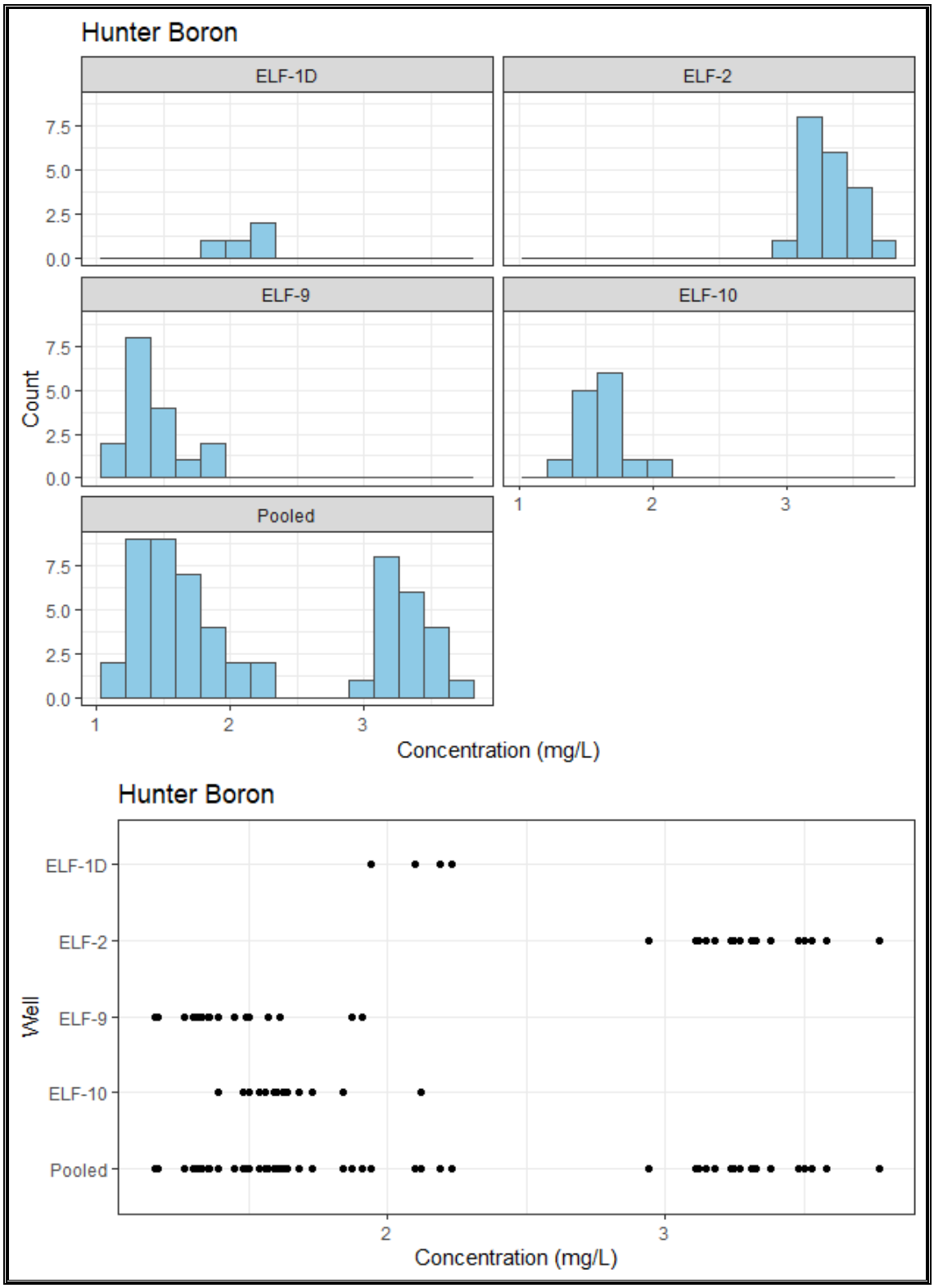

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

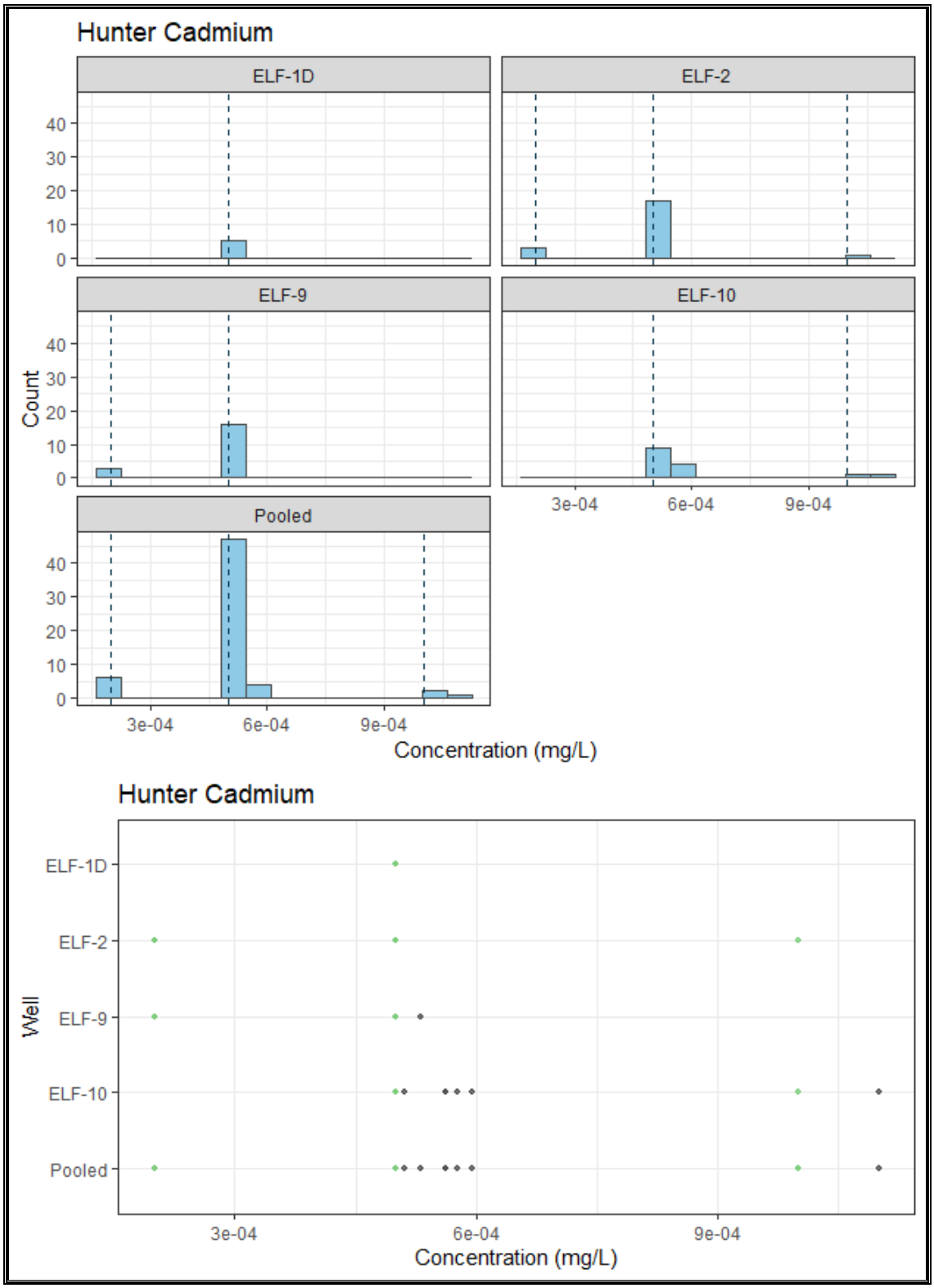

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

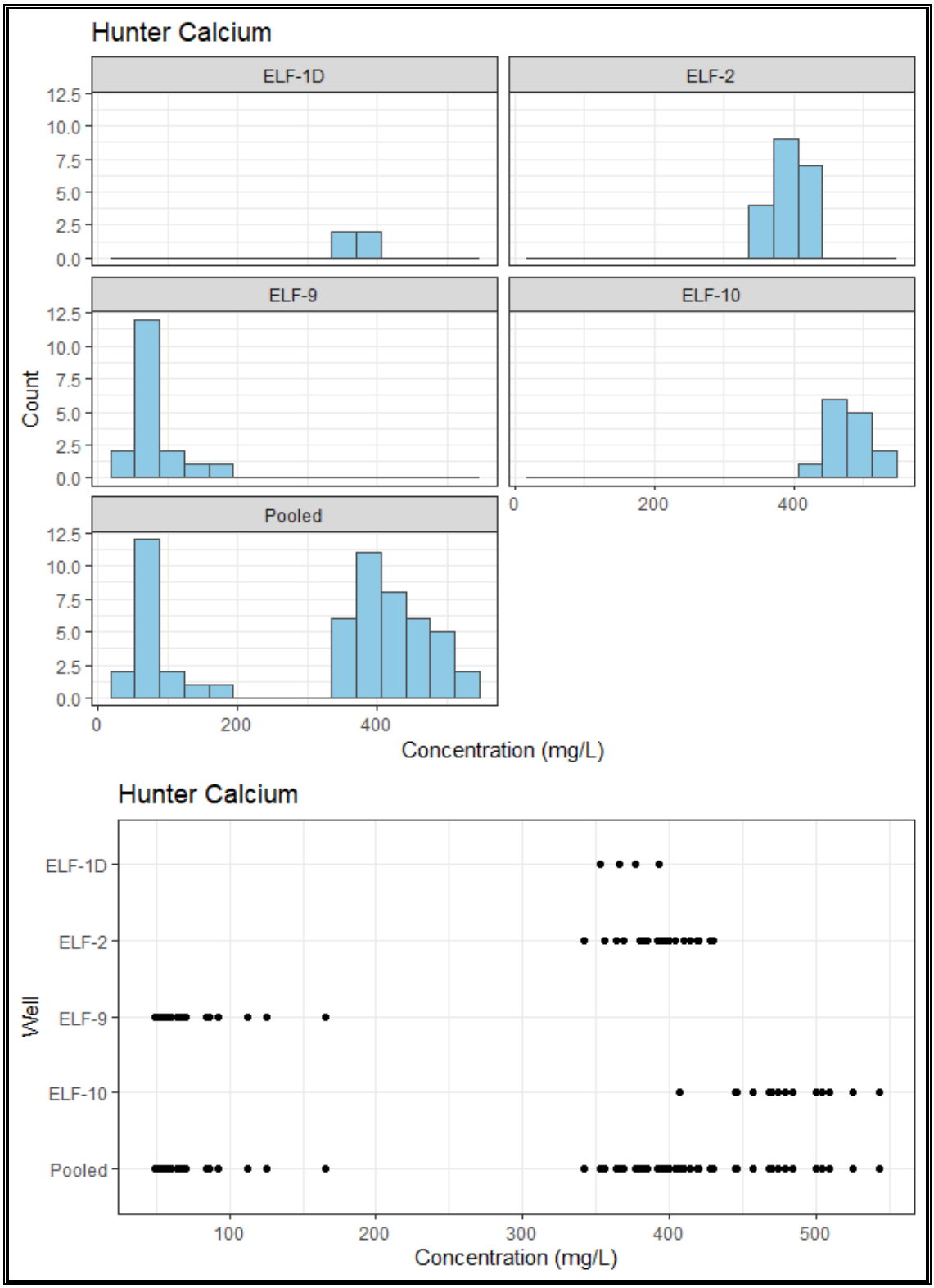

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

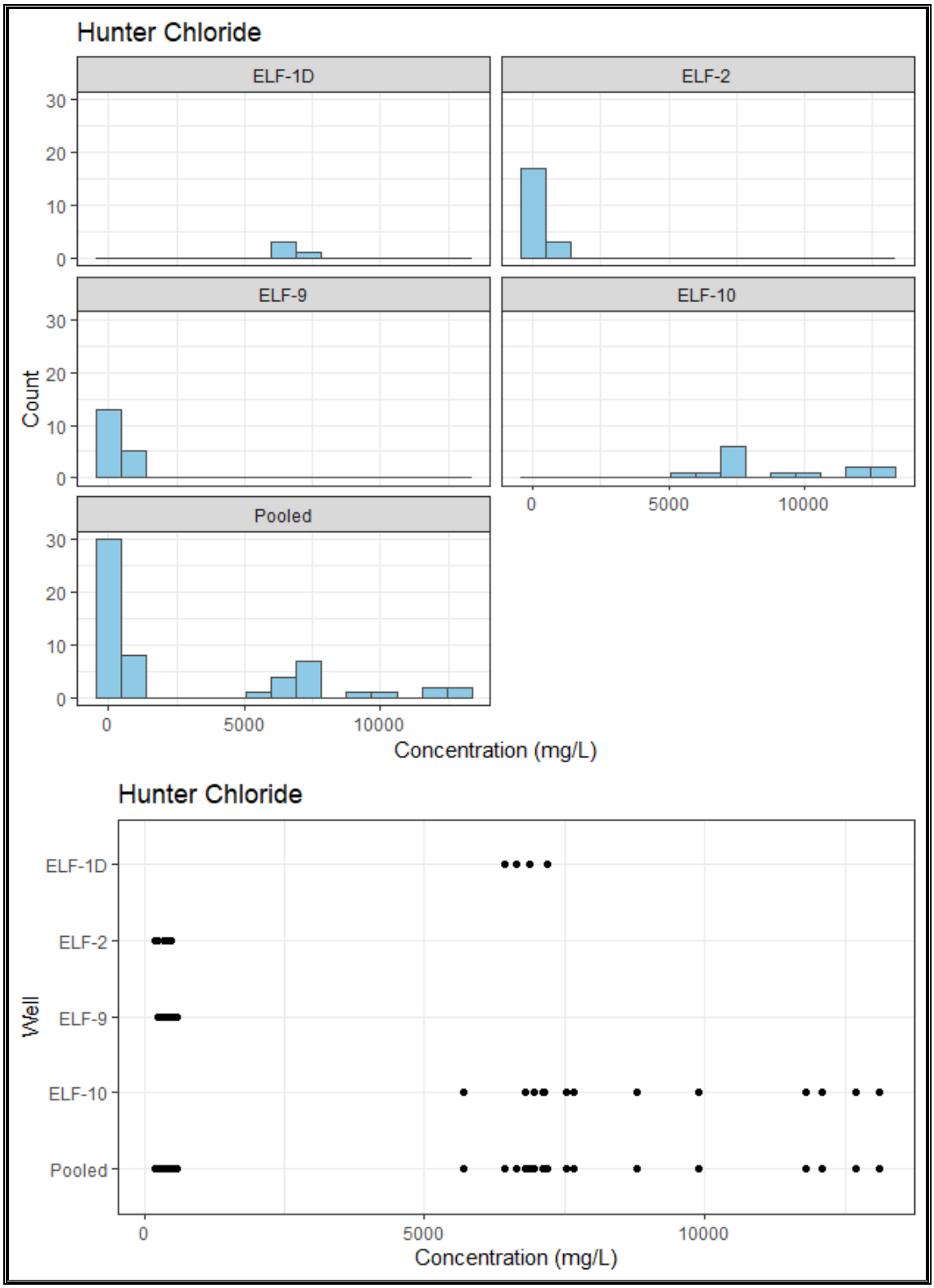

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

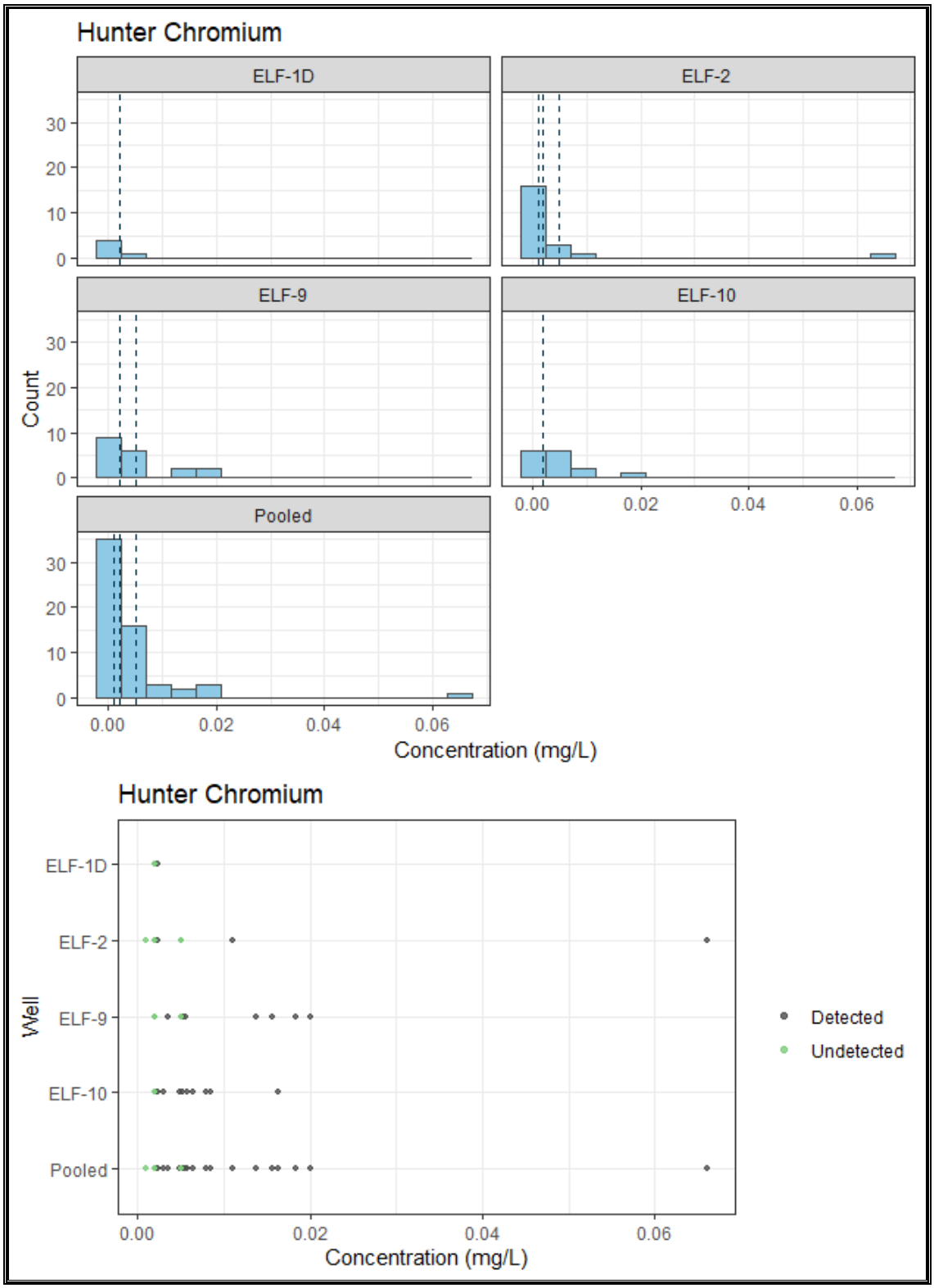

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

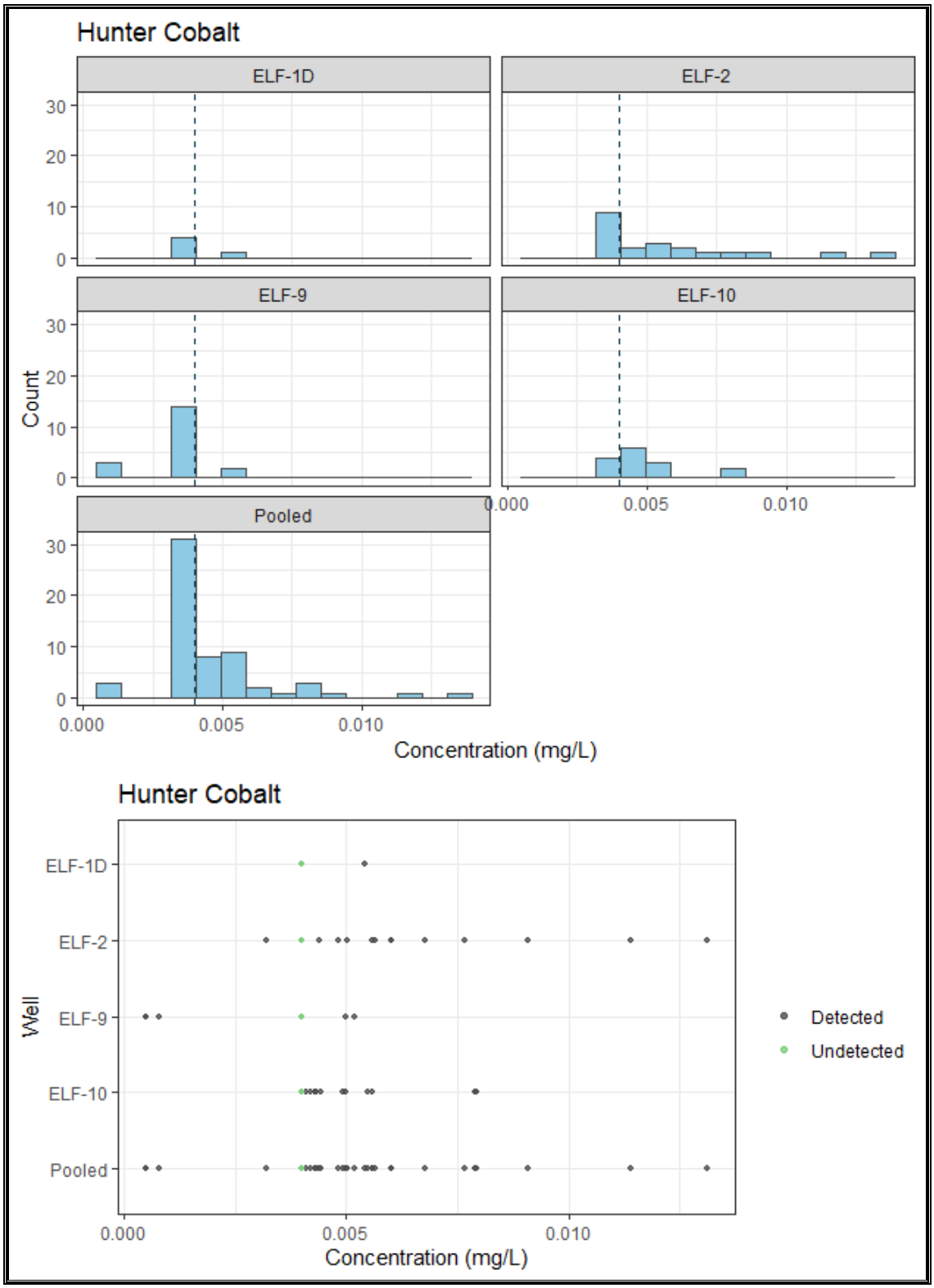

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

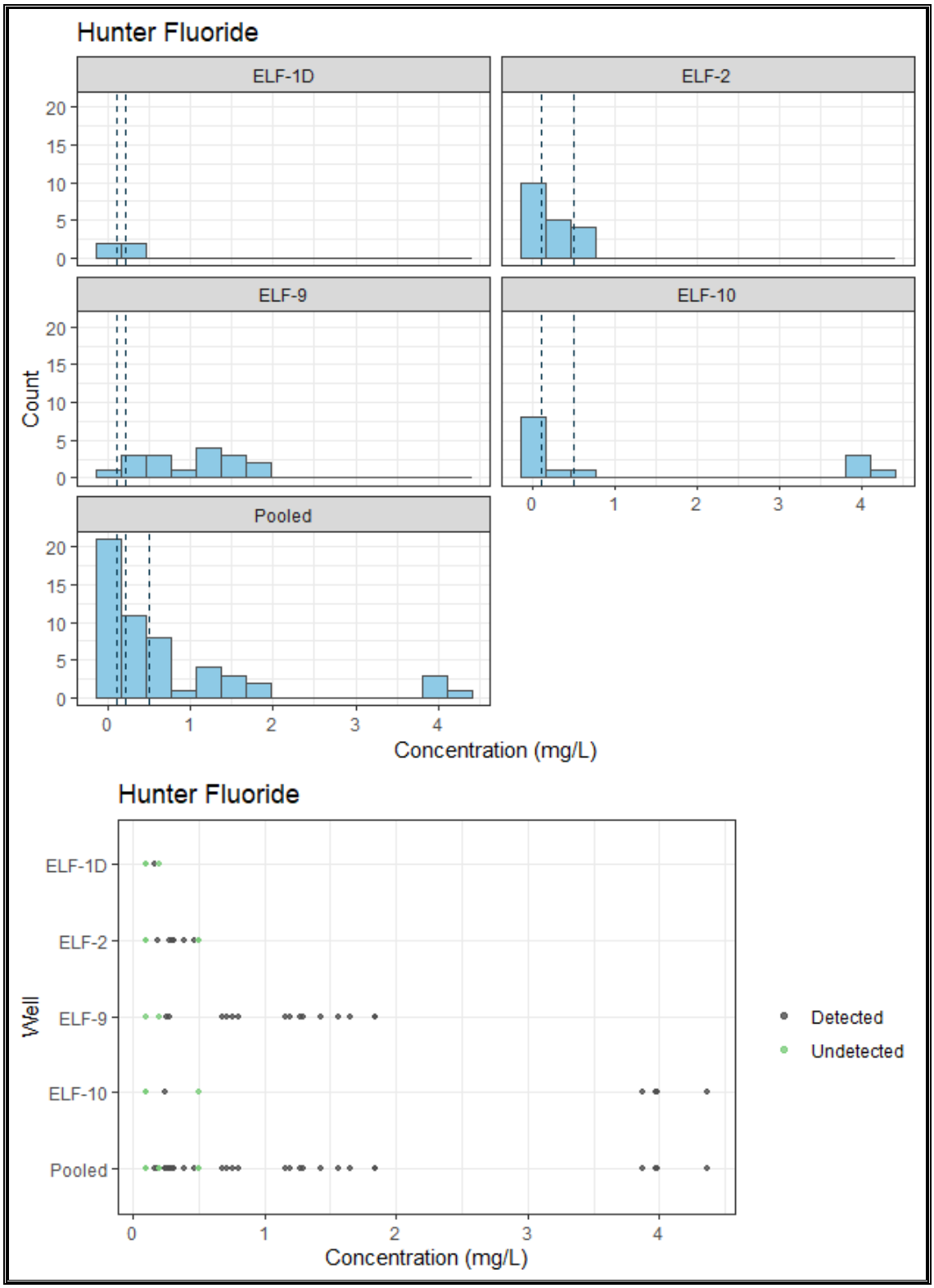

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

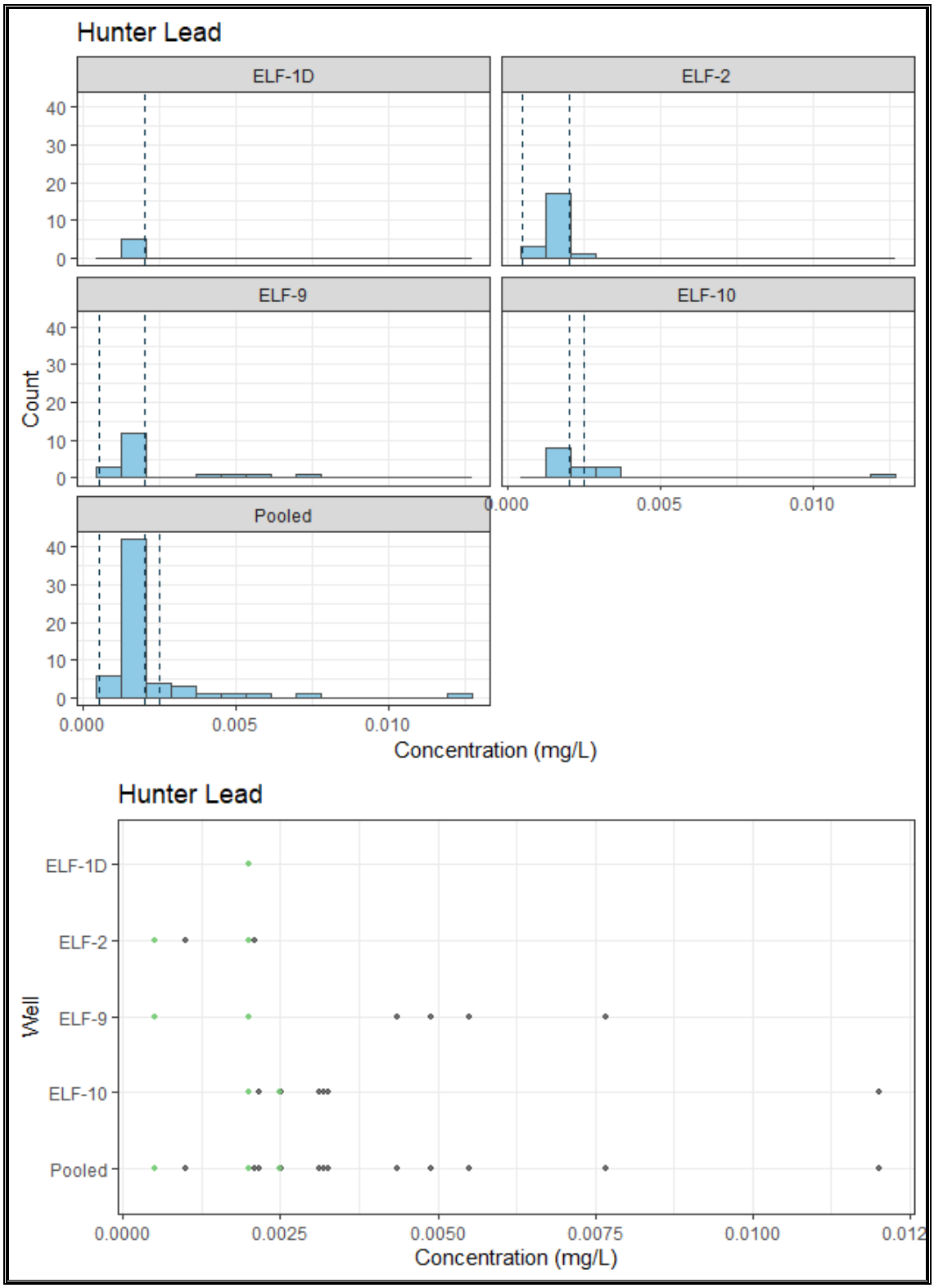

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

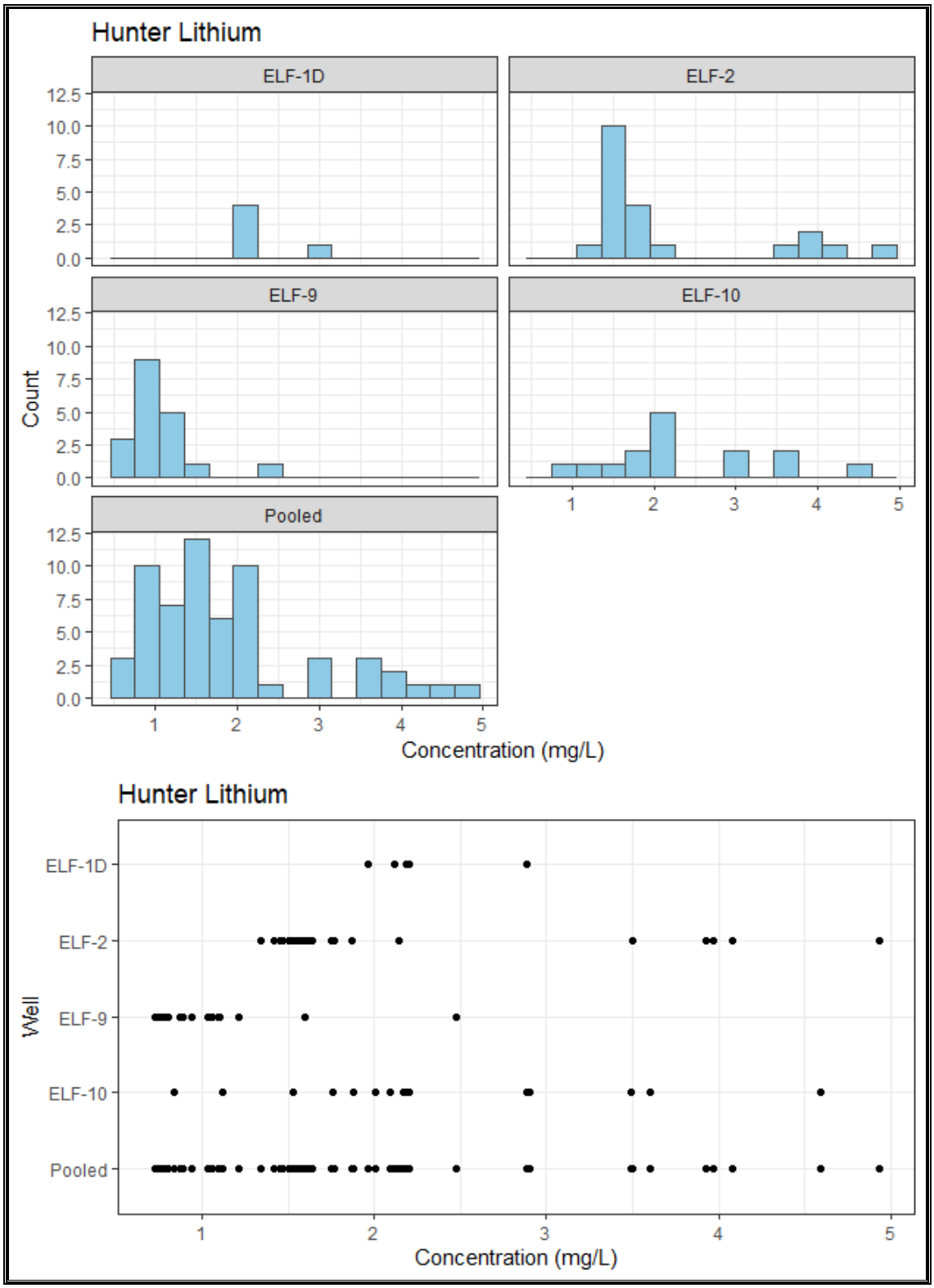

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

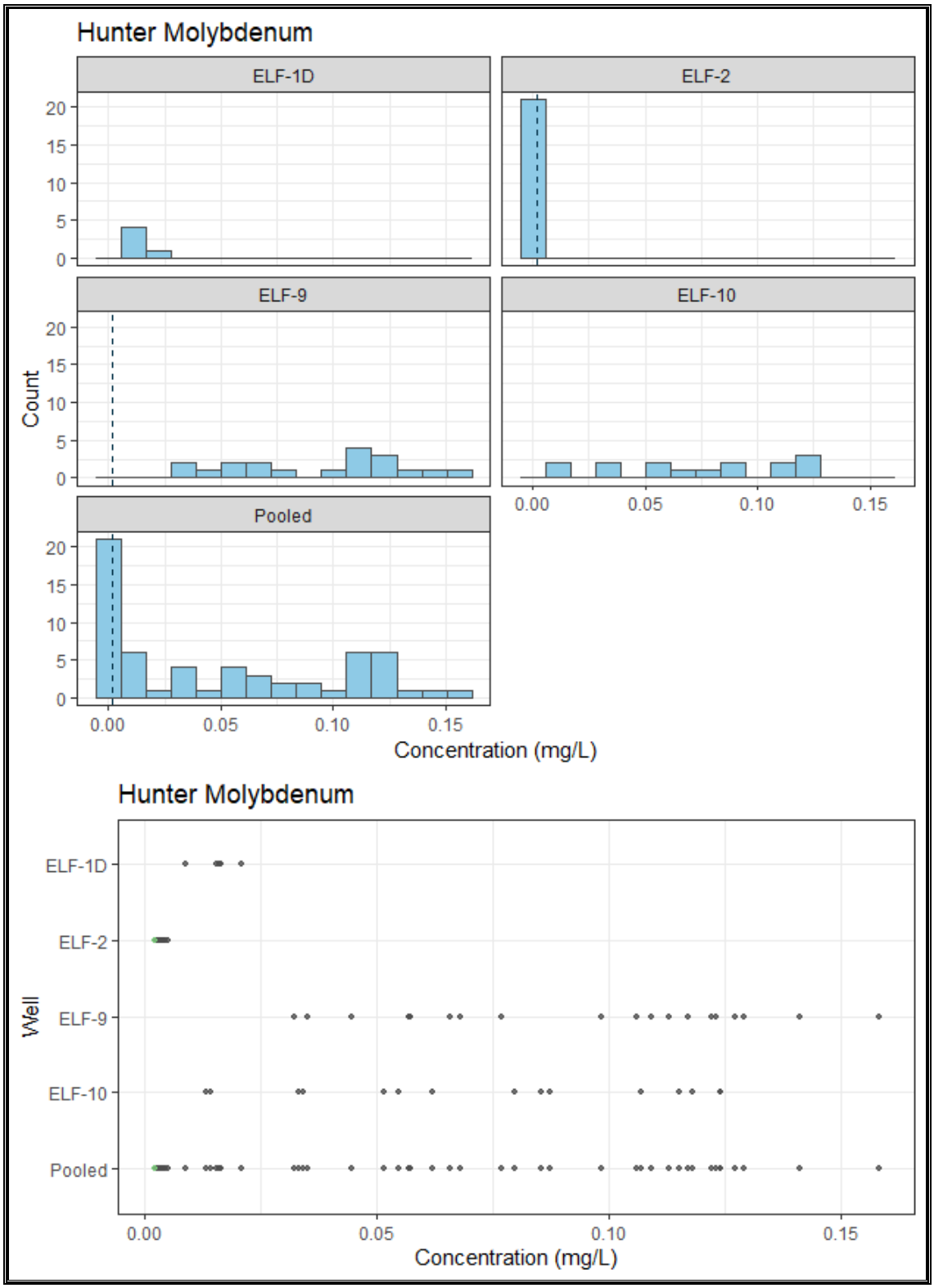

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

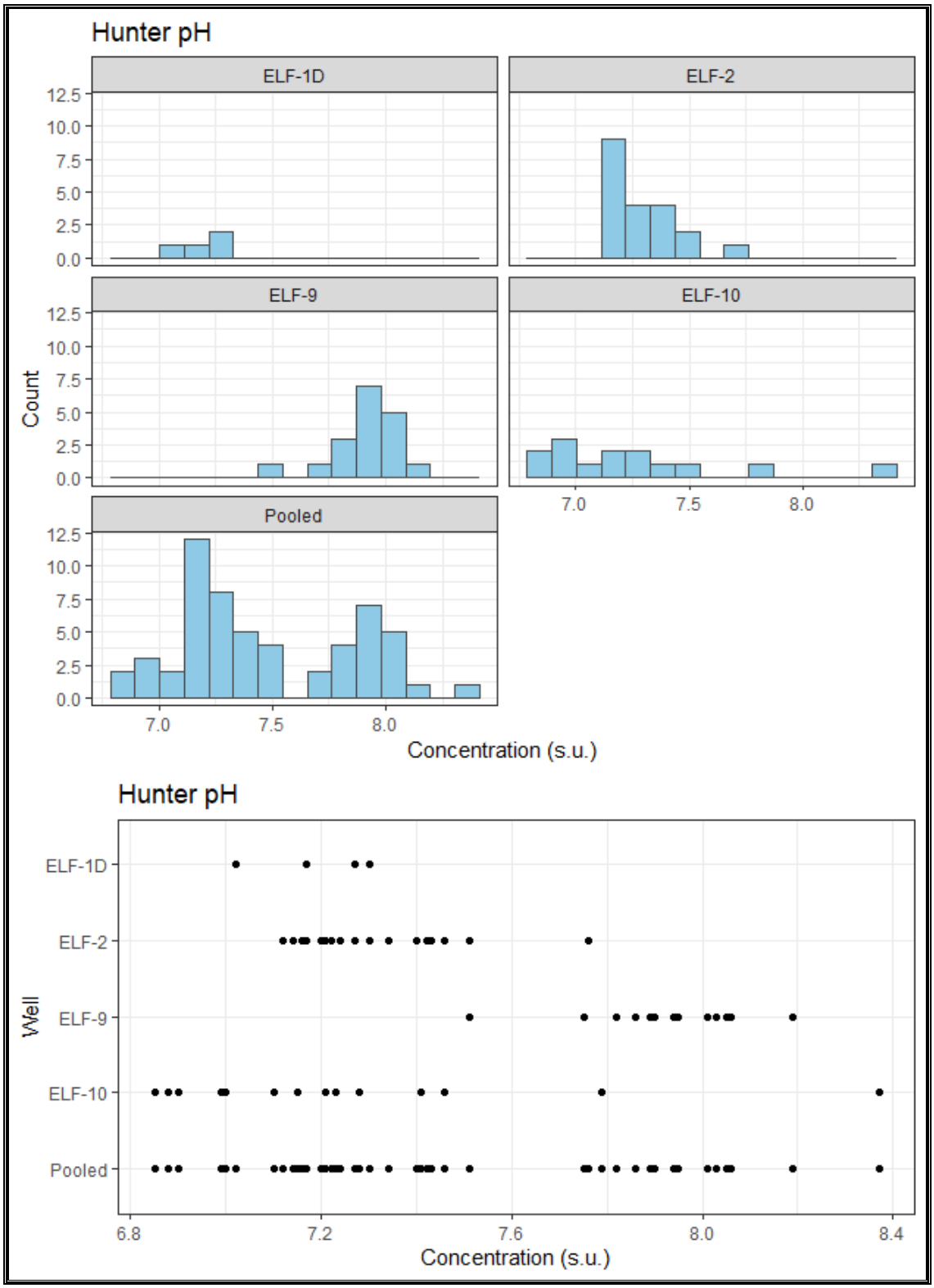

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

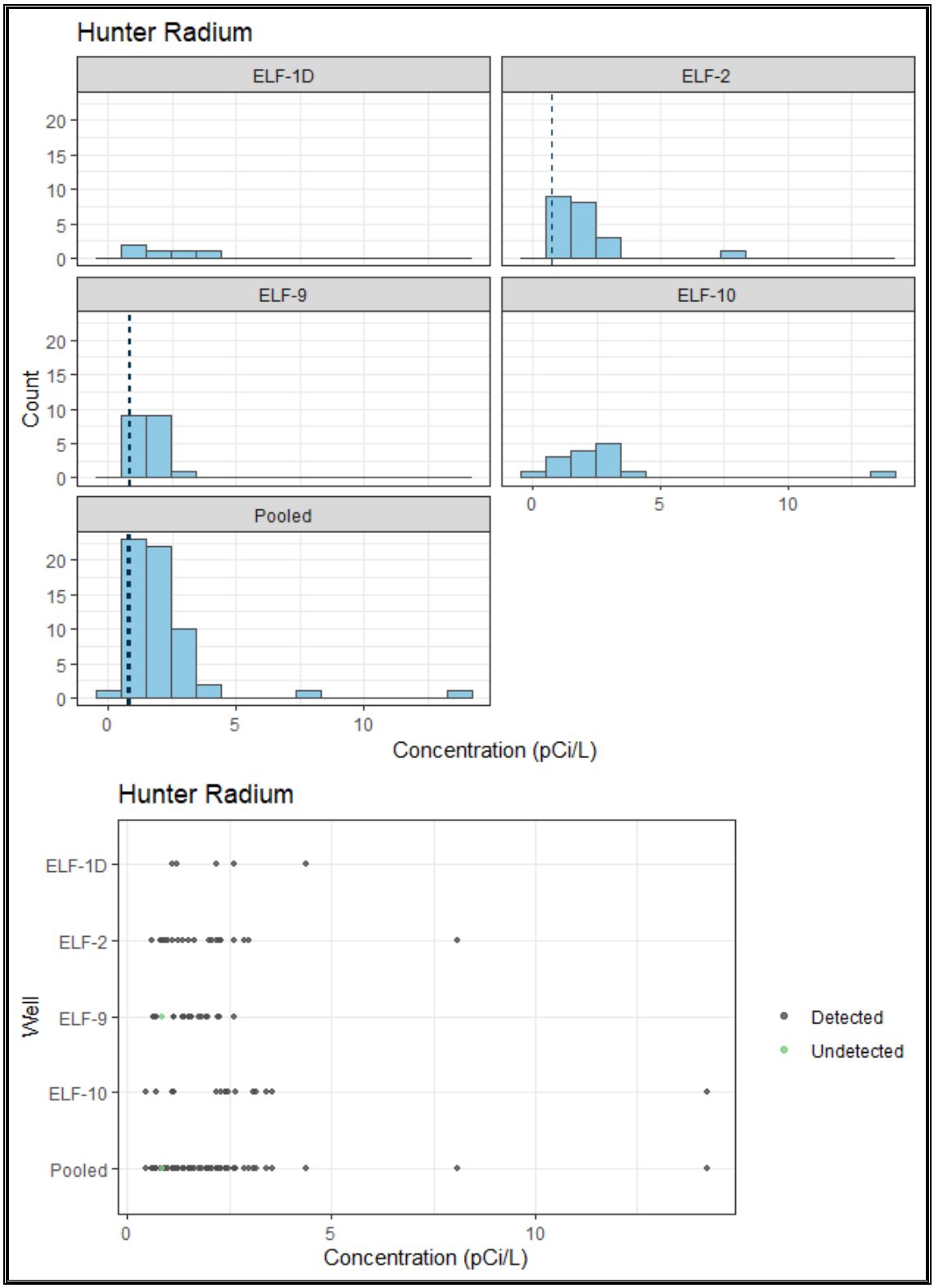

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

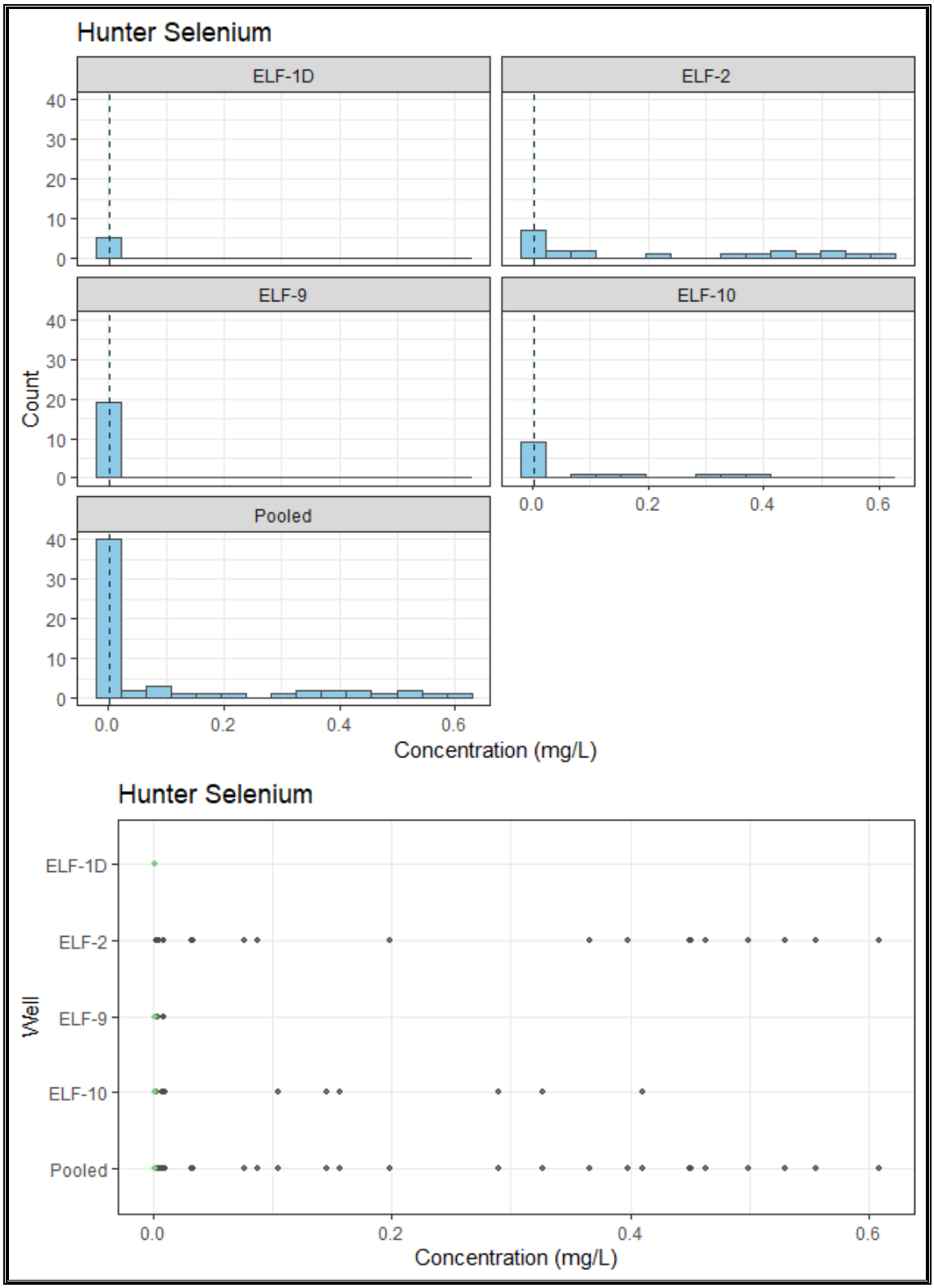

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

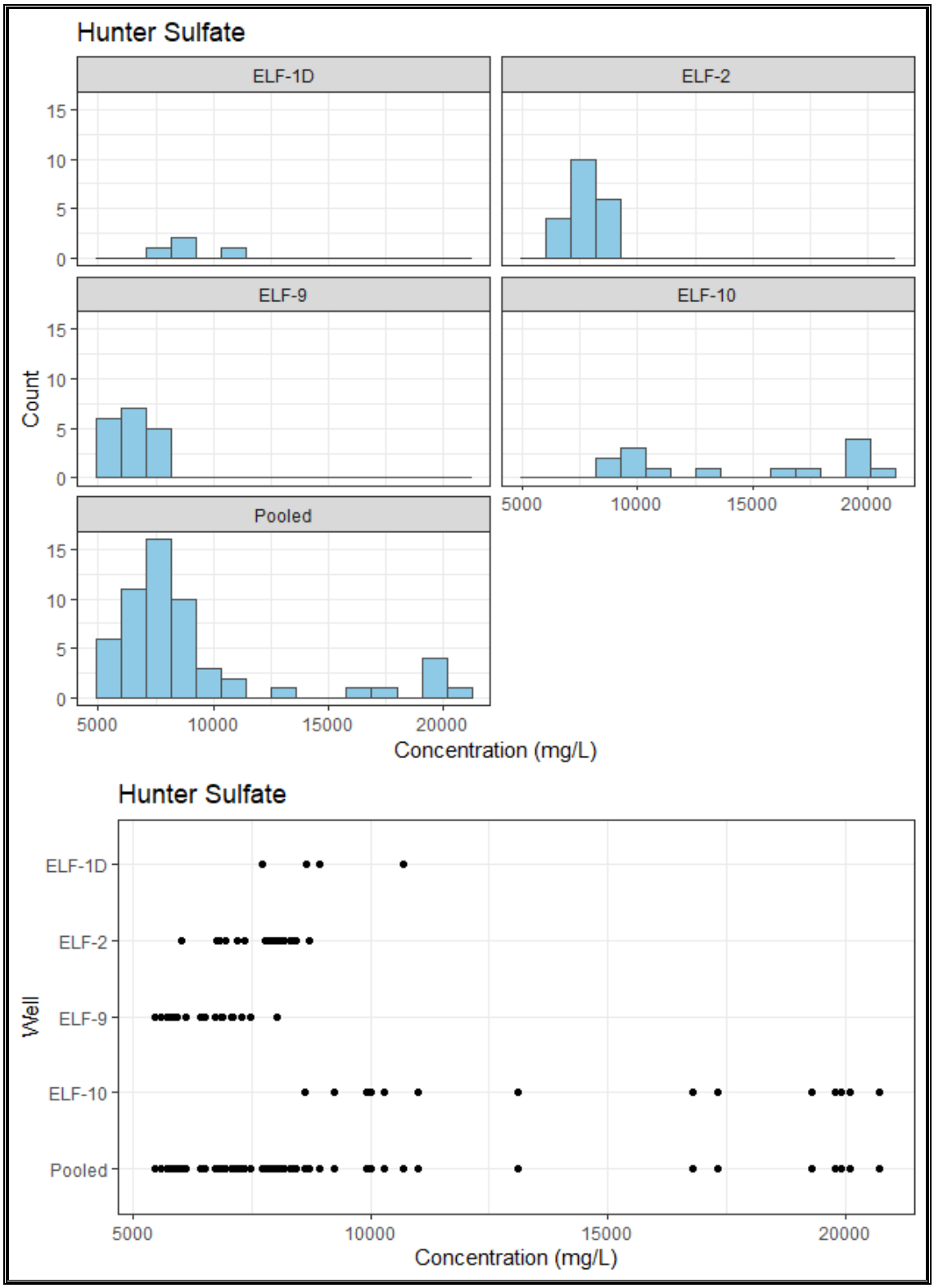

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

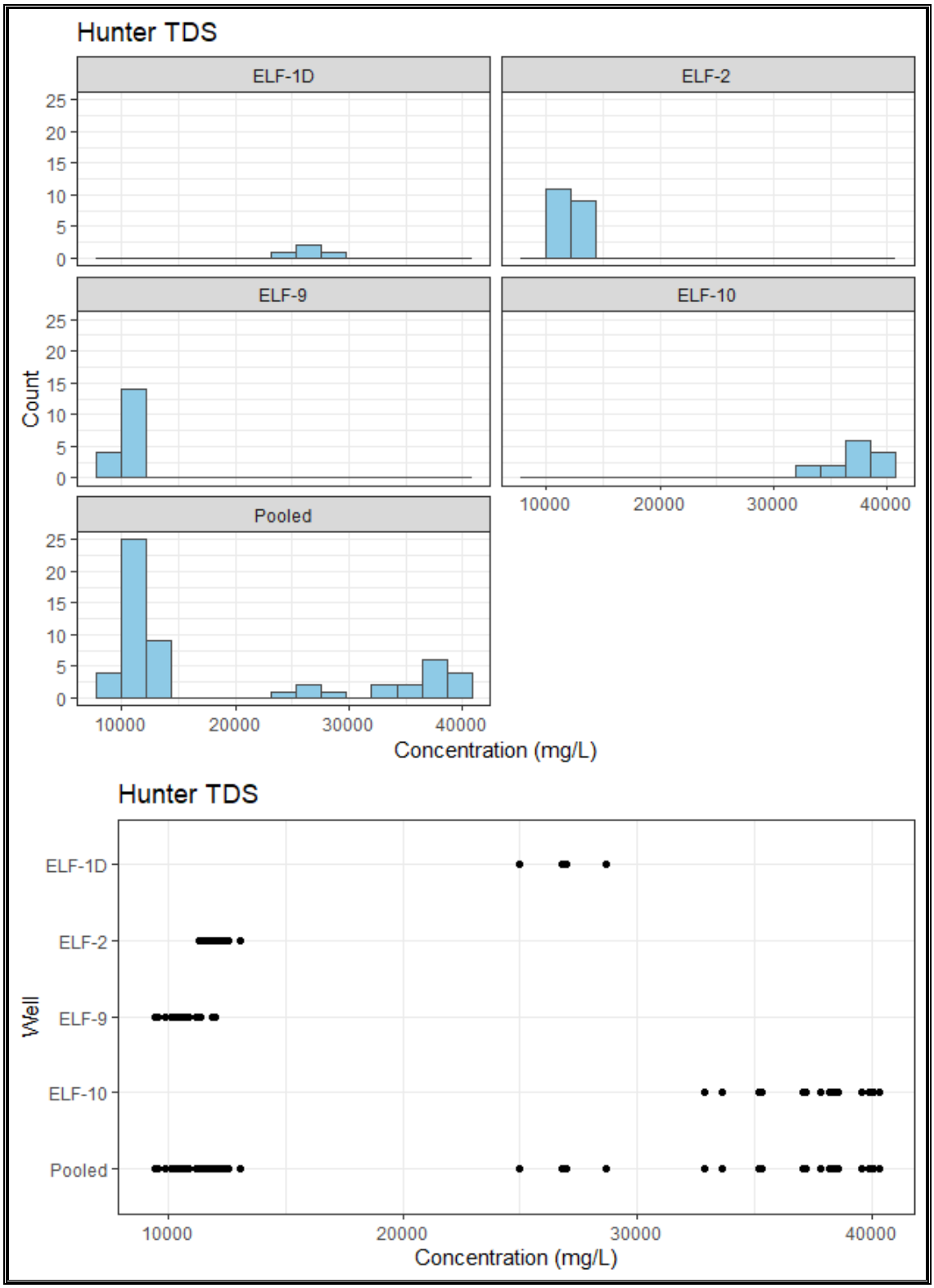

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

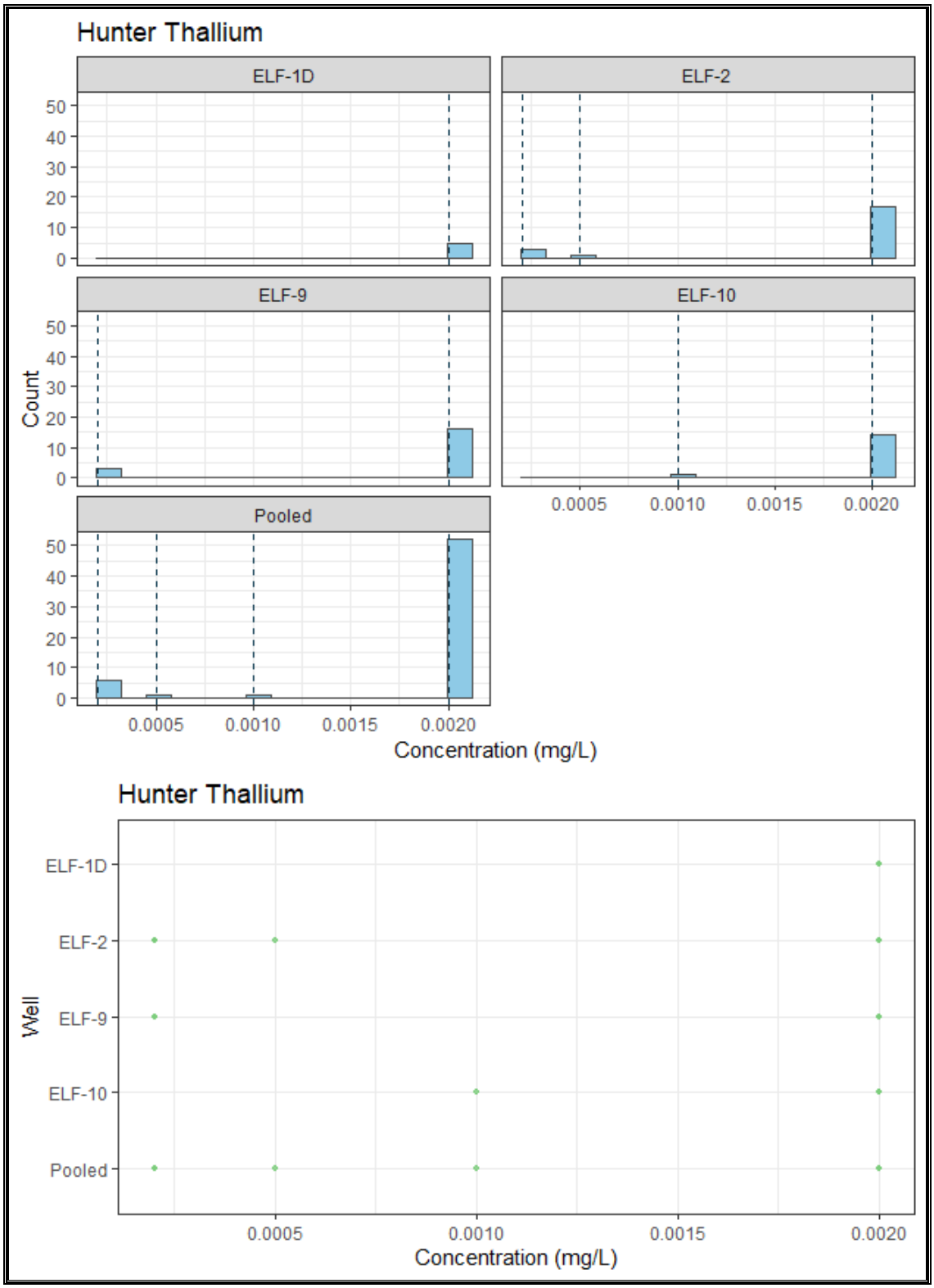

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

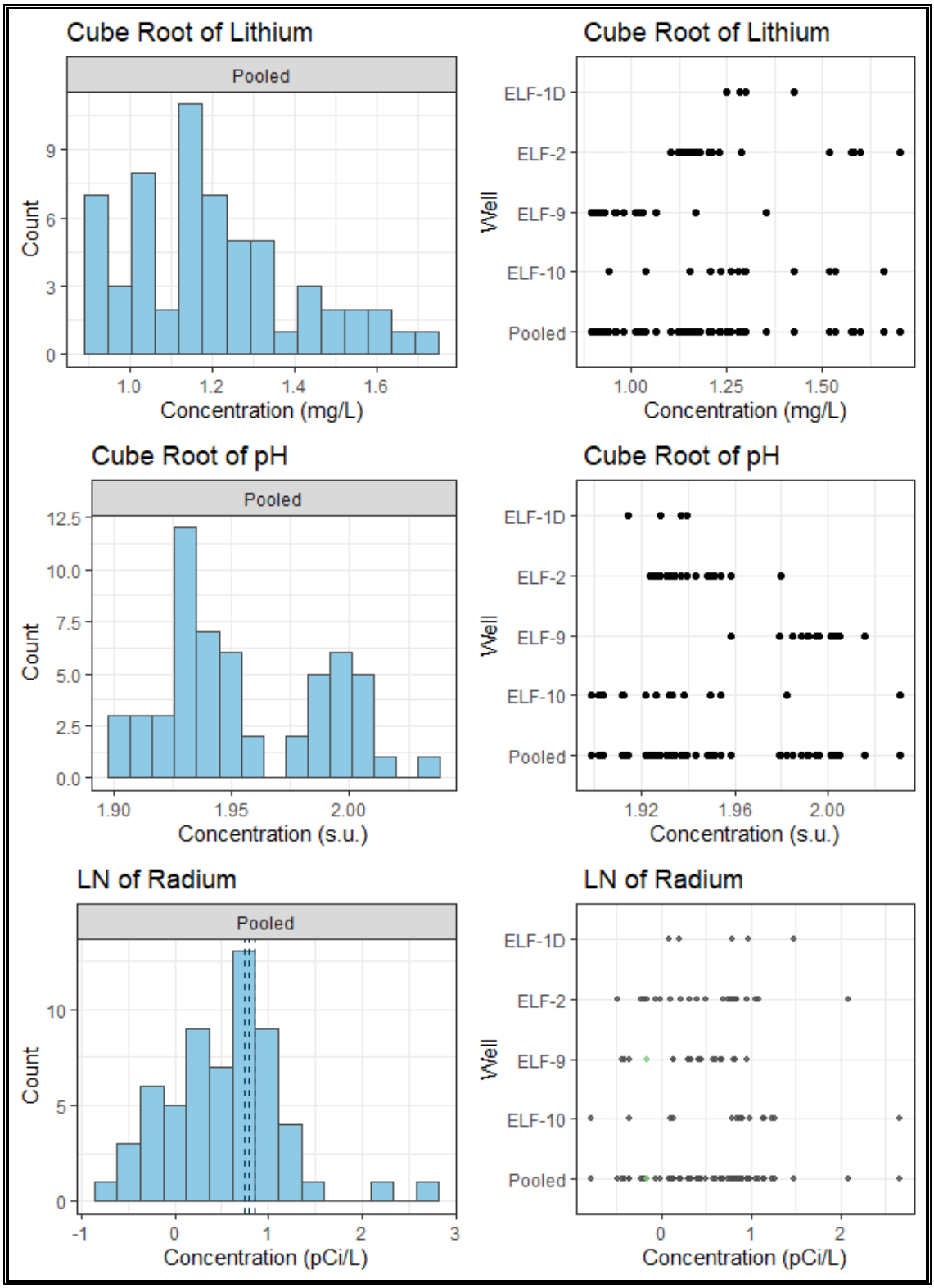

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

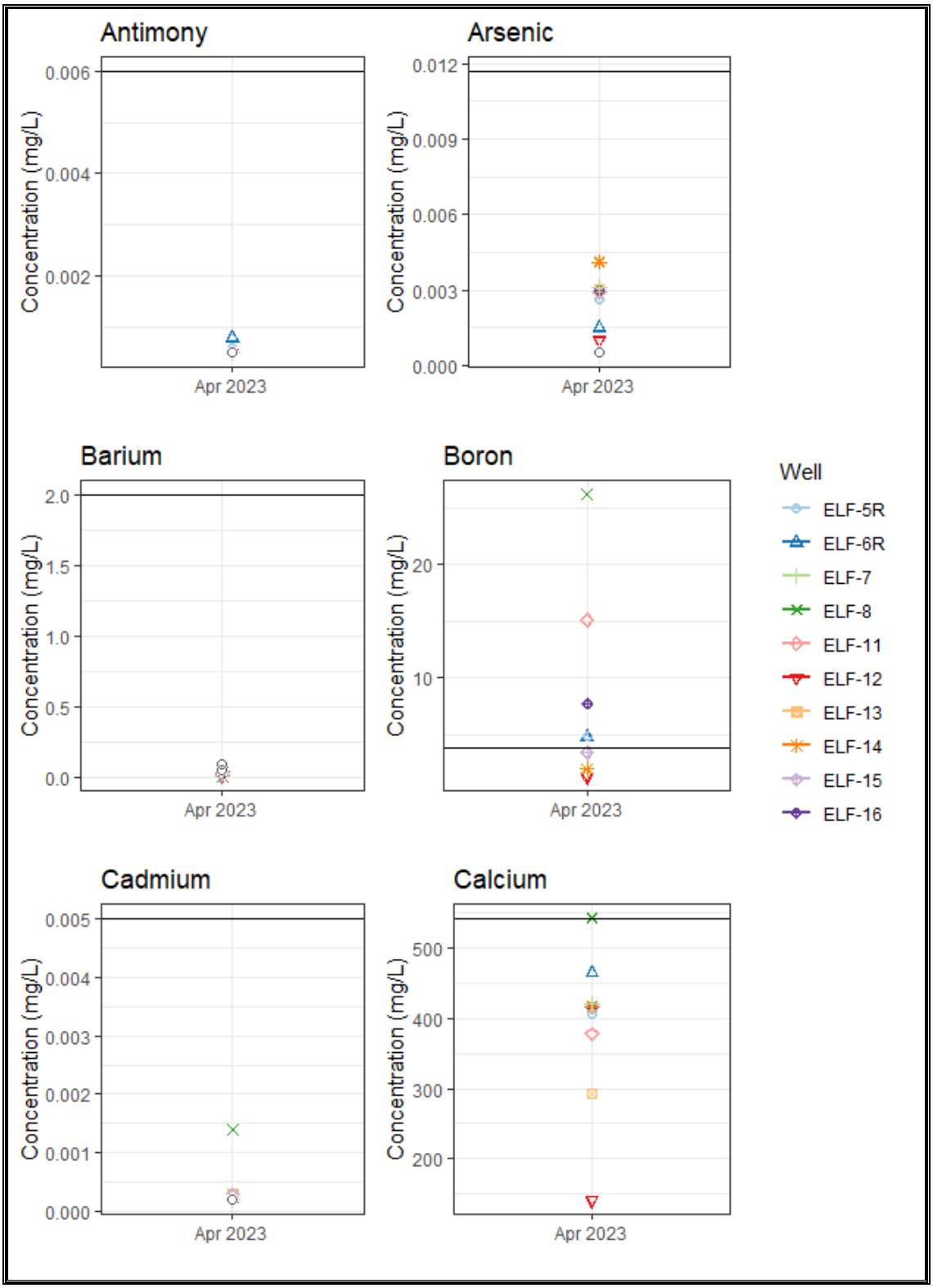

Figure C.4. Background upper tolerance limit plots for the CCR Landfill.

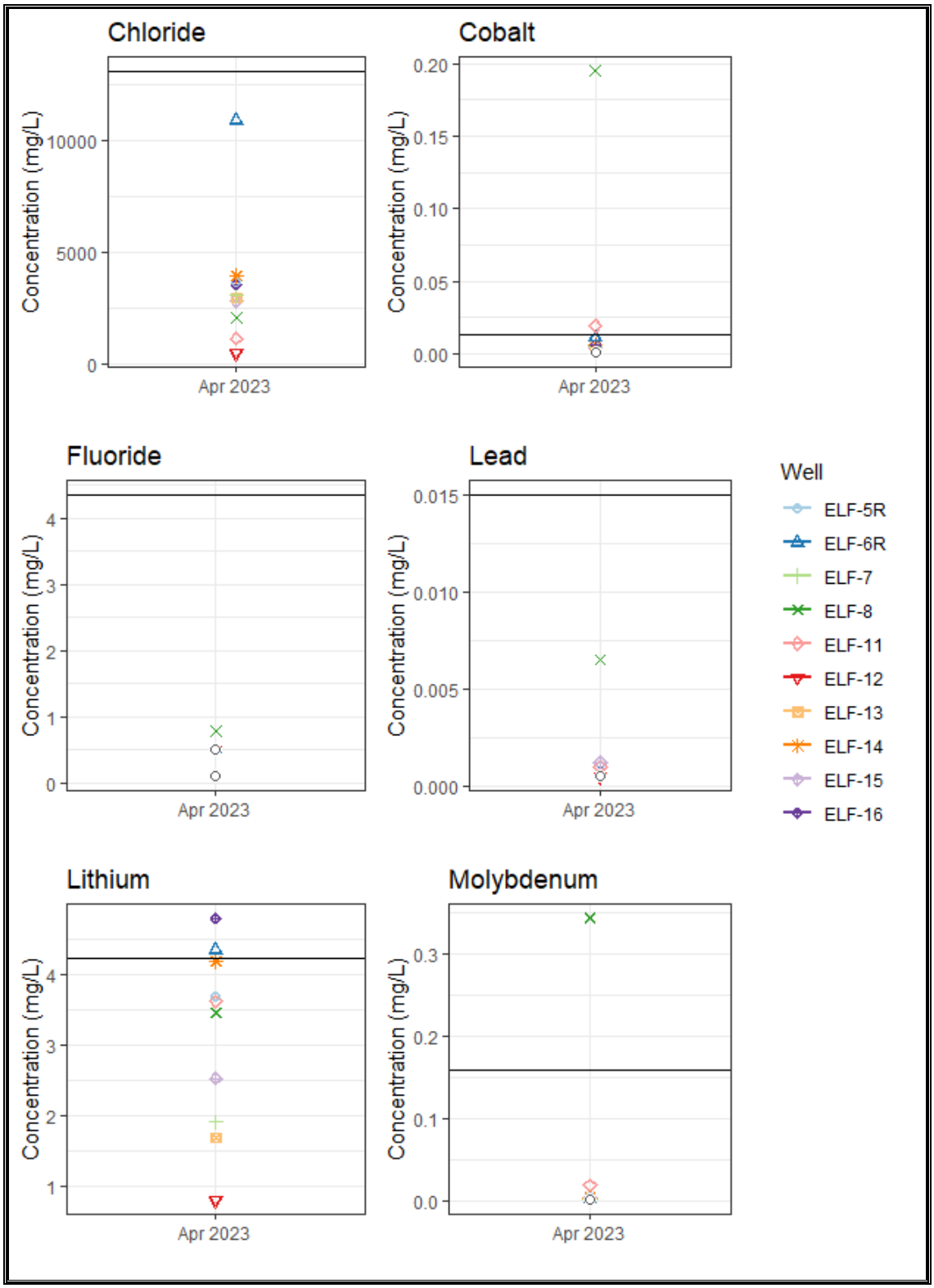

Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.

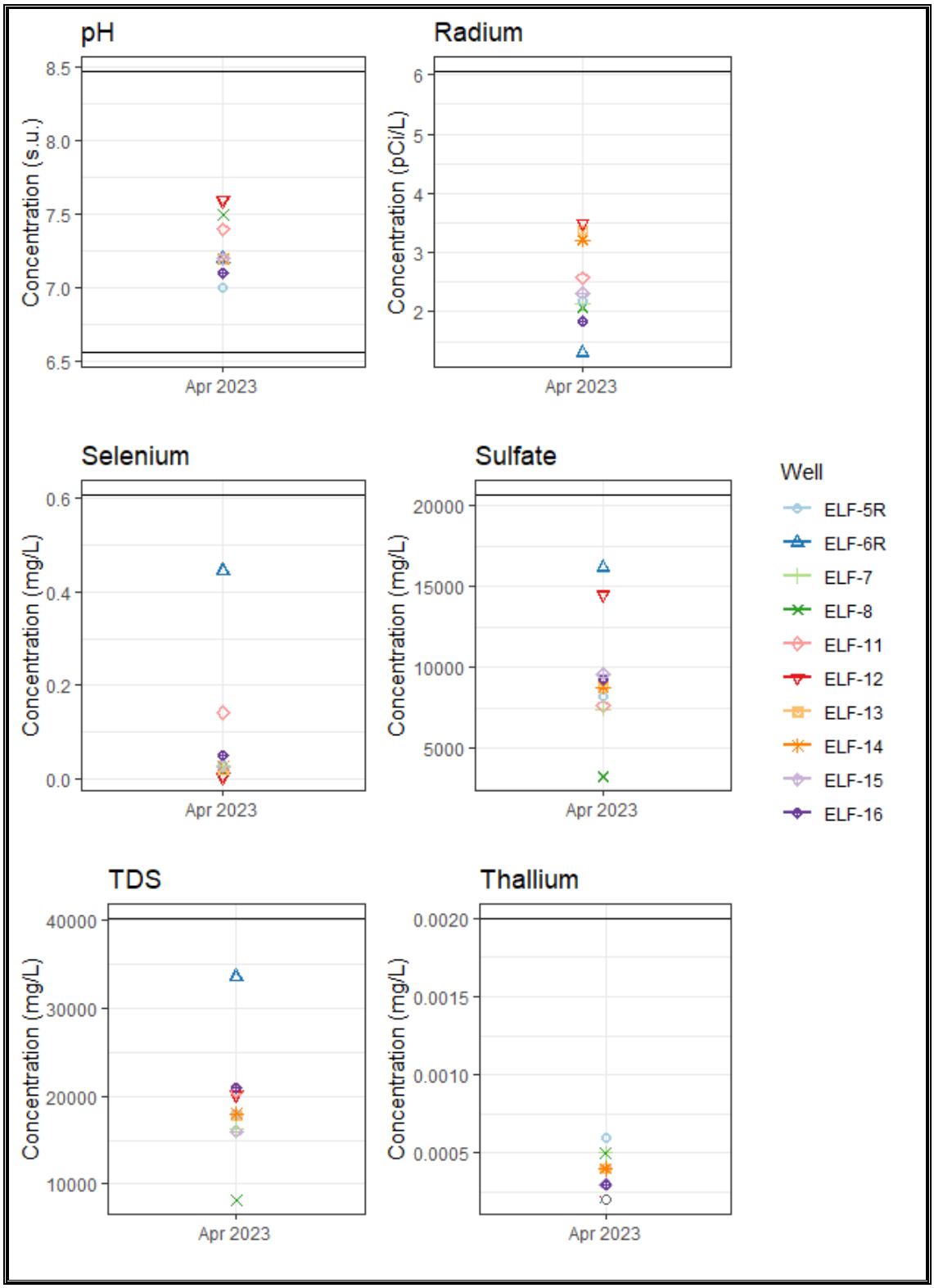

Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.

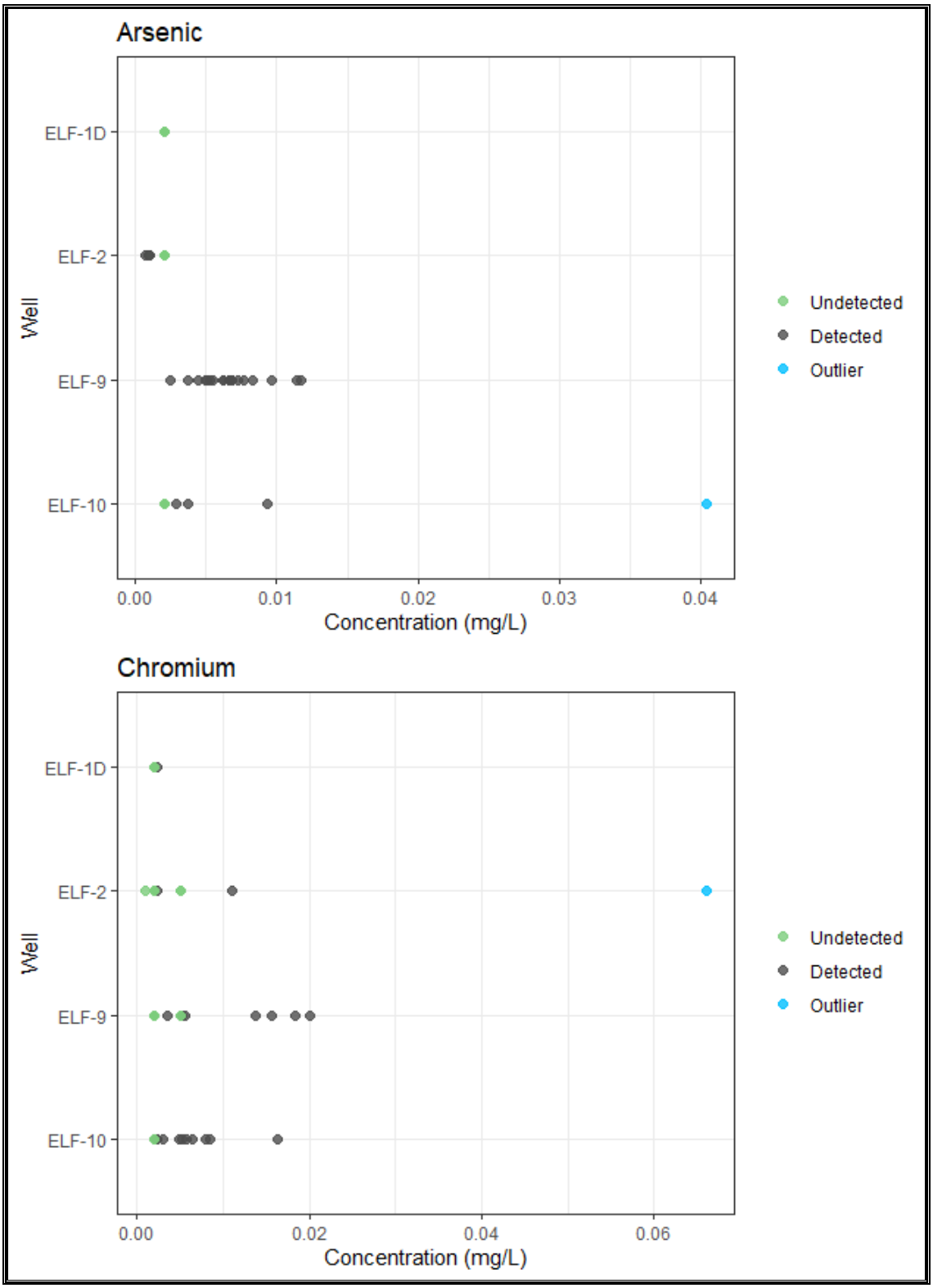

Figure C.5. Outlier plot for the Ash Landfill data.

Attachment D:

Field Data Sheets

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-1d
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	82.91
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample. We have checked recharge in the past, Very poor. 3.6 ' water. not able to collect water.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-1s
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	34.53
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample. 0.9 ft of water. very poor recharge.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-2
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	11:30
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	24.21
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,105	12.4	14,100	1.29	6.91	8	66.7
1,110	12.4	14,000	1.20	6.87	8	103
1,115	12.5	14,100	1.13	6.86	8	187
1,120	12.7	14,000	1.06	6.85	8	193
1,125	12.7	14,000	0.99	6.84	8	197

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Started to get more turbid at sampling. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-3
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	33.34
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample, 1.6' water. Very poor producer, takes > week to recharge.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-4
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	18:55
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	18.59
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,830	10.9	15,600	1.21	6.82	9	64.3
1,835	11.0	15,600	1.02	6.80	8.9	40.4
1,840	11.0	15,600	0.93	6.80	9	17.9
1,845	11.0	15,600	0.89	6.80	9	18.4
1,850	10.9	15,600	0.83	6.80	9	18

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-5R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	18:20
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	21.32
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,755	12.2	22,500	1.09	7.04	13.3	387
1,800	12.3	22,100	1.10	6.97	13.1	169
1,805	12.4	22,100	0.99	6.96	13.1	142
1,810	12.4	22,100	0.94	6.94	13.1	138
1,815	12.5	22,100	0.90	6.94	13.1	131

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-6R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	17:40
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	20.20
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,715	11.8	39,700	1.40	7.09	24.8	96.4
1,720	11.7	39,500	1.31	7.09	24.7	86.1
1,725	11.7	39,400	1.24	7.08	24.6	59.6
1,730	11.8	39,200	1.15	7.07	24.4	52.3
1,735	11.8	39,000	1.13	7.07	24.3	51.8

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-7
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	19:40
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	16.89
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,915	10.7	20,000	2.34	6.87	11.7	191
1,920	10.4	20,100	2.31	6.85	11.7	65.2
1,925	10.6	19,900	2.26	6.85	11.7	41.6
1,930	10.7	19,900	2.14	6.84	11.6	42.1
1,935	10.7	19,900	2.13	6.84	11.7	42

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-8
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	16:15
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	9.19
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,550	11.2	11,500	1.70	7.24	6.4	15.1
1,555	11.2	11,400	1.15	7.24	6.4	8.3
1,600	11.2	11,400	0.97	7.29	6.4	1.1
1,605	11.2	11,400	0.94	7.19	6.4	0
1,610	11.2	11,400	0.89	7.30	6.4	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 8 bottles - Dup included.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-9
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	09:50
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	22.85
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
915	11.1	14,900	1.33	7.63	8.3	36.8
920	11.2	14,400	1.07	7.62	8.3	29.1
925	11.2	14,100	0.99	7.64	8.1	30.6
930	11.2	14,000	0.95	7.63	7.9	0
935	11.0	13,600	0.92	7.62	7.5	0
940	11.2	12,600	1.01	7.48	7.1	0
945	11.2	12,400	1.06	7.46	6.9	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles w/sample and 4 bottles w/di water for field blank.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-10
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	50.56
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

1.44 water. From past experince, very poor recharge. No Sample.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-11
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 5, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:20
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	28.10
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,455	12.5	21,500	3.86	7.17	12.8	196
1,500	12.5	21,700	2.99	7.14	12.9	185
1,505	12.5	21,700	2.86	7.13	12.9	181
1,510	12.5	21,800	2.80	7.12	13	170
1,515	12.5	21,800	2.71	7.12	13	166

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-12
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	17:00
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	21.65
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,635	12.4	22,300	1.26	7.45	13.2	138
1,640	12.4	22,300	1.10	7.44	13.2	64
1,645	12.4	22,400	1.02	7.43	13.3	53
1,650	12.4	22,400	1.00	7.42	13.3	48.5
1,655	12.4	22,500	0.97	7.42	13.3	48.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles.

Water & Environmental TECHNOLOGIES

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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-13
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:45
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	4.78
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,525	9.5	21,200	0.99	6.95	12.4	0.9
1,530	9.5	21,200	1.02	6.93	12.4	0
1,535	9.5	21,100	1.03	6.92	12.4	0
1,540	9.5	21,100	1.02	6.92	12.4	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-14
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	14:30
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	6.78
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,410	9.9	23,500	1.43	7.12	13.9	72.9
1,415	9.8	23,500	1.22	7.12	13.9	54.3
1,420	9.7	23,500	1.26	7.13	13.9	54.1
1,425	9.7	23,500	1.21	7.12	13.9	53.5

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity Filled 4 bottles

Water & Environmental TECHNOLOGIES

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-15
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	15:10
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	7.94
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,445	10.5	21,800	1.36	7.03	12.8	17.1
1,450	10.5	21,800	1.20	6.98	12.9	64.2
1,455	10.6	21,800	1.21	6.96	12.8	42.5
1,500	10.6	21,800	1.12	6.96	12.9	19.6
1,505	10.6	21,800	1.13	6.95	12.9	22.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is Salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
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Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-16
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	12:15
Sampler(s) Initials	DV and BG	**Depth to Water (ft.)**	14.43
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,150	12.8	26,400	1.17	7.19	16	36.4
1,155	12.8	26,500	1.11	7.18	16	30.8
1,200	12.1	24,000	1.40	7.08	14.4	31
1,205	12.0	24,100	1.23	7.07	14.4	30.3
1,210	11.9	24,000	1.10	7.07	14.4	29.8

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity. Filled 4 bottles.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	2018.0284	**Sample ID**	ELF-17
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2023
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	Dv and BG	**Depth to Water (ft.)**	29.65
Field Conditions	Good		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Near Dry. No sample.

Attachment E:

Laboratory Analytical Reports

CHEMTECH-FORD
LABORATORIES

4/24/2023

Work Order: 23D0472
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

Pacificorp - Environmental Remediation
Project: Hunter Power Plant CCR
Project Manager: Brad Giles

Laboratory ID	Sample Name
23D0472-01	ELF-2
23D0472-02	ELF-4
23D0472-03	ELF-5R
23D0472-04	ELF-6R
23D0472-05	ELF-7
23D0472-06	ELF-8
23D0472-07	ELF-9
23D0472-08	ELF-11
23D0472-09	ELF-12
23D0472-10	ELF-13
23D0472-11	ELF-14
23D0472-12	ELF-15
23D0472-13	ELF-16
23D0472-14	Duplicate - (CCR)
23D0472-15	Field Blank - (CCR)

Work Order Report Narrative

Sample Preparation
All samples were prepared within method specified holding times, except as noted on the report. No preparation issues were noted.

Method Blanks
All blank values were within method acceptance criteria. No blank values exceeded the minimum reporting limit for any analysis in this work order.

Laboratory Control Samples
All laboratory control samples were within method acceptance criteria.

Method Spikes
All method spike recoveries were within method acceptance criteria, except as noted by qualifying flags.

Method Spike Duplicates
All method spike duplicates were within method acceptance criteria, except as noted by qualifying flags.

Corrective Actions
There are no corrective actions associated with this work order.

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **23D0472-01**
Date Sampled: **4/6/23 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	212	mg/L	5.00	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:46	SPH
Sulfate	8440	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	11900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.029	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	4/7/23	4/10/23	
Boron, Total	3.24	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	342	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	0.066	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0131	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0021	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.56	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0041	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0033	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **23D0472-02**
Date Sampled: **4/5/23 18:55**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2350	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.1	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:47	SPH
Sulfate	6200	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	12800	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.79	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	463	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0069	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.80	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0023	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0150	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **23D0472-03**
Date Sampled: **4/5/23 18:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3650	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.0	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:51	SPH
Sulfate	8190	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	17900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0006	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0026	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.017	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.75	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	407	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0006	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	3.69	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0323	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **23D0472-04**
Date Sampled: **4/5/23 17:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	10900	mg/L	500	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:51	SPH
Sulfate	16200	mg/L	500	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	33600	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0008	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	ND	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	4.74	mg/L	1.00	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	465	mg/L	4.0	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0113	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0007	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.35	mg/L	0.100	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0016	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.445	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **23D0472-05**
Date Sampled: **4/5/23 19:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3050	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:52	SPH
Sulfate	7420	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	16300	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0031	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.009	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.61	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	421	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0048	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.91	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0019	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0287	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **23D0472-06**
Date Sampled: **4/5/23 16:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2040	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Fluoride	0.787	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.5	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:52	SPH
Sulfate	3250	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	8160	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	0.011	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	26.2	mg/L	0.05	EPA 200.7	4/12/23	4/17/23	
Cadmium, Total	0.0014	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	543	mg/L	0.2	EPA 200.7	4/12/23	4/17/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Cobalt, Total	0.195	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	0.0065	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	3.46	mg/L	0.005	EPA 200.7	4/12/23	4/17/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.343	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	0.0175	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **23D0472-07**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	242	mg/L	5.00	EPA 300.0	4/10/23	4/10/23	
Fluoride	0.754	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.9	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:53	SPH
Sulfate	5730	mg/L	100	EPA 300.0	4/10/23	4/10/23	
Total Dissolved Solids (TDS)	9540	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0008	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0025	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.016	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.31	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	86.8	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.09	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0322	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0012	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **23D0472-08**
Date Sampled: **4/5/23 15:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	1120	mg/L	20.0	EPA 300.0	4/11/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/10/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:54	SPH
Sulfate	7610	mg/L	500	EPA 300.0	4/20/23	4/20/23	
Total Dissolved Solids (TDS)	20500	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.020	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	15.1	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	378	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0192	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	3.62	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0185	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.141	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **23D0472-09**
Date Sampled: **4/6/23 17:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	484	mg/L	5.00	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.6	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:54	SPH
Sulfate	14500	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	20200	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0010	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.013	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.25	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	141	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	0.808	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0046	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **23D0472-10**
Date Sampled: **4/6/23 15:45**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2950	mg/L	20.0	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.100	EPA 300.0	4/20/23	4/20/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:55	SPH
Sulfate	8750	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	17800	mg/L	100	SM 2540 C	4/20/23	4/20/23	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	ND	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	4/7/23	4/10/23	
Boron, Total	ND	mg/L	0.50	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	293	mg/L	2.0	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0043	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	1.69	mg/L	0.050	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0009	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0188	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **23D0472-11**
Date Sampled: **4/6/23 14:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3930	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:56	SPH
Sulfate	8780	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	18000	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0041	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	1.93	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	417	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0062	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.19	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0034	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0275	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0004	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **23D0472-12**
Date Sampled: **4/6/23 15:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2820	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/7/23 13:52	4/7/23 14:56	SPH
Sulfate	9590	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	16000	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0029	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.024	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	3.38	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	416	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0042	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	0.0012	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	2.53	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0025	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0256	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **23D0472-13**
Date Sampled: **4/6/23 12:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3540	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.1	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:04	SPH
Sulfate	9270	mg/L	100	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	20900	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	0.0005	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Arsenic, Total	0.0030	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Boron, Total	7.74	mg/L	0.05	EPA 200.7	4/7/23	4/10/23	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	
Calcium, Total	414	mg/L	0.2	EPA 200.7	4/7/23	4/10/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Cobalt, Total	0.0063	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Lithium, Total	4.80	mg/L	0.005	EPA 200.7	4/7/23	4/10/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.0038	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Selenium, Total	0.0495	mg/L	0.0005	EPA 200.8	4/7/23	4/10/23	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/7/23	4/10/23	

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**
Matrix: **Water**
Lab ID: **23D0472-14**
Date Sampled: **4/5/23 0:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2690	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Fluoride	0.811	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:05	SPH
Sulfate	3920	mg/L	500	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	8360	mg/L	100	SM 2540 C	4/7/23	4/7/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	0.0026	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	26.2	mg/L	0.05	EPA 200.7	4/13/23	4/14/23	
Cadmium, Total	0.0016	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	469	mg/L	0.2	EPA 200.7	4/13/23	4/14/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Cobalt, Total	0.197	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	0.0060	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	5.25	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	0.355	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	0.0174	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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PO#:
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Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **23D0472-15**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	ND	mg/L	1.00	EPA 300.0	4/10/23	4/11/23	
Fluoride	ND	mg/L	0.500	EPA 300.0	4/10/23	4/11/23	
pH	5.7	pH Units	0.1	SM 4500 H-B	4/7/23 13:53	4/7/23 15:11	SPH
Sulfate	ND	mg/L	1.00	EPA 300.0	4/10/23	4/11/23	
Total Dissolved Solids (TDS)	14	mg/L	10	SM 2540 C	4/10/23	4/10/23	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Barium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Boron, Total	ND	mg/L	0.05	EPA 200.7	4/13/23	4/14/23	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	
Calcium, Total	ND	mg/L	0.2	EPA 200.7	4/13/23	4/14/23	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Lithium, Total	ND	mg/L	0.005	EPA 200.7	4/13/23	4/14/23	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	4/11/23	4/11/23	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Selenium, Total	ND	mg/L	0.0005	EPA 200.8	4/10/23	4/10/23	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/10/23	4/10/23	

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 4/24/2023
Project Name: **Hunter Power Plant CCR**

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).
1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

APH-R = This sample was originally analyzed within the EPA-recommended holding time. The reported value was obtained from a confirmatory re-analysis that was performed outside of that holding time.
SPH = Sample submitted past method specified holding time.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0472 RADS ON 23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
	1. ELF-1D	-	-	W		4	x	x	x	x	x	x	x	x				x									
01	2. ELF-2	4/6/2023	11:30	W		4	x	x	x	x	x	x	x	x				x									
	3. ELF-3	-	-	W		4	x	x	x	x	x	x	x	x				x									
02	4. ELF-4	4/5/2023	18:55	W		4	x	x	x	x	x	x	x	x				x									
03	5. ELF-5R	4/5/2023	18:20	W		4	x	x	x	x	x	x	x	x				x									
04	6. ELF-6R	4/5/2023	17:40	W		4	x	x	x	x	x	x	x	x				x									
05	7. ELF-7	4/5/2023	19:40	W		4	x	x	x	x	x	x	x	x				x									
06	8. ELF-8	4/5/2023	16:15	W		4	x	x	x	x	x	x	x	x				x									
07	9. ELF-9	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x									
	10. ELF-10	-	-	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
	4-7-23 12:31		4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [sign	

AG AQ 1296 M 1274

Sample Receipt Conditions:
( ) Custody Seals Present
( ) Containers Intact
( ) COC and Labels Match
( ) Received on Ice
( ) Correct Containers
( ) COC Included
( ) COC Complete
( ) Sufficient Sample Volume
( ) Headspace Present (VOC)
( ) Temperature Blank
( ) Received within Hold
Checked by:

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orney's

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CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0472

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/5/2023	15:20	W		4	x	x	x	x	x	x	x	x				x									
09	2. ELF-12	4/6/2023	17:00	W		4	x	x	x	x	x	x	x	x				x									
10	3. ELF-13	4/6/2023	15:45	W		4	x	x	x	x	x	x	x	x				x									
11	4. ELF-14	4/6/2023	14:30	W		4	x	x	x	x	x	x	x	x				x									
12	5. ELF-15	4/6/2023	15:10	W		4	x	x	x	x	x	x	x	x				x									
13	6. ELF-16	4/6/2023	12:15	W		4	x	x	x	x	x	x	x	x				x									
	7. ELF-17	-	-	W		4	x	x	x	x	x	x	x	x				x									
	8.																										
14	9. Duplicate - (CCR)	4/5/2023	-	W		4	x	x	x	x	x	x	x	x				x									
1415	10. Field Blank - (CCR)	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
	4-7-23 12:31		4/7/23 1231
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Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.7									
QC Sample ID: BXD0255-BLK1	Batch: BXD0255								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0256-BLK1	Batch: BXD0256								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0462-BLK1	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BXD0533-BLK1	Batch: BXD0533								
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
LCS - EPA 200.7									
QC Sample ID: BXD0255-BS1	Batch: BXD0255								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	99.7		85 - 115		0.199		0.200	0.005	1.00
Boron, Total	98.1		85 - 115		0.49		0.500	0.05	1.00
Calcium, Total	99.6		85 - 115		10.2		10.2	0.2	1.00
Chromium, Total	105		85 - 115		0.210		0.200	0.005	1.00
Lithium, Total	101		85 - 115		0.203		0.200	0.005	1.00
QC Sample ID: BXD0256-BS1	Batch: BXD0256								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101		85 - 115		0.202		0.200	0.005	1.00
Boron, Total	99.6		85 - 115		0.50		0.500	0.05	1.00
Calcium, Total	101		85 - 115		10.3		10.2	0.2	1.00
Chromium, Total	106		85 - 115		0.212		0.200	0.005	1.00
Lithium, Total	99.3		85 - 115		0.199		0.200	0.005	1.00
QC Sample ID: BXD0462-BS1	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	92.6		85 - 115		0.185		0.200	0.005	1.00
Boron, Total	92.6		85 - 115		0.46		0.500	0.05	1.00
Calcium, Total	95.7		85 - 115		9.8		10.2	0.2	1.00
Chromium, Total	95.7		85 - 115		0.191		0.200	0.005	1.00
Lithium, Total	96.2		85 - 115		0.192		0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 200.7 (cont.)									
QC Sample ID: BXD0462-BS2	Batch: BXD0462								
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total			85 - 115		ND			0.005	1.00
Boron, Total			85 - 115		ND			0.05	1.00
Calcium, Total			85 - 115		0.01			0.2	1.00
Chromium, Total			85 - 115		ND			0.005	1.00
Lithium, Total			85 - 115		ND			0.005	1.00
QC Sample ID: BXD0533-BS1	Batch: BXD0533								
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	120		85 - 115		0.241		0.200	0.005	1.00
QM-11 - The Laboratory Control Sample recovery was outside acceptance limits. The analytical batch was accepted based on the recovery of the Method Spike.									
Boron, Total	106		85 - 115		0.53		0.500	0.05	1.00
Calcium, Total	119		85 - 115		12.1		10.2	0.2	1.00
QM-11 - The Laboratory Control Sample recovery was outside acceptance limits. The analytical batch was accepted based on the recovery of the Method Spike.									
Chromium, Total	100		85 - 115		0.200		0.200	0.005	1.00
Lithium, Total	101		85 - 115		0.202		0.200	0.005	1.00
Matrix Spike - EPA 200.7									
QC Sample ID: BXD0255-MS1	Batch: BXD0255		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	74.2		70 - 130		0.155	0.007	0.200	0.005	1.00
Boron, Total	110		70 - 130		1.00	0.45	0.500	0.05	1.00
Calcium, Total	103		70 - 130		303	293	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	96.6		70 - 130		0.194	0.001	0.200	0.005	1.00
Lithium, Total	163		70 - 130		2.01	1.69	0.200	0.005	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
QC Sample ID: BXD0255-MS2	Batch: BXD0255		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	99.4		70 - 130		0.342	0.143	0.200	0.005	1.00
Boron, Total	104		70 - 130		0.74	0.22	0.500	0.05	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Calcium, Total	103		70 - 130		31.1	20.5	10.2	0.2	1.00
Chromium, Total	104		70 - 130		0.209	0.001	0.200	0.005	1.00
Lithium, Total	99.9		70 - 130		0.278	0.078	0.200	0.005	1.00
QC Sample ID: BXD0256-MS1	Batch: BXD0256		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	102		70 - 130		0.278	0.073	0.200	0.050	10.00
Boron, Total	117		70 - 130		0.58	ND	0.500	0.50	10.00
Calcium, Total	129		70 - 130		77.5	64.4	10.2	2.0	10.00
Chromium, Total	108		70 - 130		0.216	ND	0.200	0.050	10.00
Lithium, Total	91.0		70 - 130		0.182	ND	0.200	0.050	10.00
QC Sample ID: BXD0256-MS2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101		70 - 130		0.230	0.029	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 200.7 (cont.)									
QC Sample ID: BXD0256-MS2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Boron, Total	92.2		70 - 130		3.70	3.24	0.500	0.05	1.00
Calcium, Total	314		70 - 130		374	342	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	113		70 - 130		0.291	0.066	0.200	0.005	1.00
Lithium, Total	107		70 - 130		1.78	1.56	0.200	0.005	1.00
QC Sample ID: BXD0462-MS1	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	97.9		70 - 130		0.220	0.024	0.200	0.005	1.00
Boron, Total	101		70 - 130		0.50	0.03	0.500	0.05	1.00
Calcium, Total	109		70 - 130		32.6	21.5	10.2	0.2	1.00
Chromium, Total	101		70 - 130		0.207	0.006	0.200	0.005	1.00
Lithium, Total	104		70 - 130		0.213	0.006	0.200	0.005	1.00
QC Sample ID: BXD0462-MS2	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	93.6		70 - 130		0.208	0.021	0.200	0.005	1.00
Boron, Total	91.8		70 - 130		1.06	0.60	0.500	0.05	1.00
Calcium, Total	95.7		70 - 130		33.4	23.7	10.2	0.2	1.00
Chromium, Total	95.8		70 - 130		0.203	0.011	0.200	0.005	1.00
Lithium, Total	99.2		70 - 130		0.442	0.244	0.200	0.005	1.00
QC Sample ID: BXD0533-MS1	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	90.5		70 - 130		0.205	0.024	0.200	0.005	1.00
Boron, Total	95.8		70 - 130		0.48	ND	0.500	0.05	1.00
Calcium, Total	83.8		70 - 130		52.6	44.1	10.2	0.2	1.00
Chromium, Total	99.8		70 - 130		0.200	0.0008	0.200	0.005	1.00
Lithium, Total	121		70 - 130		0.251	0.008	0.200	0.005	1.00
QC Sample ID: BXD0533-MS2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	104		70 - 130		0.209	ND	0.200	0.005	1.00
Boron, Total	102		70 - 130		0.51	ND	0.500	0.05	1.00
Calcium, Total	103		70 - 130		10.5	ND	10.2	0.2	1.00
Chromium, Total	93.6		70 - 130		0.187	ND	0.200	0.005	1.00
Lithium, Total	92.0		70 - 130		0.184	ND	0.200	0.005	1.00
Matrix Spike Dup - EPA 200.7									
QC Sample ID: BXD0255-MSD1	Batch: BXD0255		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	77.2	3.79	70 - 130	20	0.161	0.007	0.200	0.005	1.00
Boron, Total	115	2.51	70 - 130	20	1.02	0.45	0.500	0.05	1.00
Calcium, Total	347	7.90	70 - 130	20	328	293	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	100	3.34	70 - 130	20	0.201	0.001	0.200	0.005	1.00
Lithium, Total	190	2.60	70 - 130	20	2.07	1.69	0.200	0.005	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0255-MSD2	Batch: BXD0255		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	98.8	0.352	70 - 130	20	0.340	0.143	0.200	0.005	1.00
Boron, Total	102	0.811	70 - 130	20	0.74	0.22	0.500	0.05	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Calcium, Total	103	0.277	70 - 130	20	31.0	20.5	10.2	0.2	1.00
Chromium, Total	103	0.770	70 - 130	20	0.207	0.001	0.200	0.005	1.00
Lithium, Total	100	0.359	70 - 130	20	0.279	0.078	0.200	0.005	1.00
QC Sample ID: BXD0256-MSD1	Batch: BXD0256		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	98.9	2.55	70 - 130	20	0.271	0.073	0.200	0.050	10.00
Boron, Total	112	4.20	70 - 130	20	0.56	ND	0.500	0.50	10.00
Calcium, Total	109	2.56	70 - 130	20	75.6	64.4	10.2	2.0	10.00
Chromium, Total	106	2.34	70 - 130	20	0.211	ND	0.200	0.050	10.00
Lithium, Total	87.5	3.92	70 - 130	20	0.175	ND	0.200	0.050	10.00
QC Sample ID: BXD0256-MSD2	Batch: BXD0256		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Barium, Total	101	0.390	70 - 130	20	0.231	0.029	0.200	0.005	1.00
Boron, Total	110	2.35	70 - 130	20	3.79	3.24	0.500	0.05	1.00
Calcium, Total	359	1.23	70 - 130	20	379	342	10.2	0.2	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Chromium, Total	116	2.28	70 - 130	20	0.298	0.066	0.200	0.005	1.00
Lithium, Total	118	1.19	70 - 130	20	1.80	1.56	0.200	0.005	1.00
QC Sample ID: BXD0462-MSD1	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	94.8	2.87	70 - 130	20	0.213	0.024	0.200	0.005	1.00
Boron, Total	99.2	1.56	70 - 130	20	0.50	0.03	0.500	0.05	1.00
Calcium, Total	98.3	3.37	70 - 130	20	31.5	21.5	10.2	0.2	1.00
Chromium, Total	97.8	2.74	70 - 130	20	0.202	0.006	0.200	0.005	1.00
Lithium, Total	99.4	3.88	70 - 130	20	0.205	0.006	0.200	0.005	1.00
QC Sample ID: BXD0462-MSD2	Batch: BXD0462		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/12/2023	Date Analyzed: 04/13/2023								
Barium, Total	95.5	1.86	70 - 130	20	0.212	0.021	0.200	0.005	1.00
Boron, Total	94.9	1.47	70 - 130	20	1.08	0.60	0.500	0.05	1.00
Calcium, Total	101	1.63	70 - 130	20	34.0	23.7	10.2	0.2	1.00
Chromium, Total	98.4	2.58	70 - 130	20	0.208	0.011	0.200	0.005	1.00
Lithium, Total	103	1.55	70 - 130	20	0.449	0.244	0.200	0.005	1.00
QC Sample ID: BXD0533-MSD1	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	96.0	5.23	70 - 130	20	0.216	0.024	0.200	0.005	1.00
Boron, Total	101	5.17	70 - 130	20	0.50	ND	0.500	0.05	1.00
Calcium, Total	95.6	2.26	70 - 130	20	53.8	44.1	10.2	0.2	1.00
Chromium, Total	98.1	1.66	70 - 130	20	0.197	0.0008	0.200	0.005	1.00
Lithium, Total	119	1.89	70 - 130	20	0.246	0.008	0.200	0.005	1.00
QC Sample ID: BXD0533-MSD2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Barium, Total	88.6	16.4	70 - 130	20	0.177	ND	0.200	0.005	1.00

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0533-MSD2	Batch: BXD0533		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2023	Date Analyzed: 04/14/2023								
Boron, Total	87.6	14.9	70 - 130	20	0.44	ND	0.500	0.05	1.00
Calcium, Total	87.8	16.0	70 - 130	20	9.0	ND	10.2	0.2	1.00
Chromium, Total	94.6	1.06	70 - 130	20	0.189	ND	0.200	0.005	1.00
Lithium, Total	93.0	1.08	70 - 130	20	0.186	ND	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.8									
QC Sample ID: BXD0258-BLK1	Batch: BXD0258								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total					ND			0.0005	1.00
Arsenic, Total					ND			0.0005	1.00
Beryllium, Total					ND			0.0005	1.00
Cadmium, Total					ND			0.0002	1.00
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BXD0282-BLK1	Batch: BXD0282								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total					ND			0.0005	1.00
Arsenic, Total					ND			0.0005	1.00
Beryllium, Total					ND			0.0005	1.00
Cadmium, Total					ND			0.0002	1.00
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
LCS - EPA 200.8									
QC Sample ID: BXD0258-BS1	Batch: BXD0258								
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	105		85 - 115		0.042		0.0400	0.0005	1.00
Arsenic, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	104		85 - 115		0.042		0.0400	0.0005	1.00
Cadmium, Total	103		85 - 115		0.041		0.0400	0.0002	1.00
Cobalt, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Lead, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Molybdenum, Total	102		85 - 115		0.041		0.0400	0.0005	1.00
Selenium, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.042		0.0400	0.0002	1.00
QC Sample ID: BXD0282-BS1	Batch: BXD0282								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	99.4		85 - 115		0.040		0.0400	0.0005	1.00
Arsenic, Total	99.1		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Cadmium, Total	96.6		85 - 115		0.039		0.0400	0.0002	1.00
Cobalt, Total	96.8		85 - 115		0.039		0.0400	0.0005	1.00
Lead, Total	96.3		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	98.8		85 - 115		0.040		0.0400	0.0005	1.00
Selenium, Total	98.3		85 - 115		0.039		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.042		0.0400	0.0002	1.00
Matrix Spike - EPA 200.8									
QC Sample ID: BXD0258-MS1	Batch: BXD0258		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	94.5		70 - 130		0.038	0.0003	0.0400	0.0005	1.00
Arsenic, Total	92.2		70 - 130		0.038	0.001	0.0400	0.0005	1.00
Beryllium, Total	96.3		70 - 130		0.039	ND	0.0400	0.0050	10.00

Matrix Spike - EPA 200.8 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0258-MS1	Batch: BXD0258		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Cadmium, Total	99.0		70 - 130		0.040	0.0002	0.0400	0.0002	1.00
Cobalt, Total	97.6		70 - 130		0.052	0.013	0.0400	0.0005	1.00
Lead, Total	94.6		70 - 130		0.040	0.002	0.0400	0.0005	1.00
Molybdenum, Total	106		70 - 130		0.047	0.004	0.0400	0.0005	1.00
Selenium, Total	94.1		70 - 130		0.041	0.003	0.0400	0.0005	1.00
Thallium, Total	97.9		70 - 130		0.039	0.0002	0.0400	0.0002	1.00
QC Sample ID: BXD0258-MS2	Batch: BXD0258		QC Source Sample: 23D0472-10						
Date Prepared: 04/07/2023	Date Analyzed: 04/10/2023								
Antimony, Total	106		70 - 130		0.043	0.0004	0.0400	0.0005	1.00
Arsenic, Total	93.6		70 - 130		0.040	0.003	0.0400	0.0005	1.00
Beryllium, Total	91.8		70 - 130		0.037	ND	0.0400	0.0050	10.00
Cadmium, Total	96.4		70 - 130		0.039	0.0003	0.0400	0.0002	1.00
Cobalt, Total	95.5		70 - 130		0.042	0.004	0.0400	0.0005	1.00
Lead, Total	94.8		70 - 130		0.038	0.0001	0.0400	0.0005	1.00
Molybdenum, Total	104		70 - 130		0.043	0.0009	0.0400	0.0005	1.00
Selenium, Total	94.3		70 - 130		0.056	0.019	0.0400	0.0005	1.00
Thallium, Total	98.5		70 - 130		0.040	0.0004	0.0400	0.0002	1.00
QC Sample ID: BXD0282-MS1	Batch: BXD0282		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	104		70 - 130		0.042	0.0001	0.0400	0.0005	1.00
Arsenic, Total	105		70 - 130		0.043	0.0006	0.0400	0.0005	1.00
Beryllium, Total	105		70 - 130		0.042	ND	0.0400	0.0005	1.00
Cadmium, Total	99.0		70 - 130		0.040	ND	0.0400	0.0002	1.00
Cobalt, Total	96.2		70 - 130		0.039	0.0002	0.0400	0.0005	1.00
Lead, Total	94.8		70 - 130		0.038	0.0001	0.0400	0.0005	1.00
Molybdenum, Total	105		70 - 130		0.043	0.001	0.0400	0.0005	1.00
Selenium, Total	108		70 - 130		0.045	0.001	0.0400	0.0005	1.00
Thallium, Total	103		70 - 130		0.041	ND	0.0400	0.0002	1.00
QC Sample ID: BXD0282-MS2	Batch: BXD0282		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Antimony, Total	99.9		70 - 130		0.047	0.007	0.0400	0.0005	1.00
Arsenic, Total	99.4		70 - 130		0.067	0.027	0.0400	0.0005	1.00
Beryllium, Total	102		70 - 130		0.041	ND	0.0400	0.0005	1.00
Cadmium, Total	95.1		70 - 130		0.039	0.001	0.0400	0.0002	1.00
Cobalt, Total	94.2		70 - 130		0.038	0.0004	0.0400	0.0005	1.00
Lead, Total	92.6		70 - 130		0.040	0.002	0.0400	0.0005	1.00
Molybdenum, Total	101		70 - 130		0.044	0.003	0.0400	0.0005	1.00
Selenium, Total	101		70 - 130		0.042	0.002	0.0400	0.0005	1.00
Thallium, Total	101		70 - 130		0.042	0.002	0.0400	0.0002	1.00

QC Report for Work Order (WO) - 23D0472

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 245.1									
QC Sample ID: BXD0353-BLK1	Batch: BXD0353								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total					ND			0.00015	1.00
LCS - EPA 245.1									
QC Sample ID: BXD0353-BS1	Batch: BXD0353								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	105		85 - 115		0.00526		0.00500	0.00015	1.00
Matrix Spike - EPA 245.1									
QC Sample ID: BXD0353-MS1	Batch: BXD0353		QC Source Sample: 23D0472-01						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	104		75 - 125		0.00521	ND	0.00500	0.00015	1.00
Matrix Spike Dup - EPA 245.1									
QC Sample ID: BXD0353-MSD1	Batch: BXD0353		QC Source Sample: 23D0472-01						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Mercury, Total	100	3.71	75 - 125	20	0.00502	ND	0.00500	0.00015	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 300.0									
QC Sample ID: BXD0289-BLK1	Batch: BXD0289								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BXD0313-BLK1	Batch: BXD0313								
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BXD0346-BLK1	Batch: BXD0346								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride					ND			1.00	1.00
QC Sample ID: BXD0969-BLK1	Batch: BXD0969								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
LCS - EPA 300.0									
QC Sample ID: BXD0289-BS1	Batch: BXD0289								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	96.9		90 - 110		48.4		50.0	1.00	1.00
Fluoride	96.3		90 - 110		4.82		5.00	0.100	1.00
Sulfate	95.9		90 - 110		48.0		50.0	1.00	1.00
QC Sample ID: BXD0313-BS1	Batch: BXD0313								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	96.7		90 - 110		48.3		50.0	1.00	1.00
Fluoride	98.8		90 - 110		4.94		5.00	0.100	1.00
Sulfate	97.0		90 - 110		48.5		50.0	1.00	1.00
QC Sample ID: BXD0346-BS1	Batch: BXD0346								
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	98.2		90 - 110		49.1		50.0	1.00	1.00
QC Sample ID: BXD0969-BS1	Batch: BXD0969								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	102		90 - 110		5.08		5.00	0.100	1.00
Sulfate	101		90 - 110		50.6		50.0	1.00	1.00
Matrix Spike - EPA 300.0									
QC Sample ID: BXD0289-MS1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	93.4		80 - 120		1150	212	1000	110	1.00
Fluoride	96.9		80 - 120		96.9	ND	100	11.0	1.00
Sulfate	50.3		80 - 120		8940	8440	1000	110	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0289-MS2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.3		80 - 120		126	33.9	100	11.0	1.00
Fluoride	97.4		80 - 120		9.74	ND	10.0	1.10	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 300.0 (cont.)									
QC Sample ID: BXD0289-MS2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Sulfate	88.2		80 - 120		146	57.8	100	11.0	1.00
QC Sample ID: BXD0313-MS1	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	186		80 - 120		18000	16200	1000	110	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
Fluoride	83.6		80 - 120		83.6	ND	100	11.0	1.00
Sulfate	104		80 - 120		3180	2130	1000	110	1.00
QC Sample ID: BXD0313-MS2	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	76.4		80 - 120		834	453	500	55.0	1.00
QM-010 - The MS recovery was outside acceptance limits but passed Duplicate Spike acceptance limits. The batch was accepted based on the acceptability of the MSD as the batch Spike.									
Fluoride	100		80 - 120		50.1	ND	50.0	5.50	1.00
Sulfate	7.36		80 - 120		4750	4710	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MS1	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	89.6		80 - 120		1350	453	1000	110	1.00
QC Sample ID: BXD0346-MS2	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	88.9		80 - 120		27900	19000	10000	1100	1.00
QC Sample ID: BXD0346-MS3	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	12.7		80 - 120		21100	21000	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MS4	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	-162		80 - 120		16700	17600	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0969-MS1	Batch: BXD0969		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	97.3		80 - 120		1.05	0.076	1.00	0.110	1.00
Sulfate	113		80 - 120		104	93.0	10.0	1.10	1.00
Matrix Spike Dup - EPA 300.0									
QC Sample ID: BXD0289-MSD1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.3	0.912	80 - 120	20	1140	212	1000	110	1.00
Fluoride	95.8	1.16	80 - 120	20	95.8	ND	100	11.0	1.00
Sulfate	44.6	0.644	80 - 120	20	8880	8440	1000	110	1.00

Matrix Spike Dup - EPA 300.0 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BXD0289-MSD1	Batch: BXD0289		QC Source Sample: 23D0472-01						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0289-MSD2	Batch: BXD0289		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Chloride	92.4	0.113	80 - 120	20	126	33.9	100	11.0	1.00
Fluoride	99.3	1.99	80 - 120	20	9.93	ND	10.0	1.10	1.00
Sulfate	88.7	0.312	80 - 120	20	146	57.8	100	11.0	1.00
QC Sample ID: BXD0313-MSD1	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	209	1.30	80 - 120	20	18200	16200	1000	110	1.00
Fluoride	93.7		80 - 120	20	93.7	ND	100	11.0	1.00
Sulfate	104	0.111	80 - 120	20	3170	2130	1000	110	1.00
QC Sample ID: BXD0313-MSD2	Batch: BXD0313		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/10/2023	Date Analyzed: 04/11/2023								
Chloride	85.0	5.04	80 - 120	20	878	453	500	55.0	1.00
Fluoride	98.5	1.73	80 - 120	20	49.2	ND	50.0	5.50	1.00
Sulfate	117	10.9	80 - 120	20	5290	4710	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MSD1	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	90.0	0.277	80 - 120	20	1350	453	1000	110	1.00
QC Sample ID: BXD0346-MSD2	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	82.7	2.28	80 - 120	20	27200	19000	10000	1100	1.00
QC Sample ID: BXD0346-MSD3	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	16.9	0.101	80 - 120	20	21100	21000	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0346-MSD4	Batch: BXD0346		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/11/2023	Date Analyzed: 04/11/2023								
Chloride	-161	0.0333	80 - 120	20	16800	17600	500	55.0	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BXD0969-MSD1	Batch: BXD0969		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Fluoride	99.9	2.41	80 - 120	20	1.07	0.076	1.00	0.110	1.00
Sulfate	114	0.0942	80 - 120	20	104	93.0	10.0	1.10	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2540 C									
QC Sample ID: BXD0259-BLK1	Batch: BXD0259								
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BXD0292-BLK1	Batch: BXD0292								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BXD0850-BLK1	Batch: BXD0850								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)					ND			10	1.00
Duplicate - SM 2540 C									
QC Sample ID: BXD0259-DUP1	Batch: BXD0259	QC Source Sample: 23D0472-01							
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	6			10	11200	11900		100	1.00
QC Sample ID: BXD0259-DUP2	Batch: BXD0259	QC Source Sample: 23D0472-02							
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	2			10	12500	12800		100	1.00
QC Sample ID: BXD0292-DUP1	Batch: BXD0292	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	0.7			10	1710	1720		20	1.00
QC Sample ID: BXD0292-DUP2	Batch: BXD0292	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	3			10	900	876		20	1.00
QC Sample ID: BXD0850-DUP1	Batch: BXD0850	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	2			10	1170	1190		20	1.00
QC Sample ID: BXD0850-DUP2	Batch: BXD0850	QC Source Sample: XXXXXXX-XX							
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	0.5			10	880	876		20	1.00
LCS - SM 2540 C									
QC Sample ID: BXD0259-BS1	Batch: BXD0259								
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
Total Dissolved Solids (TDS)	101		90 - 110		404		400	20	1.00
QC Sample ID: BXD0292-BS1	Batch: BXD0292								
Date Prepared: 04/10/2023	Date Analyzed: 04/10/2023								
Total Dissolved Solids (TDS)	105		90 - 110		420		400	20	1.00
QC Sample ID: BXD0850-BS1	Batch: BXD0850								
Date Prepared: 04/20/2023	Date Analyzed: 04/20/2023								
Total Dissolved Solids (TDS)	95		90 - 110		380		400	20	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Duplicate - SM 4500 H-B									
QC Sample ID: BXD0241-DUP1	Batch: BXD0241		QC Source Sample: 23D0472-01						
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
pH		0.675		3	7.4	7.4		0.1	1.00
SPH - Sample submitted past method specified holding time.									
QC Sample ID: BXD0242-DUP1	Batch: BXD0242		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/07/2023	Date Analyzed: 04/07/2023								
pH		0.685		3	7.3	7.3		0.1	1.00
SPH - Sample submitted past method specified holding time.									

CHEMTECH-FORD
LABORATORIES

5/18/2023

Work Order: 23D0470
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

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Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **23D0470-01**
Date Sampled: **4/6/23 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.58	pCi/L	0.26	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.26	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.27	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.7	pCi/L	0.40	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.40	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Castle Dale, UT 84513

PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **23D0470-02**
Date Sampled: **4/5/23 18:55**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.49	pCi/L	0.17	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.17	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.24	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.34	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.34	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.21	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **23D0470-03**
Date Sampled: **4/5/23 18:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.84	pCi/L	0.30	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.30	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.33	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.50	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.50	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.28	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **23D0470-04**
Date Sampled: **4/5/23 17:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.27	pCi/L	0.22	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.22	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.20	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.0	pCi/L	0.36	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.36	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.21	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **23D0470-05**
Date Sampled: **4/5/23 19:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.74	pCi/L	0.24	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.24	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.30	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.41	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.41	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **23D0470-06**
Date Sampled: **4/5/23 16:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.1	pCi/L	0.18	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.18	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.35	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	0.99	pCi/L	0.48	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.48	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **23D0470-07**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.55	pCi/L	0.31	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.31	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.45	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.45	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **23D0470-08**
Date Sampled: **4/5/23 15:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.64	pCi/L	0.22	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.22	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.28	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.9	pCi/L	0.42	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.42	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.25	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **23D0470-09**
Date Sampled: **4/6/23 17:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.94	pCi/L	0.28	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.28	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.35	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.6	pCi/L	0.39	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.39	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.25	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **23D0470-10**
Date Sampled: **4/6/23 15:45**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.90	pCi/L	0.18	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.18	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.32	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.5	pCi/L	0.55	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.55	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.33	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **23D0470-11**
Date Sampled: **4/6/23 14:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.86	pCi/L	0.29	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.33	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.4	pCi/L	0.44	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.44	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.27	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **23D0470-12**
Date Sampled: **4/6/23 15:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.93	pCi/L	0.21	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.21	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.32	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.4	pCi/L	0.38	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.38	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.22	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **23D0470-13**
Date Sampled: **4/6/23 12:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.2	pCi/L	0.26	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.26	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.37	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	0.66	pCi/L	0.52	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.52	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.28	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**

Matrix: **Water**
Lab ID: **23D0470-14**

Date Sampled: **4/5/23 0:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.1	pCi/L	0.17	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.17	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.34	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	1.0	pCi/L	0.44	EPA 904.0	5/9/23	5/12/23	SL-62
Radium-228 LLD	0.44	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.24	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **23D0470-15**
Date Sampled: **4/6/23 9:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.29	pCi/L	0.29	EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 LLD	0.29	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-226 Variance	0.23	pCi/L		EPA 903.0	5/4/23	5/10/23	SL-62
Radium-228	2.0	pCi/L	0.41	EPA 904.0	5/9/23	5/13/23	SL-62
Radium-228 LLD	0.41	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62
Radium-228 Variance	0.26	pCi/L		EPA 904.0	5/9/23	5/10/23	SL-62

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PO#:
Receipt: **4/7/23 12:31 @ 1.1** °C
Date Reported: 5/18/2023
Project Name: **Hunter Power Plant CCR**

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).
1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

SL-62 = Analysis performed by Pace Analytical National, Mount Juliet, TN 37122

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CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 3 (10 business days)
* Expedited turnaround subject to additional charge

23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
	1. ELF-1D	-	-	W		4	x	x	x	x	x	x	x	x				x								
01	2. ELF-2	4/6/2023	11:30	W		4	x	x	x	x	x	x	x	x				x								
	3. ELF-3	-	-	W		4	x	x	x	x	x	x	x	x				x								
02	4. ELF-4	4/5/2023	18:55	W		4	x	x	x	x	x	x	x	x				x								
03	5. ELF-5R	4/5/2023	18:20	W		4	x	x	x	x	x	x	x	x				x								
04	6. ELF-6R	4/5/2023	17:40	W		4	x	x	x	x	x	x	x	x				x								
05	7. ELF-7	4/5/2023	19:40	W		4	x	x	x	x	x	x	x	x				x								
06	8. ELF-8	4/5/2023	16:15	W		4	x	x	x	x	x	x	x	x				x								
07	9. ELF-9	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x								
	10. ELF-10	-	-	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time 4-7-23 12:31	Received by: [signature]	Date/Time 4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [sign	

AG(2)1298 AQ1296 M127

Sample Receipt Conditions:

( ) Custody Seals Present	(✓) Correct Containers	( ) Headspace Present (VOC)
(✓) Containers Intact	(✓) COC Included	( ) Temperature Blank
(✓) COC and Labels Match	(✓) COC Complete	(✓) Received within Hold
(✓) Received on Ice	(✓) Sufficient Sample Volume	Checked by:

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Payment Terms

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CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
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BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

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* Expedited turnaround subject to additional charge

23D0470

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																	Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/5/2023	15:20	W		4	x	x	x	x	x	x	x	x				x								
09	2. ELF-12	4/6/2023	17:00	W		4	x	x	x	x	x	x	x	x				x								
10	3. ELF-13	4/6/2023	15:45	W		4	x	x	x	x	x	x	x	x				x								
11	4. ELF-14	4/6/2023	14:30	W		4	x	x	x	x	x	x	x	x				x								
12	5. ELF-15	4/6/2023	15:10	W		4	x	x	x	x	x	x	x	x				x								
13	6. ELF-16	4/6/2023	12:15	W		4	x	x	x	x	x	x	x	x				x								
	7. ELF-17	-	-	W		4	x	x	x	x	x	x	x	x				x								
	8.																									
14	9. Duplicate - (CCR)	4/5/2023	-	W		4	x	x	x	x	x	x	x	x				x								
15	10. Field Blank - (CCR)	4/6/2023	9:50	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek | Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time 4-7-23 12:31	Received by: [signature]	Date/Time 4/7/23 1231
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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ATTACHMENT C:

Remedy Selection Progress Report – October 2023

Date: **October 15, 2023**
To: **Scott Wetzel**
From: **Dave Erickson**
Subject: **Semi-Annual Progress Report for Selecting and Designing Remedy**
Hunter Power Plant – CCR Landfill

In compliance with the requirements of the Coal Combustion Residuals (CCR) *Final Rule*, § 257.97(a), included herein is a semi-annual progress report for remedy selection and design. The Corrective Measures Assessment for the Hunter CCR Landfill was completed and posted to the plant operating record on 4/15/2019. The preferred alternative in the assessment was re-design and/or optimization of the existing horizontal well capture system, to address localized groundwater impacts. To date, the following activities have been completed in the selecting and designing a remedy:

- **6/28/2019:** Contract was initiated to complete an inspection of existing horizontal well system and to scope the work needed to evaluate the remedy.
- **7/23/2019:** Conducted a public meeting to discuss the results of the corrective measures assessment.
- **8/20/2019:** A site visit was completed by the project engineer to inspect and document the current condition of the existing horizontal well system. Research began on inspection, cleaning, and upgrade methods for the existing system.
- **8/26/2019:** Received comments from Heal Utah, Utah Clean Energy, and the Sierra Club. Comments were reviewed and addressed in Remedy Selection Report.
- **9/23/2019:** Contract was finalized to inspect each horizontal well using a mobile camera. Equipment will be on site during the inspection to clean the wells if warranted.
- **11/12/2019:** Inspection caps were removed from the horizontal capture wells in an attempt to inspect well integrity. Well construction prevented the camera from entering the wells to perform the inspections, due to the size of the internal opening.
- **June 2020:** The initial vendor tasked with performing inspections was unable to successfully retrofit their camera equipment to fit the well openings. Additional vendor sources to perform the well inspections were sought for procurement.
- **October 2020:** Remedy selection report, nature and extent report, and corrective measures sampling and analysis plan were placed in the plant operating record. The remedy selection report was also placed on the CCR website.
- **January 2021:** Performed full inspection of existing horizontal wells. The drainage from the wells continues to decrease and some routine maintenance was required.
- **March 2021:** An investigation to assess liquids in the landfill waste was attempted using Geoprobe direct push drilling methods. The drilling method could not reach the desired depths.
- **March 2022.** Sonic drilling was completed in the landfill to support an assessment of potential liquid in the landfill waste. Three new monitoring wells were installed downgradient of ELF-14. They include: ELF-15, ELF-16, and ELF-17. ELF-5 and ELf-6 were deepened due to decreasing water levels.

- **May-October 2022.** Sampling and evaluation of data acquired from the new monitoring wells installed in the landfill is ongoing, to determine if additional corrective measures are needed.
- **January 2023.** Results from 2022 assessment monitoring revealed Appendix IV constituents above their groundwater protection standards in monitoring well ELF-14. Because this well is the most downgradient well east of the landfill, additional monitoring well(s) may be required to comply with the CCR Rule.
- **February 2023.** As part of compliance with CCR Rule requirements § 257.95(g), PacifiCorp has sent a notification letter to the downgradient property owner and posted it on PacifiCorp's CCR website and in the Plant operating record. The notification was sent to the adjacent property owner to determine if proposed actions to install additional monitoring wells are acceptable to them.
- **March 2023.** A report is being developed detailing the findings of the supplemental investigations completed at the Hunter Landfill. This report will be used to evaluate if additional corrective measures are needed to address groundwater impacted by landfill discharge.
- **July 2023.** The supplemental investigation report was completed and placed in the Plant operating record. The report concluded interim corrective measures have been highly effective in reducing liquids in the landfill and capturing impacted groundwater beneath the landfill. These measures included removal of free liquids in process waster prior to its disposal in the landfill (2007) and the installation of horizontal wells beneath the landfill (2016). The combined actions have significantly reduced the saturated thickness in the landfill and reduced impacted groundwater beneath and around the landfill. The report makes the following recommendations:

    1. Continue monitoring effluent production from the horizontal well system.
    2. Abandon groundwater monitoring wells that have become dry as the result of horizontal well groundwater capture and install new deeper wells to facilitate groundwater monitoring.
    3. Continue assessment monitoring to determine if reduced leachate / impacted groundwater is influencing Appendix III and Appendix IV constituent concentrations.

Upcoming tasks relative to the CCR Landfill will include the following:

- Continue to monitor effluent production in existing horizontal wells;
- Abandon dry monitoring wells and install new, deeper wells to facilitate groundwater monitoring; and
- Continue semi-annual groundwater monitoring.