

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

January 2021



Prepared For:

Hunter Power Plant
Highway 10, S of Castle Dale
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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
SSL	Statistically Significant Level
UTL	Upper Tolerance Limit

1.0 CURRENT STATUS - § 257.90(e)(6)

This Groundwater Monitoring and Corrective Action Report was prepared for PacifiCorp by Water and Environmental Technologies. It was prepared to comply with the requirements detailed in *Code of Federal Regulations* § 257.90(e) (*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 2020.

- (i) The CCR Landfill was undergoing assessment monitoring at the start of 2020.
- (ii) The CCR Landfill remained in assessment monitoring at the end of 2020.
- (iii) Following completion of initial detection monitoring prior to October 17, 2017, statistically significant levels (SSLs) above site-specific background concentrations were noted for the following Appendix III constituents and monitoring wells.
 - (A) Boron in ELF-11, ELF-4, ELF-5, ELF-6, ELF-8, calcium in ELF-8, chloride in ELF-11, ELF-5, ELF-6, ELF-7, fluoride in ELF-4, ELF-5, ELF-6, ELF-7, ELF-8, pH in ELF-4, ELF-5, ELF-6, ELF-7, and sulfate and TDS in ELF-3.
 - (B) The CCR Landfill program transitioned to assessment monitoring on January 15, 2018.
- (iv) SSLs above groundwater protection standards were noted for Appendix IV constituents in 2020 as follows.
 - (A) Spring – cobalt in ELF-3, ELF-8, and ELF-11 and molybdenum in ELF-8; Fall - cobalt in ELF-8 and ELF-11 and molybdenum in ELF-8.
 - (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) Remedial activities were initiated and continued through the end of 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 Appendix IV

constituents: lithium and molybdenum exhibited SSLs above their groundwater protection standards.

Once Appendix IV constituents exhibited SSLs, 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 more fully delineate the nature and extent of impacts, and to support the assessment of corrective measures.

An inspection of the current condition and operation of the horizontal well capture system was inspected on August 20, 2019, November 12, 2019 and November 2020. Additional groundwater collected in 2019 and 2020 was 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. The corrective measures report was reviewed and based on the additional data a remedy was selected and placed on the BHE 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 2020 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 Action Program (Section 1.0);
- Summarize key actions completed (Section 5.0);
- Describe any problems encountered (Section 7.0);
- Discuss actions taken to resolve problems (Section 7.0); and
- Define key activities for the upcoming year (Section 8.0).

The Annual Groundwater Monitoring and Corrective Action 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 (Section 2.1 and 2.2).

- 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 (Section 3.0).
- 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 (Section 3.1).
- 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 monitoring network wells for the CCR Landfill were 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) and adequately monitor groundwater both hydraulically upgradient and downgradient of the site.

The monitoring wells for the CCR Landfill utilized to conduct detection and assessment monitoring between 2015 and 2019 include four background wells and seven downgradient wells. The background wells include four locations spanning the extent of the CCR Landfill east to west, and include: ELF-1D, ELF-2, ELF-9, and ELF-10. The background well spacing and distribution were developed to comply with the requirements of the CCR Rule. Monitoring results from these locations indicate they are not being influenced by groundwater passing waste in the CCR unit, providing results representative of background concentrations for the site.

Downgradient monitoring wells for the CCR Landfill include seven locations placed to capture groundwater as it passes the waste unit boundary. Using historical data and knowledge of the site from ongoing state mandated groundwater monitoring, downgradient wells were placed along the groundwater flow path which generally travels from west to east as it passes across 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.

To support an evaluation of the nature and extent of past releases at the CCR Landfill, 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.

2.1 Monitoring Well Decommissioning & Replacement in 2020

No wells were replaced or decommissioned for the Hunter Landfill monitoring network in 2020.

2.2 Additions to the Monitoring Network in 2020

No new wells were added to the Hunter Landfill monitoring network in 2020.

3.0 GROUNDWATER MONITORING

The CCR Landfill was transitioned to assessment monitoring in 2018. Two rounds of sampling and analysis were completed each year in 2018, 2019 and 2020 to comply with the CCR Rule, and 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.

Table 1 provides assessment monitoring data collected for the CCR Landfill. Attachments A and B contain field summary reports for the May and October 2020 sampling events. They consist of groundwater contour maps, data validation, statistical analyses, field data sheets, and laboratory data packages for each event.

3.1 Continuation - Assessment Monitoring

In accordance with the CCR Rule, the CCR Landfill remains in assessment monitoring while PacifiCorp prepares to implement corrective measures. To support ongoing monitoring, site-specific background (UTL) concentrations were combined with *EPA National Primary Drinking Water Standards* to create groundwater protection standards for the CCR Landfill. After updating the statistics to incorporate the 2020 monitoring data for upgradient wells, the higher of these values was adopted as the groundwater protection standard. These comparisons for the two 2020 monitoring events are provided in Tables 2 and 3.

Table 2 indicates cobalt (ELF-3, ELF-8, and ELF-11) and molybdenum (ELF-8) exhibited SSLs above their groundwater protection standards for the May 2020 event. Table 3 indicates cobalt (ELF-8 and ELF-11) and molybdenum (ELF-8) exhibited SSLs above their groundwater protection standards for the October 2020 event.

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 elements 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. Existing groundwater monitoring data indicates the capture system has contained groundwater impacts to an area immediately downgradient of the waste unit boundary.

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 2020.

6.0 PROBLEMS & RESOLUTIONS

Monitoring wells ELF-1D (fall), ELF-5 (spring and fall), or ELF-6 (spring and fall) produced insufficient water to support sampling. As a result, neither has been used in developing groundwater contour maps or statistical analyses for the site in 2020. No other problems were noted during the 2020 monitoring period.

7.0 UPCOMING YEAR

During 2021, it is anticipated PacifiCorp will complete the following activities at the CCR Landfill:

Semi-Annual Monitoring

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

Corrective Measures

- Continue operating existing horizontal wells;
- Design and install monitoring wells in the ash to monitor effectiveness of system;
- Evaluate data to determine if additional corrective measures are appropriate;
- Implement corrective action groundwater monitoring plan; and
- Evaluate need for additional remedial activities.

8.0 REFERENCES

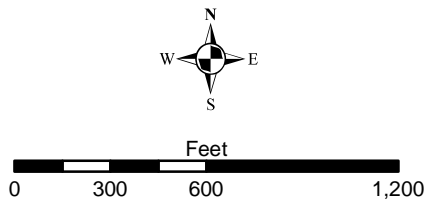
- EPA 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-540-R-201 7-001, January 2017.
- EPA 2010. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater from Monitoring Wells, EPASOP-GW 001, January 2010.
- EPA 1989. Risk Assessment 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



Legend

MasterWells



HUNTER POWER PLANT

CCR Sample Locations

Job#: PERCM52

Date: 1/21/2019

Path: M:\PERC_CCR\Hunter\2018\Moly_53018.mxd, Author: jeprowse

FIGURE 1

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	pCi/L	Q				
ELF-1D	Background	9/18/2015	5669.55	84.43	5585.12	NS - Not enough water																																											
		11/10/2015		NM	NM	NS - Not enough water																																											
		12/1/2015		84.41	5585.14	NS - Not enough water																																											
		1/12/2016		84.25	5585.30	NS - Not enough water																																											
		2/2/2016		84.14	5585.41	NS - Not enough water																																											
		3/9/2016		NM	NM	NS - Not enough water																																											
		4/6/2016		83.45	5586.10	NS - Not enough water																																											
		5/4/2016		83.60	5585.95	NS - Not enough water																																											
		5/9/2017		82.60	5586.95	NS - Not enough water																																											
		8/2/2017		82.35	5587.20	NS - Not enough water																																											
		2/15/2018		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					
		5/30/2018		99.87	5569.68	NS - Not enough water																																											
		5/8/2019		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				
		8/20/2019		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		J+	0.0000900		UJ	0.0161	0.00200		0.00200		1.09				
5/13/2020		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																																													
ELF-2	Background	9/18/2015	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		0.00600		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		0.002		0.0005		0.002		0.0004		0.002		4.93			0.00015		0.0034		0.55600		0.002		0.80		
		12/1/2015		21.02	5591.00	3.24		392		461	0.1		7.21		8320	11500		0.002		0.002		0.0128		0.002		0.002		0.0005		0.002		0.00559		0.002		3.97			0.00015		0.0038		0.53000		0.002		8.10		J+
		1/12/2016		21.29	5590.73	3.38		420		473	0.277		7.24		8180	12300		0.002		0.002		0.0207		0.002		0.002		0.0005		0.002		0.01140		0.002		4.08			0.00015		0.0043		0.49900		0.002		1.99		
		2/2/2016		21.43	5590.59	3.50		410		471	0.100		7.14		7350	12000		0.002		0.002		0.0119		0.00																									

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 – May 2020 Event

Analyte	Upper Tolerance Limit (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standards
Antimony	0.004	0.006	None Exceed
Arsenic	0.0117	0.0117	None Exceed
Barium	0.102	2.0	None Exceed
Beryllium	0.002	0.004	None Exceed
Cadmium	0.0011	0.005	None Exceed
Chromium	0.0201	0.1	None Exceed
Cobalt	0.0114	0.0114	ELF-11, ELF-3, ELF-8
Fluoride Appendix IV	4.36	4.36	None Exceed
Lead	0.012	0.015	None Exceed
Lithium	4.79	4.79	None Exceed
Mercury	0.00009	0.002	None Exceed
Molybdenum	0.158	0.158	ELF-8
Radium	6.645	6.645	None Exceed
Selenium	0.608	0.608	None Exceed
Thallium	0.002	0.002	None Exceed

Table 3. Summary of Groundwater Quality Comparisons – October 2020 Event

Analyte	Upper Tolerance Limit (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	2.00	2.00	None Exceed
Beryllium	0.002	0.004	0.004	None Exceed
Cadmium	0.0011	0.005	0.005	None Exceed
Chromium	0.0201	0.1000	0.1000	None Exceed
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride Appx IV	4.36	4.00	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.65	0.040	4.65	None Exceed
Mercury	0.00009	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
Radium	6.28	5.0	6.28	None Exceed
Selenium	0.608	0.1	0.608	None Exceed
Thallium	0.002	0.002	0.002	None Exceed

ATTACHMENT A:

Field Summary Report – June 2020 Event

Facility Name: Hunter Power Plant – CCR Landfill
Event Description: Assessment Monitoring
Event Dates: May 12-13, 2020
Field Personnel: Mike Shirley (WET), Dennis Vanderbeek (PacifiCorp),
Bradley Giles (PacifiCorp)

ACTIVITY SUMMARY. WET and PacifiCorp personnel arrived onsite May 12, 2020 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-1D
- ELF-2
- ELF-9
- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-3
- ELF-4
- ELF-5
- ELF-6
- ELF-7
- ELF-8
- ELF-10

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

- Date fieldwork completed: 5/13/2020
- Dates unvalidated lab data received: 6/17/2020
- Data validation completion date: 7/8/2020

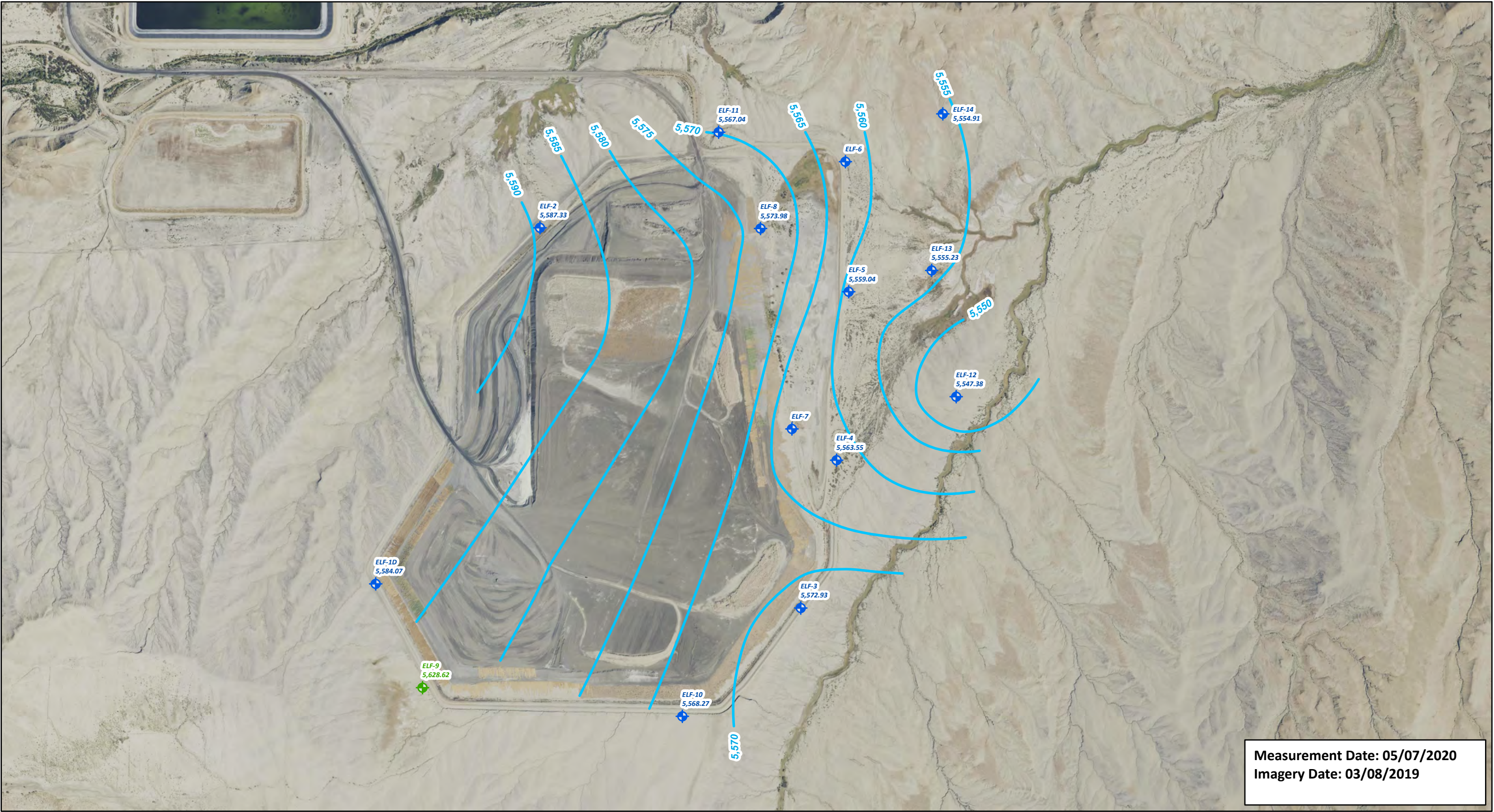
After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to American West Analytical Laboratories (AWAL) in Salt Lake City, Utah for analysis. Samples arrived at AWAL on 5/15/2020. AWAL subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 5/21/2020. 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-10 and ELF-5 did not produce enough water to take full sample sets. Well ELF-6 did not produce any water and was not able to be sampled.

Attachment A:

Groundwater Contour Map

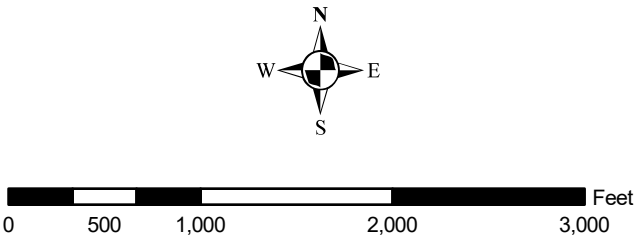


 CCR Well

 CCR Well - For Water Quality Only

 Groundwater Elevation Contour (Contour Interval = 5 Ft.)

ELF-1D= Well ID
5,584.07 = Water Level Elevation (ft.)



HUNTER POWER PLANT	
<i>Groundwater Elevation Map CCR Landfill</i>	
Job#: PERCM052	Attachment A
Date: 9/28/2020	
Path: M:\PERC_CCR2020_CCR_Sampling\Hunter2020_CCR_Final2020_CCR_Final.aprx, Author: jhulla	

Attachment B:

Data Validation Summary

**DATA VALIDATION SUMMARY
CCR COMPLIANCE SAMPLING**

Facility Name:	Hunter Power Plant	
Validator:	Janelle Garza (6/11/2020)	
Reviewer:	(R1) Stefanie Vandaele (6/29/2020); (R2) Marcus Holland (7/8/2020)	
Laboratory:	American West Analytical Laboratories; Salt Lake City, UT ALS Laboratories; Fort Collins, CO (third party lab for Ra analyses)	
Laboratory Work Order#:	2005382	
Sample Media:	Aqueous	
Review Element:	Complete / Criteria Met? (Yes/No)	If no, describe:
Chain of Custody:	No	No time was recorded for Group B – DUP on the COC or sample receipt form for samples upon arrival at ALS laboratories.
Field Documentation:	Yes	
Holding Times & Sample Preservation:	No	<ul style="list-style-type: none"> ❖ The laboratory flagged all pH results for technical holding time exceedance (>24 hours). pH is measured in the field, and it is not feasible to laboratory analyze pH within 24 hours from time of collection. Therefore, these flags are disregarded, and no qualification is necessary. ❖ TDS in sample ELF-9 was analyzed 22 days after collection, past the holding time of 7 days. This data point was qualified as estimated low (J-) due to a detected result. However, this data point was also qualified as estimated high (J+) from field blank contamination, resulting in a combined J (estimated detect) qualifier. ❖ Samples ELF-10 and ELF-1D had limited volume upon receipt at ALS. No action required. ❖ Samples ELF-11, ELF-12, and ELF-3 were received at ALS with a pH>2. Preservative was added to bring pH to an acceptable range. No action required.
Calibrations:	Yes	
Blanks:	No	<p>TDS were detected in the field blank (FB) at 80 mg/L, above the RL of 10 mg/L.</p> <ul style="list-style-type: none"> ❖ Samples ELF-1D and ELF-9 were qualified as estimated high (J+) and reported at the FB value (4000 mg/L) due to results >RL but <10x FB value. However, ELF-9 was also qualified as estimated low (J-) due to holding time exceedance, resulting in a combined J (estimated detect) qualifier. ❖ All remaining samples did not require qualification due to results $\geq 10 \times$ MB value.
Laboratory Control Sample:	Yes	
Duplicates:	Yes	

**DATA VALIDATION SUMMARY
CCR COMPLIANCE SAMPLING**

Matrix Spike:	No	Calcium in Lab Sample ID 2005382-013BMS and 2005382-013BMSD had very poor recoveries at -204% and -70.6% (limits 70-130%). This Lab Sample ID was associated with Client Sample ID Group B - DUP. The analyte concentration was too high for accurate MS recovery and/or RPD. These results are being disregarded for evaluation.
Overall Assessment:		
Out of 322 total data points, 320 data points (99.4%) remain unqualified and are considered quantitative and usable data. Two data points (0.6%) were qualified as estimated (J and J+) due to holding time exceedance and field blank contamination and are considered qualitative data. No data points were rejected; thus, this sample delivery group is 100% complete and usable.		

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 wells associated with the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to compare upgradient with downgradient wells 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 with downgradient water quality.

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis was 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 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 2020).

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.

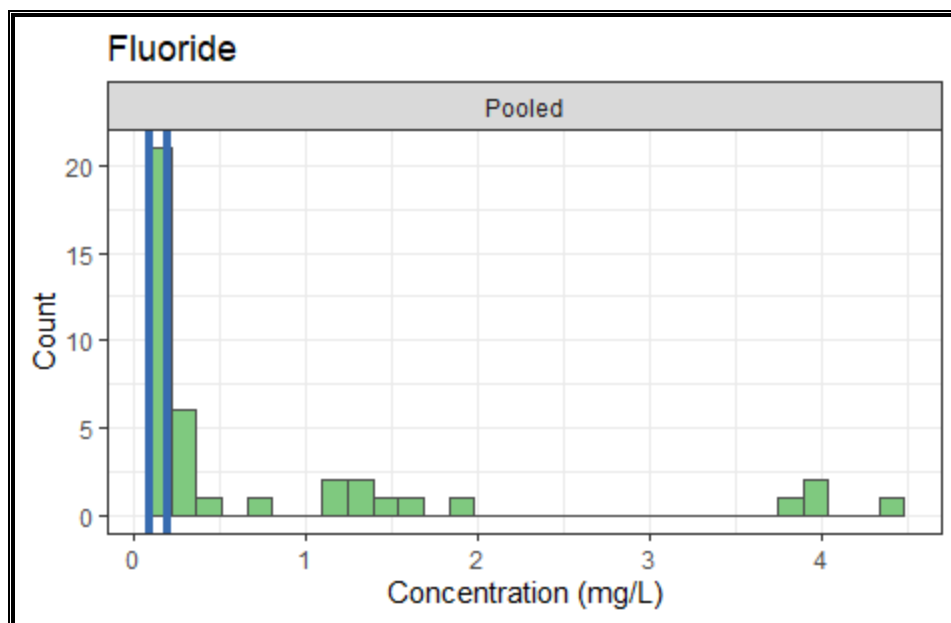


Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

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.

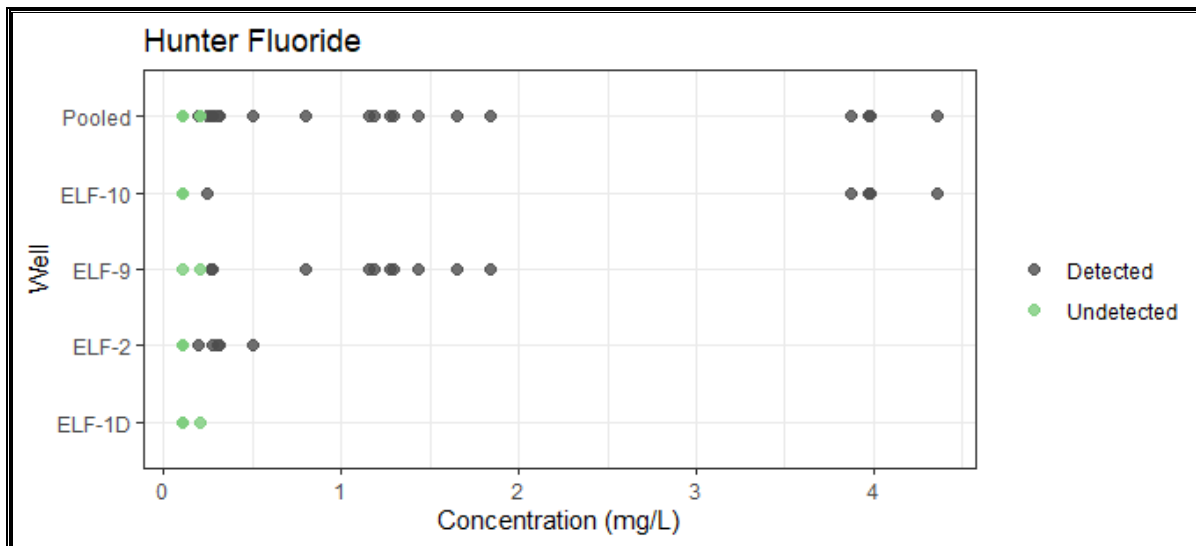


Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

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 cadmium, cobalt, lead, pH, and radium data CCR Landfill data. However, none of the outliers are extreme enough to warrant removal from the dataset. The MDLs for the non-detects in the boron upgradient data 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 Groundwater Protection Standard (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.

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

2.3 Summary Results

Table C.1 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. Analytes that were not detected in any upgradient well samples are not listed in Table C.1.

Table C.1. 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 (%)
Arsenic	ELF-1D	4	0	<0.002	NA	NA	NA
Arsenic	ELF-2	15	0	<0.002	NA	NA	NA
Arsenic	ELF-9	13	13	0.0068	0.0075	0.0022	29
Arsenic	ELF-10	12	3	<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 (%)
Arsenic	Pooled	44	16	<0.002	NA	NA	NA
Barium	ELF-1D	4	4	0.0094	NA	NA	NA
Barium	ELF-2	15	14	0.0104	0.0138	0.0105	76
Barium	ELF-9	13	13	0.0323	0.0422	0.0337	80
Barium	ELF-10	12	12	0.0372	0.0423	0.0217	51
Barium	Pooled	44	43	0.0155	0.0296	0.0263	89
Boron	ELF-1D	3	3	2.19	NA	NA	NA
Boron	ELF-2	14	14	3.36	3.38	0.18	5
Boron	ELF-9	11	11	1.49	1.52	0.21	14
Boron	ELF-10	11	11	1.62	1.67	0.18	11
Boron	Pooled	39	39	1.87	2.28	0.87	38
Cadmium	ELF-1D	4	0	<0.0005	NA	NA	NA
Cadmium	ELF-2	15	0	<0.0005	NA	NA	NA
Cadmium	ELF-9	13	1	<0.0005	NA	NA	NA
Cadmium	ELF-10	12	6	0.0005	NA	NA	NA
Cadmium	Pooled	44	7	<0.0005	NA	NA	NA
Calcium	ELF-1D	3	3	366	NA	NA	NA
Calcium	ELF-2	14	14	407	403	20.8	5
Calcium	ELF-9	12	12	59.5	76	33.7	44
Calcium	ELF-10	11	11	474	480	29.0	6
Calcium	Pooled	40	40	397	323	170	52
Chloride	ELF-1D	3	3	6640	NA	NA	NA
Chloride	ELF-2	14	14	442	381	109	29
Chloride	ELF-9	12	12	381	401	95.6	24
Chloride	ELF-10	11	11	7530	7905	1686	21
Chloride	Pooled	40	40	465	2926	3617	124
Chromium	ELF-1D	4	1	<0.002	NA	NA	NA
Chromium	ELF-2	15	2	<0.002	NA	NA	NA
Chromium	ELF-9	13	7	0.0036	NA	NA	NA
Chromium	ELF-10	12	9	0.004	0.0051	0.0042	82
Chromium	Pooled	44	19	<0.002	NA	NA	NA
Cobalt	ELF-1D	4	1	<0.004	NA	NA	NA
Cobalt	ELF-2	15	8	0.005	0.0055	0.0020	37
Cobalt	ELF-9	13	2	<0.004	NA	NA	NA
Cobalt	ELF-10	12	9	0.0044	0.0051	0.0014	28

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Cobalt	Pooled	44	20	<0.004	NA	NA	NA
Fluoride	ELF-1D	3	0	<0.1	NA	NA	NA
Fluoride	ELF-2	14	7	0.1	NA	NA	NA
Fluoride	ELF-9	12	10	1.2	0.96	0.61	64
Fluoride	ELF-10	11	5	<0.1	NA	NA	NA
Fluoride	Pooled	40	22	0.20	0.78	1.21	154
Lead	ELF-1D	4	0	<0.002	NA	NA	NA
Lead	ELF-2	15	1	<0.002	NA	NA	NA
Lead	ELF-9	13	4	<0.002	NA	NA	NA
Lead	ELF-10	12	6	0.0021	NA	NA	NA
Lead	Pooled	44	11	<0.002	NA	NA	NA
Lithium	ELF-1D	4	4	2.16	NA	NA	NA
Lithium	ELF-2	15	15	1.75	2.44	1.25	51
Lithium	ELF-9	13	13	0.888	1.06	0.491	46
Lithium	ELF-10	12	12	2.13	2.35	1.10	47
Lithium	Pooled	44	44	1.68	1.98	1.12	57
Molybdenum	ELF-1D	4	4	0.0163	NA	NA	NA
Molybdenum	ELF-2	15	15	0.0031	0.0033	0.0007	21
Molybdenum	ELF-9	13	13	0.1170	0.1145	0.0242	21
Molybdenum	ELF-10	12	12	0.0863	0.0868	0.0313	36
Molybdenum	Pooled	44	44	0.0582	0.0602	0.0530	88
pH	ELF-1D	3	3	7.27	NA	NA	NA
pH	ELF-2	14	14	7.23	7.28	0.17	2
pH	ELF-9	12	12	7.92	7.89	0.15	2
pH	ELF-10	11	11	7.15	7.22	0.42	6
pH	Pooled	40	40	7.29	7.44	0.39	5
Radium	ELF-1D	4	4	1.72	NA	NA	NA
Radium	ELF-2	15	15	1.37	1.92	1.84	96
Radium	ELF-9	13	13	1.38	1.44	0.60	42
Radium	ELF-10	12	12	2.44	3.22	3.60	112
Radium	Pooled	44	44	1.53	2.12	2.25	106
Selenium	ELF-1D	4	0	<0.002	NA	NA	NA
Selenium	ELF-2	15	15	0.398	0.317	0.219	69
Selenium	ELF-9	13	1	<0.002	NA	NA	NA
Selenium	ELF-10	12	9	0.0098	0.0953	0.135	142

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Selenium	Pooled	44	25	0.0069	0.135	0.198	147
Sulfate	ELF-1D	3	3	8640	NA	NA	NA
Sulfate	ELF-2	14	14	7910	7569	714	9
Sulfate	ELF-9	12	12	6610	6494	790	12
Sulfate	ELF-10	11	11	17300	16048	4522	28
Sulfate	Pooled	40	40	7950	9643	4678	49
TDS	ELF-1D	3	3	27000	NA	NA	NA
TDS	ELF-2	14	14	12000	11907	423	4
TDS	ELF-9	12	12	10550	10743	839	8
TDS	ELF-10	11	11	38200	37664	2162	6
TDS	Pooled	40	40	12000	19811	11987	61

Table C.2 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.2.

Table C.2. 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)
Arsenic	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-2	<0.001	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-9	0.005	0.006	0.0068	0.0086	0.0117
Arsenic	ELF-10	<0.002	<0.002	<0.002	0.0025	0.0093
Arsenic	Pooled	<0.001	<0.002	<0.002	0.0056	0.0117
Barium	ELF-1D	0.0084	0.0084	0.0085	0.0094	0.0103
Barium	ELF-2	<0.0084	0.0092	0.0106	0.0126	0.05
Barium	ELF-9	0.0126	0.0158	0.0335	0.0774	0.102
Barium	ELF-10	0.0184	0.0316	0.0391	0.056	0.0863
Barium	Pooled	<0.0084	0.0111	0.0186	0.0433	0.102
Boron	ELF-1D	2.19	2.20	2.21	2.22	2.23
Boron	ELF-2	3.11	3.25	3.33	3.50	3.77
Boron	ELF-9	1.30	1.35	1.45	1.60	1.91
Boron	ELF-10	1.48	1.57	1.63	1.72	2.12

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Boron	Pooled	1.30	1.57	1.87	3.26	3.77
Cadmium	ELF-1D	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	ELF-2	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Cadmium	ELF-9	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Cadmium	ELF-10	<0.0005	<0.0005	0.0005	0.0006	0.0011
Cadmium	Pooled	<0.0005	<0.0005	<0.0005	<0.0005	0.0011
Calcium	ELF-1D	366	369	372	374	377
Calcium	ELF-2	364	392	410	419	430
Calcium	ELF-9	52.7	57.5	60.3	88.1	166
Calcium	ELF-10	445	460	475	496	543
Calcium	Pooled	52.7	107	400	445	543
Chloride	ELF-1D	6430	6543	6655	6768	6880
Chloride	ELF-2	218	363	444	461	473
Chloride	ELF-9	282	334	371	431	527
Chloride	ELF-10	5710	7000	7340	7635	9900
Chloride	Pooled	218	369	459	6813	9900
Chromium	ELF-1D	<0.002	<0.002	<0.002	0.0022	0.0023
Chromium	ELF-2	<0.001	<0.002	<0.002	<0.002	0.011
Chromium	ELF-9	<0.002	<0.002	0.0044	0.0142	0.0201
Chromium	ELF-10	<0.002	<0.002	0.005	0.0061	0.0164
Chromium	Pooled	<0.001	<0.002	<0.002	0.0054	0.0201
Cobalt	ELF-1D	<0.004	<0.004	<0.004	0.0047	0.0054
Cobalt	ELF-2	<0.004	<0.004	0.0045	0.0059	0.0114
Cobalt	ELF-9	<0.004	<0.004	<0.004	<0.004	0.0052
Cobalt	ELF-10	<0.004	<0.0041	0.0044	0.0055	0.0079
Cobalt	Pooled	<0.004	<0.004	<0.004	0.0054	0.0114
Fluoride	ELF-1D	<0.1	<0.13	<0.15	<0.18	<0.2
Fluoride	ELF-2	<0.1	<0.1	0.1	0.277	0.5
Fluoride	ELF-9	<0.1	0.268	1.19	1.36	1.84
Fluoride	ELF-10	<0.1	<0.1	0.172	3.95	4.36
Fluoride	Pooled	<0.1	<0.1	0.222	1.21	4.36
Lead	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	ELF-2	<0.001	<0.002	<0.002	<0.002	0.002
Lead	ELF-9	<0.002	<0.002	<0.002	0.0045	0.0077
Lead	ELF-10	<0.002	<0.002	0.0022	0.0031	0.012
Lead	Pooled	<0.001	<0.002	<0.002	0.002	0.012

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Lithium	ELF-1D	2.12	2.16	2.19	2.20	2.2
Lithium	ELF-2	1.34	1.53	1.76	3.82	4.93
Lithium	ELF-9	0.724	0.756	0.845	1.06	2.48
Lithium	ELF-10	0.841	1.65	2.09	2.85	4.59
Lithium	Pooled	0.724	1.09	1.68	2.20	4.93
Molybdenum	ELF-1D	0.0161	0.0163	0.0165	0.0186	0.0207
Molybdenum	ELF-2	0.0026	0.003	0.0031	0.0037	0.005
Molybdenum	ELF-9	0.0679	0.1082	0.1195	0.1275	0.158
Molybdenum	ELF-10	0.0516	0.0706	0.0871	0.1165	0.124
Molybdenum	Pooled	0.0026	0.0037	0.0648	0.1155	0.158
pH	ELF-1D	7.02	7.08	7.15	7.21	7.27
pH	ELF-2	7.12	7.17	7.22	7.30	7.76
pH	ELF-9	7.51	7.86	7.94	7.99	8.06
pH	ELF-10	6.88	7.03	7.18	7.27	8.37
pH	Pooled	6.88	7.17	7.29	7.86	8.37
Radium	ELF-1D	1.09	1.16	1.23	1.93	2.63
Radium	ELF-2	0.61	0.873	1.31	2.22	8.10
Radium	ELF-9	0.64	1.03	1.36	1.86	2.60
Radium	ELF-10	0.46	1.67	2.47	3.26	14.2
Radium	Pooled	0.46	0.978	1.44	2.34	14.2
Selenium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	ELF-2	0.0319	0.115	0.424	0.490	0.608
Selenium	ELF-9	<0.002	<0.002	<0.002	<0.002	0.0042
Selenium	ELF-10	<0.002	<0.0051	0.0105	0.152	0.410
Selenium	Pooled	<0.002	<0.002	0.0098	0.309	0.608
Sulfate	ELF-1D	7730	7958	8185	8413	8640
Sulfate	ELF-2	6030	7190	7950	8150	8370
Sulfate	ELF-9	5460	5790	6470	6875	8030
Sulfate	ELF-10	10000	14025	18300	19875	20700
Sulfate	Pooled	5460	6833	7950	10075	20700
TDS	ELF-1D	26800	26850	26900	26950	27000
TDS	ELF-2	11300	11500	12000	12300	12600
TDS	ELF-9	9420	10350	10600	11550	12000
TDS	ELF-10	35200	37350	38300	39350	40300
TDS	Pooled	9420	11375	12000	35225	40300

3.0 UPGRAIDENT AND DOWNGRAIDENT 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, was 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 the outliers are present in the cadmium, cobalt, lead, pH, and radium 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.3 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 and radium. Non-parametric UTLs were computed for all of the analytes except for lithium and radium.

Table C.3. Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	Well	W-Statistic	P-Value	Normal
Barium	Pooled	0.7781	<0.0001	No
Boron	Pooled	0.8202	<0.0001	No
Calcium	Pooled	0.7927	<0.0001	No
Chloride	Pooled	0.7051	<0.0001	No
Fluoride	Pooled	0.6155	<0.0001	No
Lithium	Pooled	0.8751	<0.0001	No
Cube Root of Lithium	Pooled	0.9536	0.0032	Yes
Molybdenum	Pooled	0.8438	<0.0001	No
pH	Pooled	0.9084	<0.0001	No
Radium	Pooled	0.5363	<0.0001	No
LN of Radium	Pooled	0.9439	0.0008	Yes
Selenium	Pooled	0.6970	<0.0001	No
Sulfate	Pooled	0.7185	<0.0001	No
TDS	Pooled	0.7109	<0.0001	No

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.4 lists the UTL, MCL, and GWPS for each of the analytes detected 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, calcium, cobalt, molybdenum, pH, sulfate, and total dissolved solids exceed the GWPS. Table C.4 list the GWPSs and the wells that exceed the GWPS for each analyte (Figure C.4). GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.4. 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 Background or Groundwater Protection Standards
Boron	3.77	NA	3.77	ELF-11, ELF-4, ELF-8
Calcium	543	NA	543	ELF-8
Chloride	11800	NA	11800	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
pH Acidic Range	6.85	NA	6.85	ELF-7
pH Basic Range	8.37	NA	8.37	Within Limit
Sulfate	20700	NA	20700	ELF-3
TDS	40300	NA	40300	ELF-3
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.00	2.0	Within Limit
Beryllium	0.002	0.004	0.004	Within Limit
Cadmium	0.0011	0.005	0.005	Within Limit
Chromium	0.0201	0.1	0.1	Within Limit
Cobalt	0.0114	0.006	0.0114	ELF-11, ELF-3, ELF-8
Fluoride Appendix IV	4.36	4.0	4.36	Within Limit

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Background or Groundwater Protection Standards
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.79	0.04	4.79	Within Limit
Mercury	0.00009	0.002	0.002	Within Limit
Molybdenum	0.158	0.1	0.158	ELF-8
Radium	6.645	5.0	6.645	Within Limit
Selenium	0.608	0.1	0.608	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

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. Statistically significant increases above groundwater protection standards were noted for Appendix IV constituents cobalt and molybdenum in the downgradient wells for the CCR Landfill.

5.0 REFERENCES

EPA, 2009, “Statistical Analysis Of Groundwater Monitoring Data At RCRA Facilities Unified Guidance,” EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.

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

R Core Team, 2020, *R: A Language and Environment for Statistical Computing*, <https://www.R-project.org>, R Foundation for Statistical Computing, Vienna, Austria.

Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

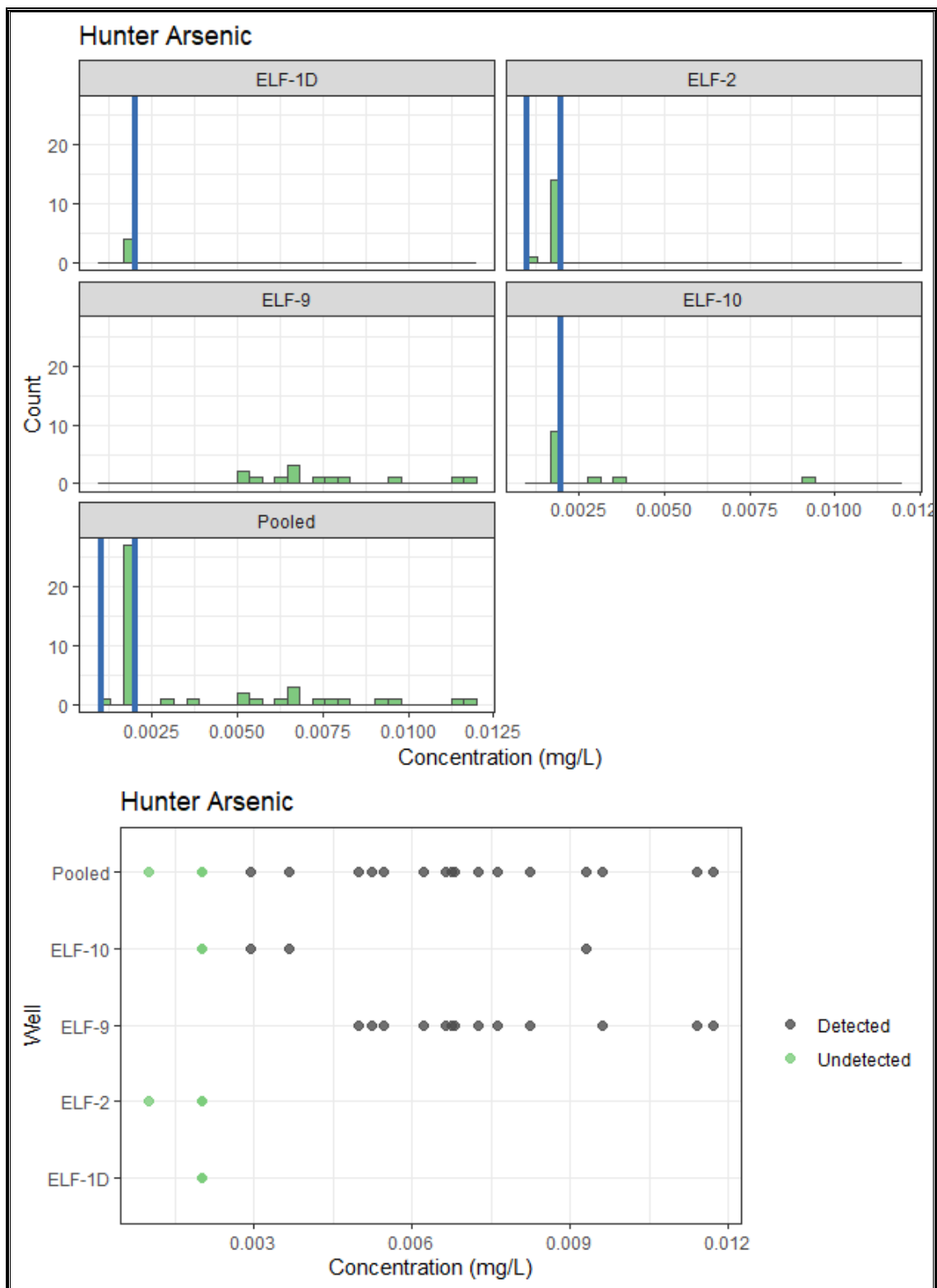


Figure C.3. Histograms and dot plots for the upgradient CCR Landfill data.

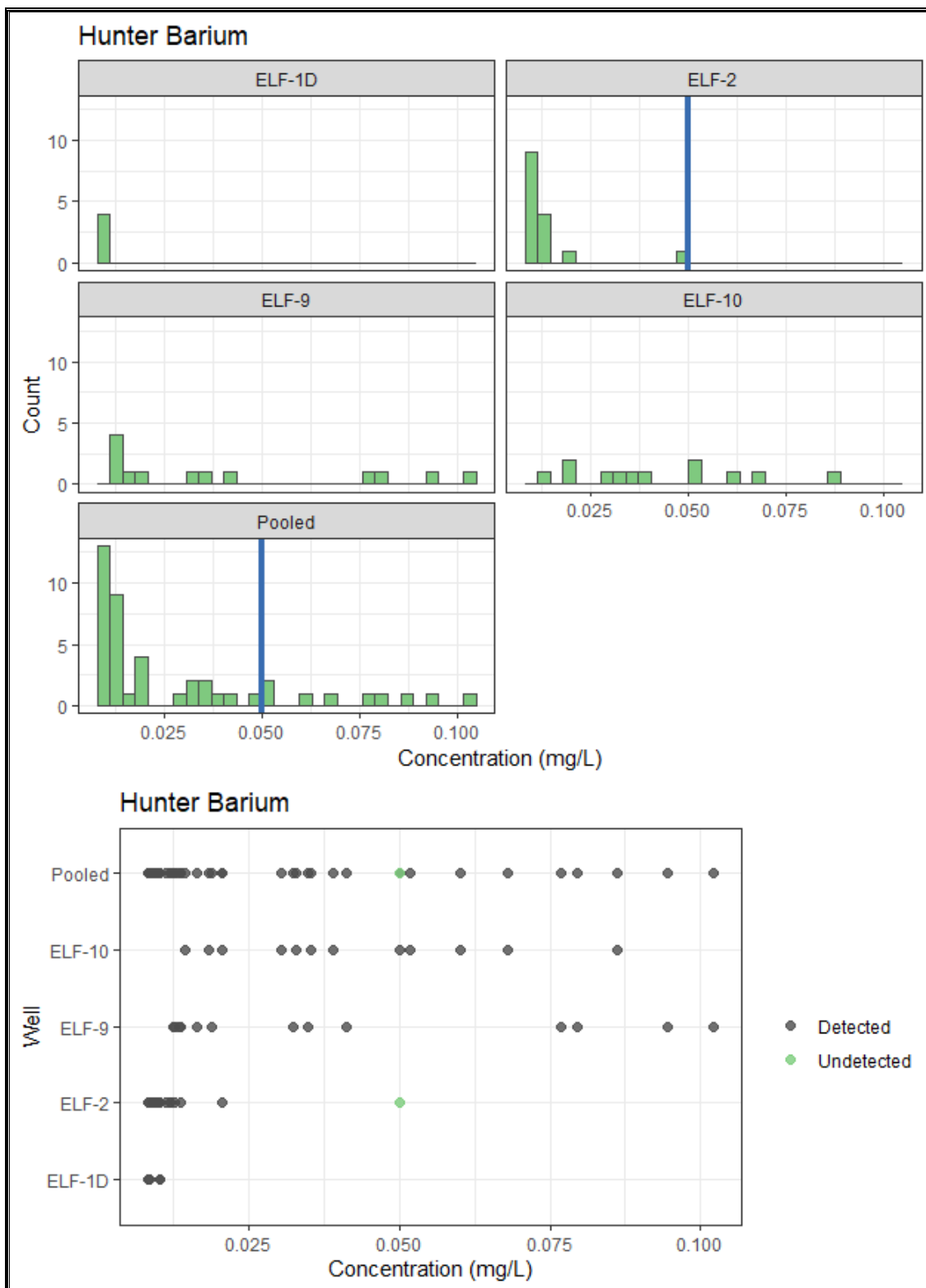


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

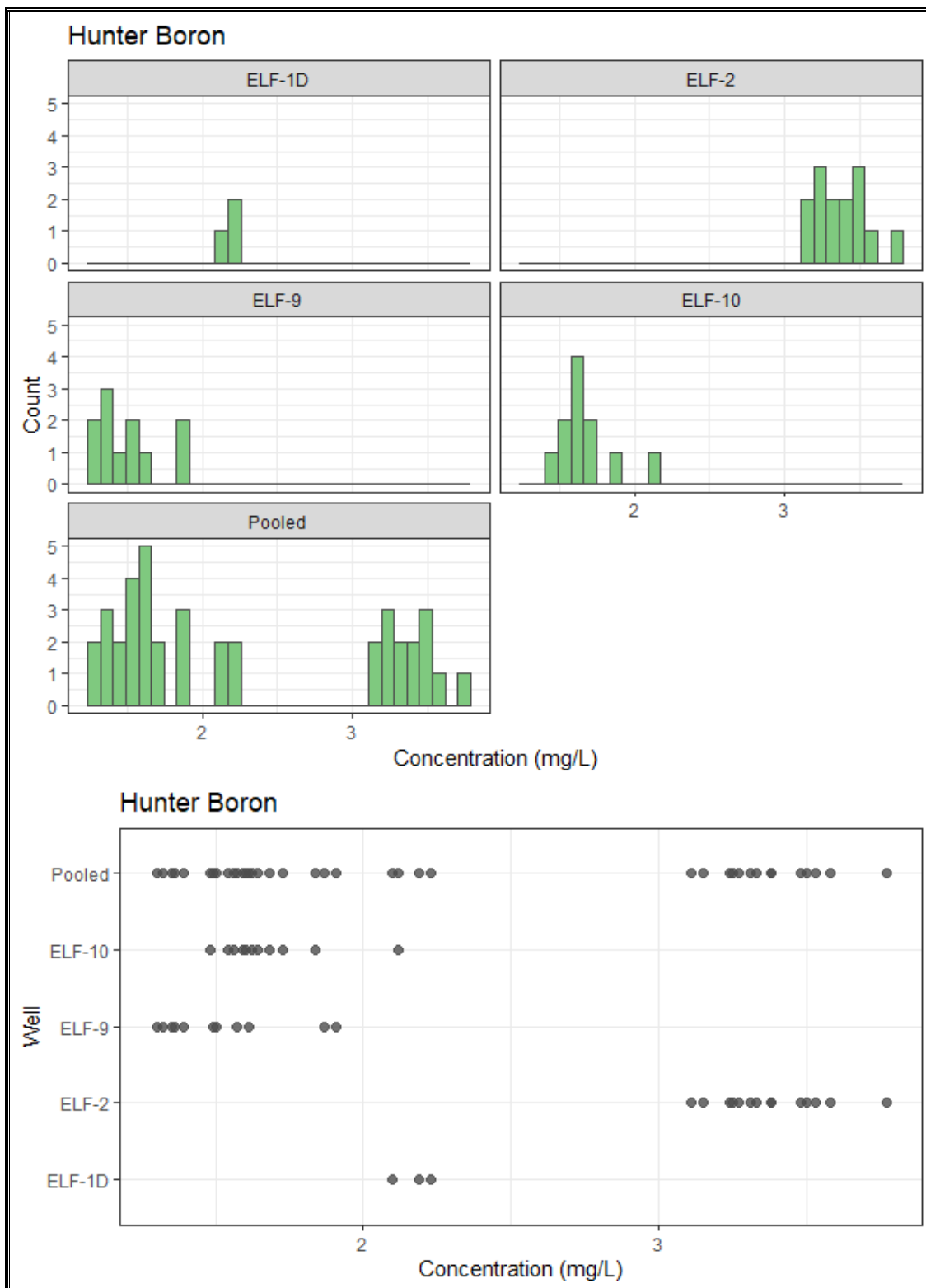


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

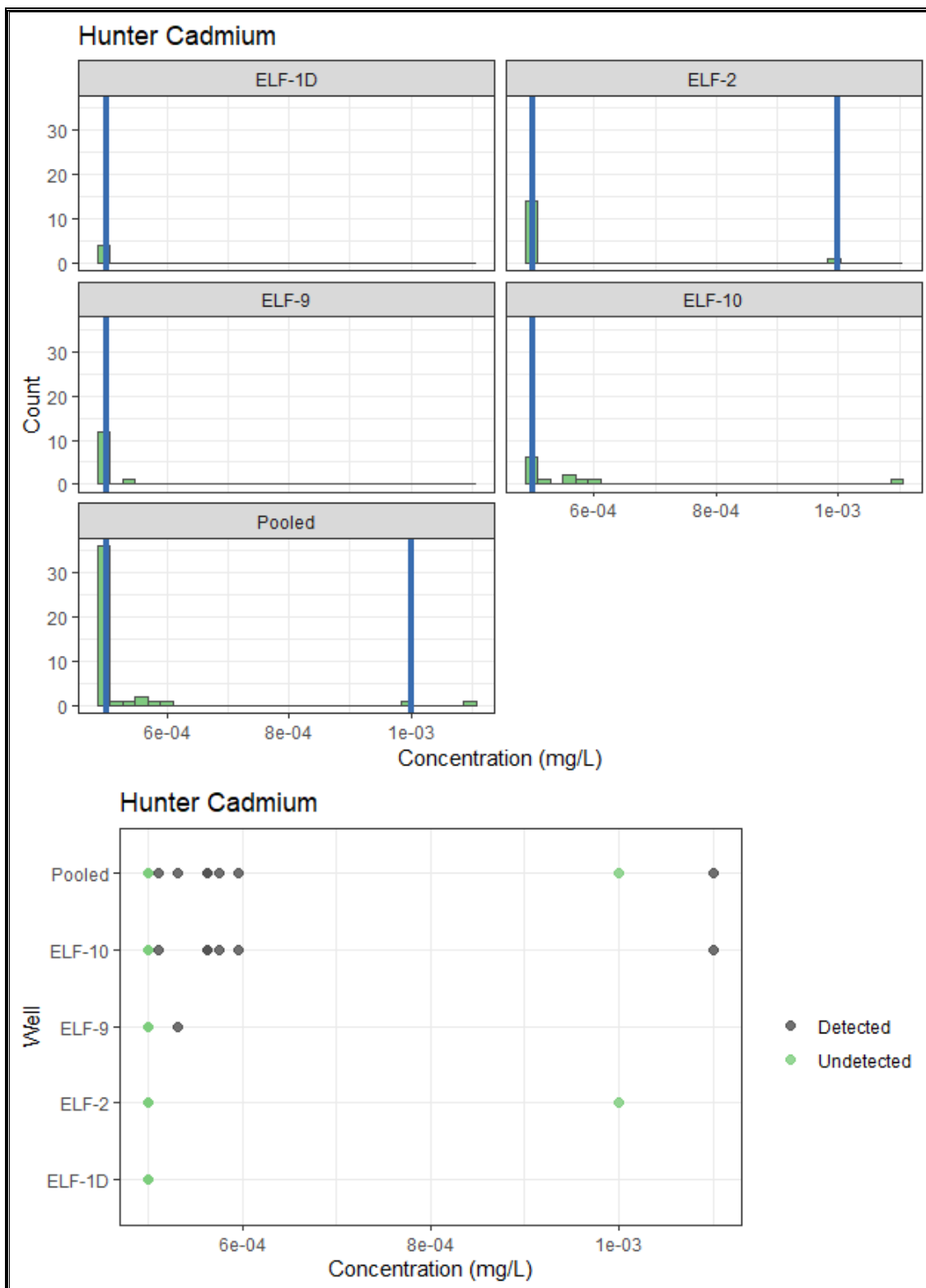


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

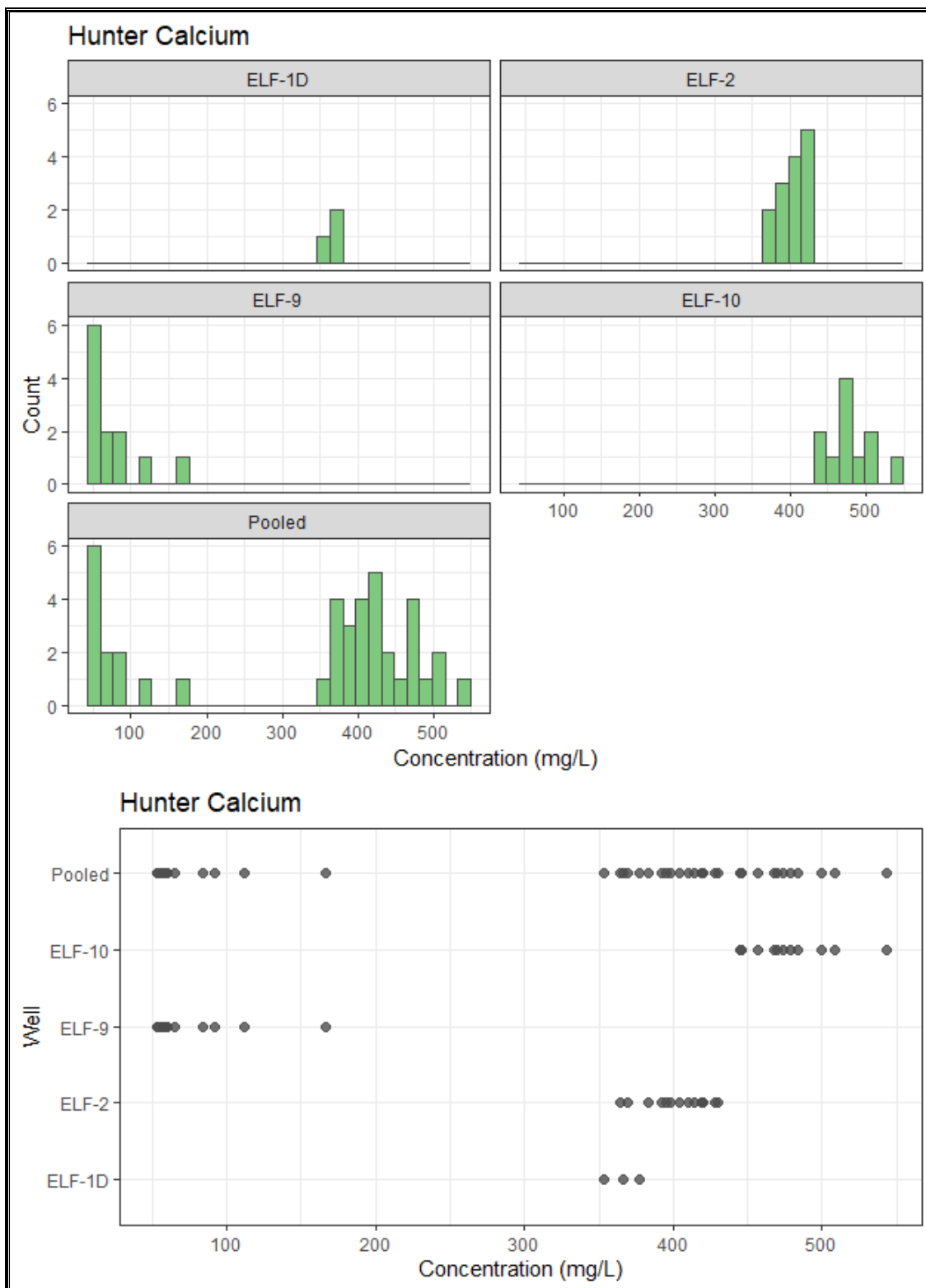


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

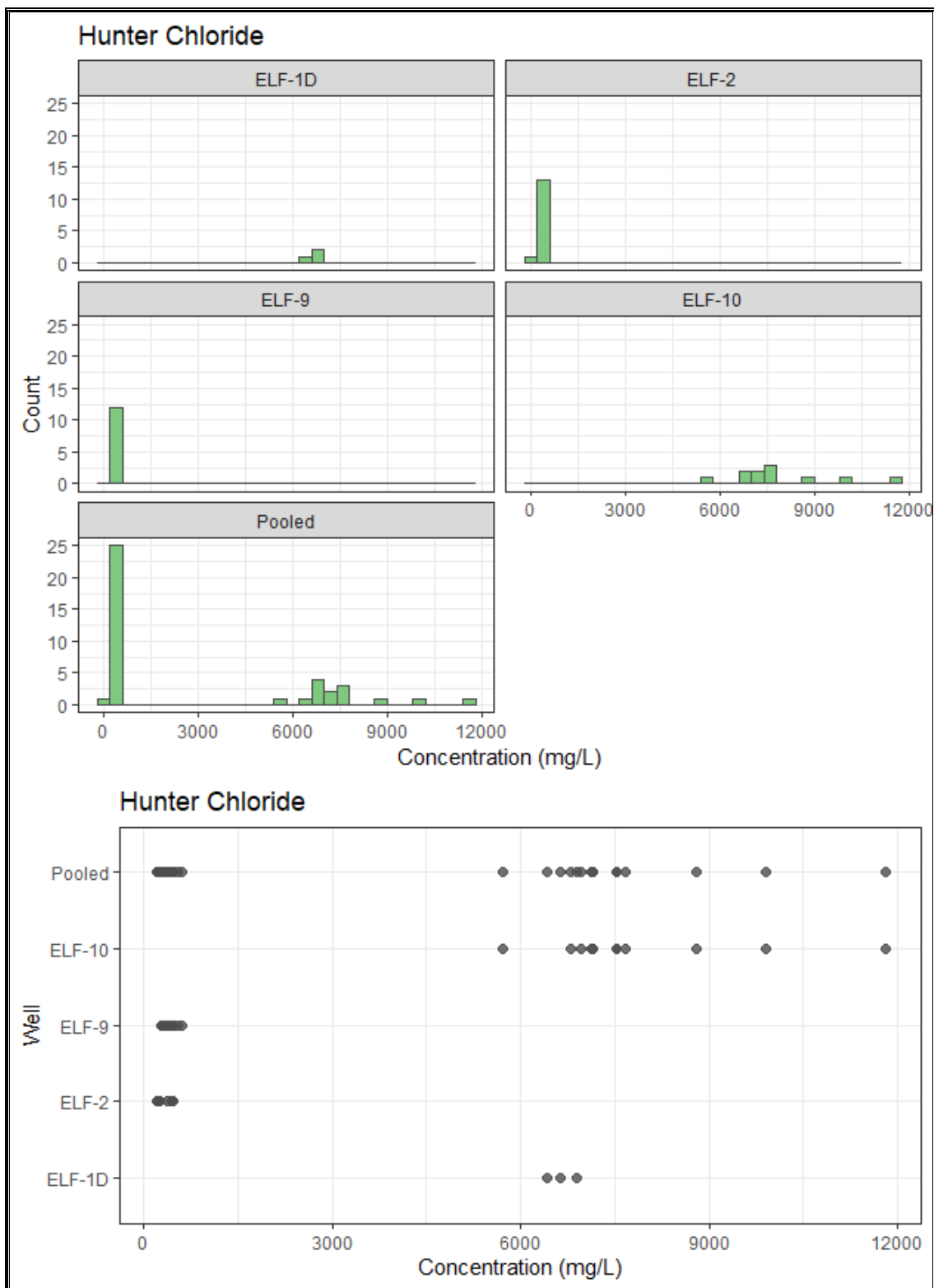


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

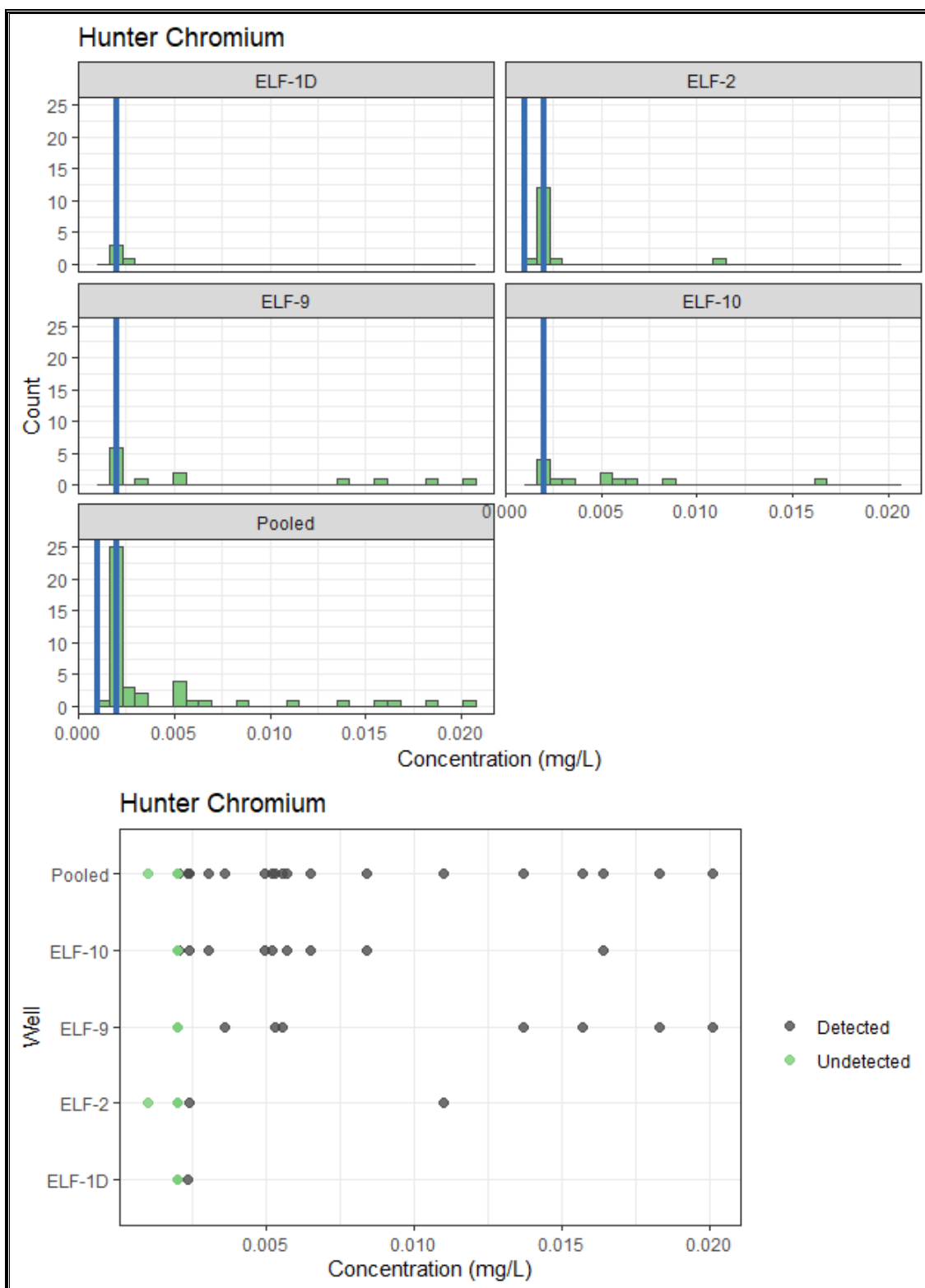


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

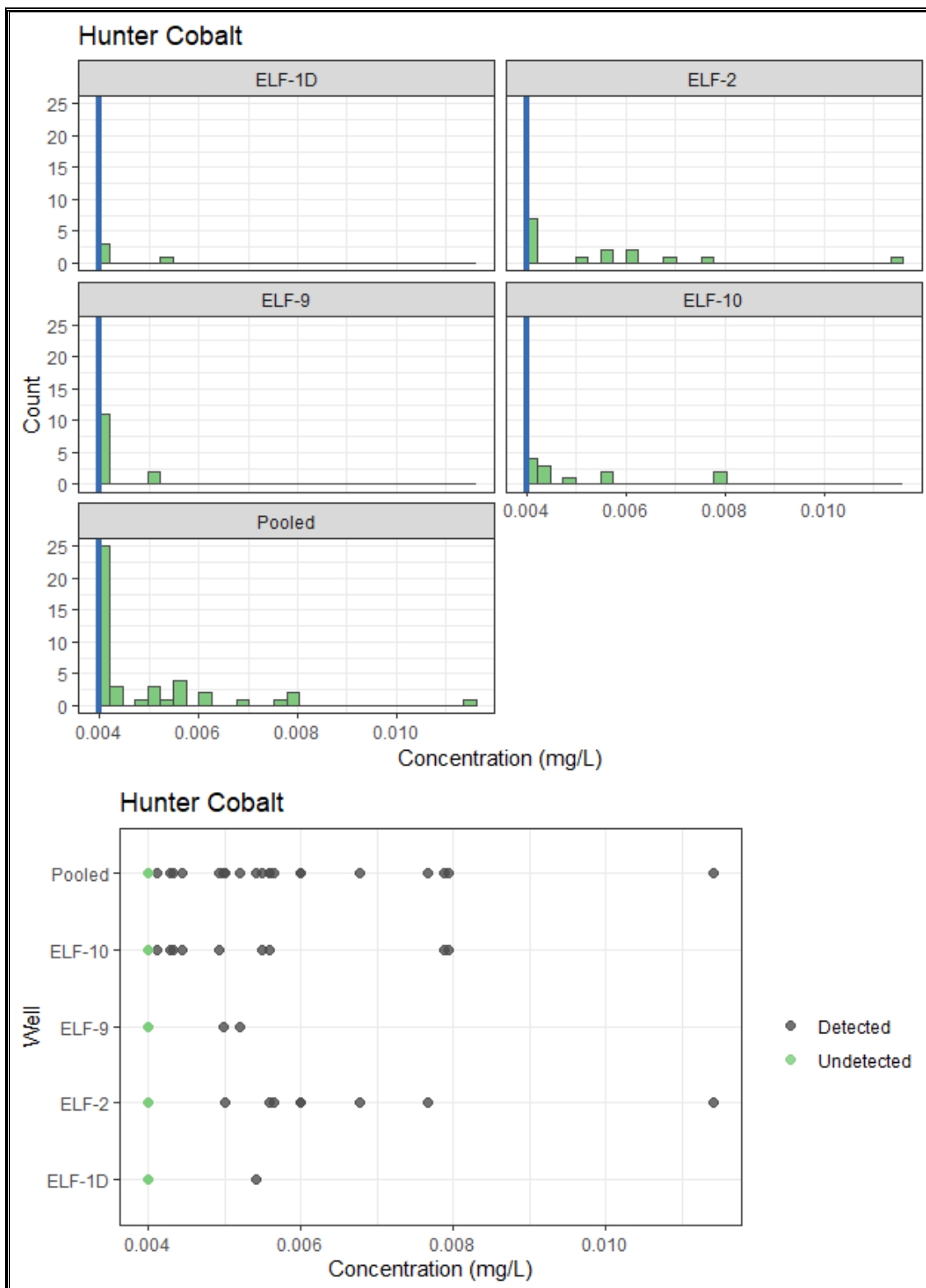


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

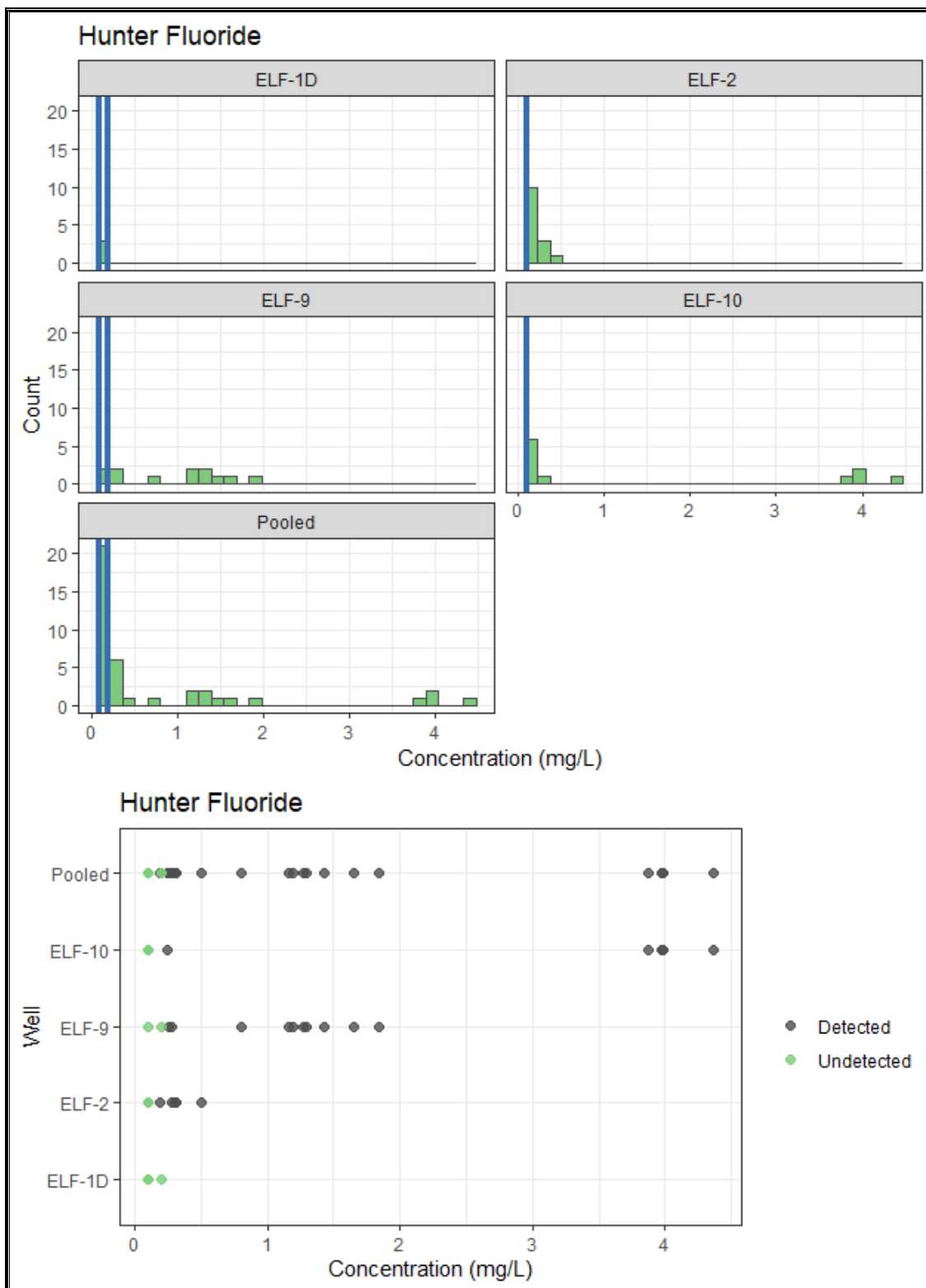


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

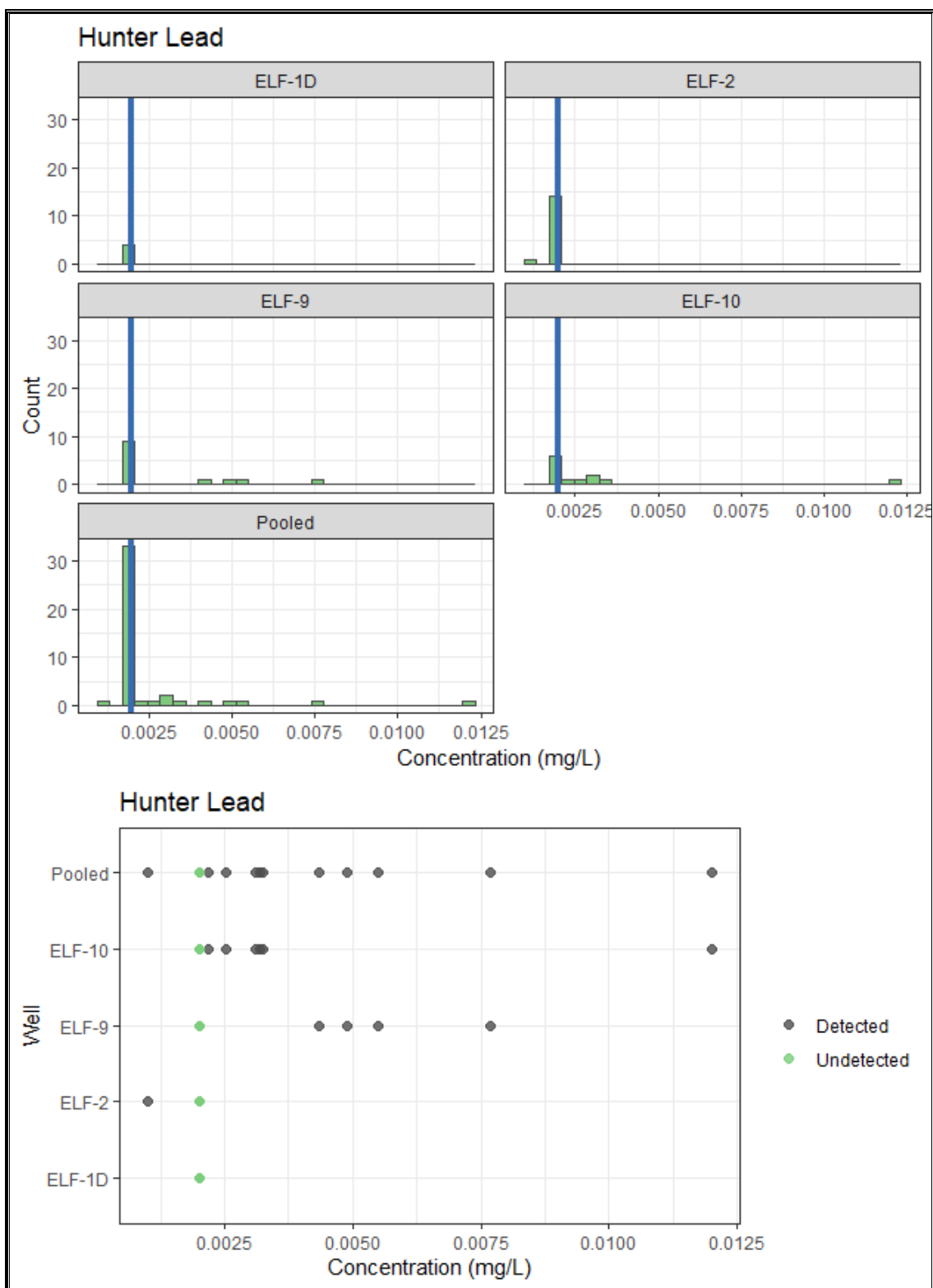


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

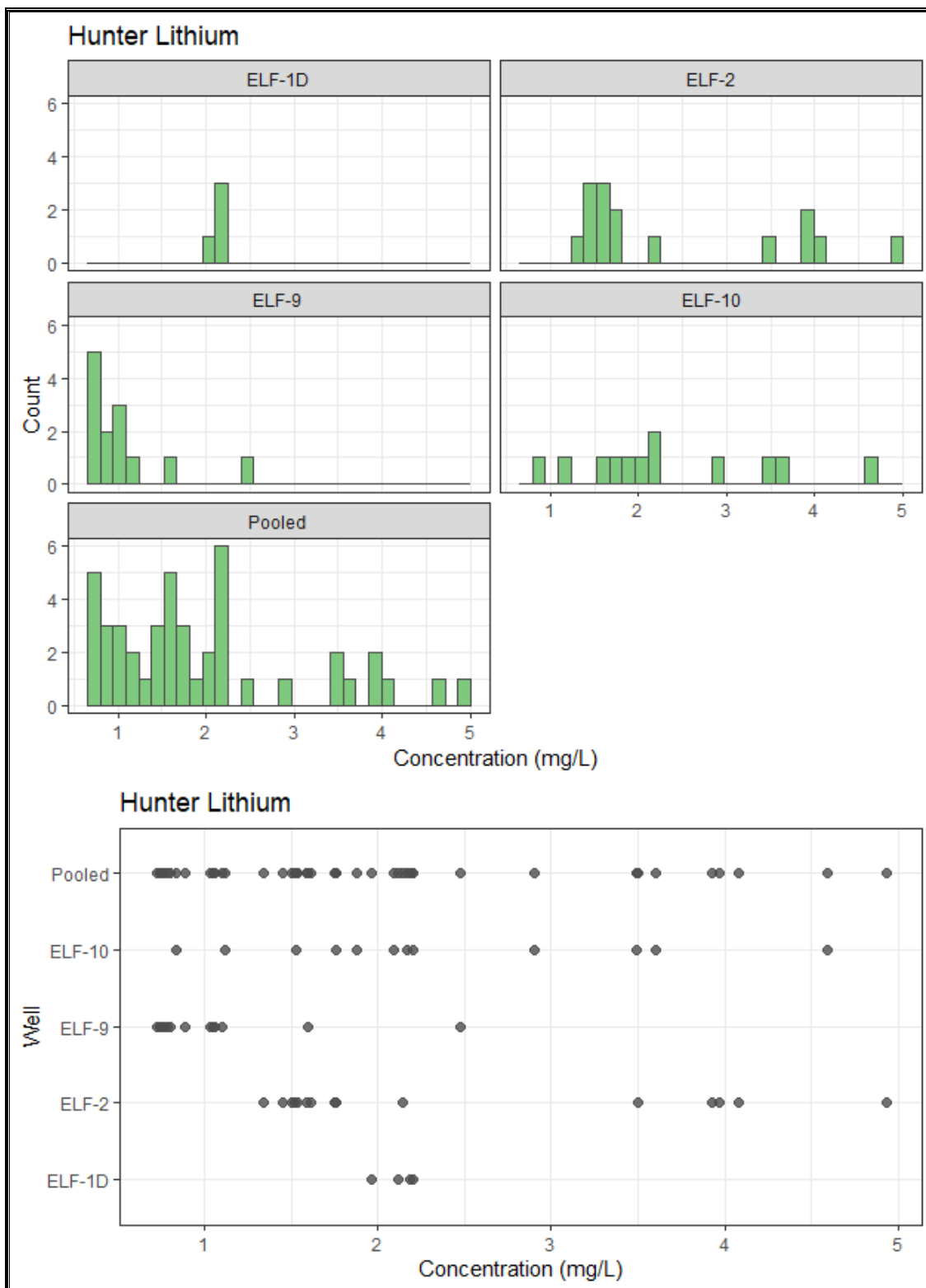


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

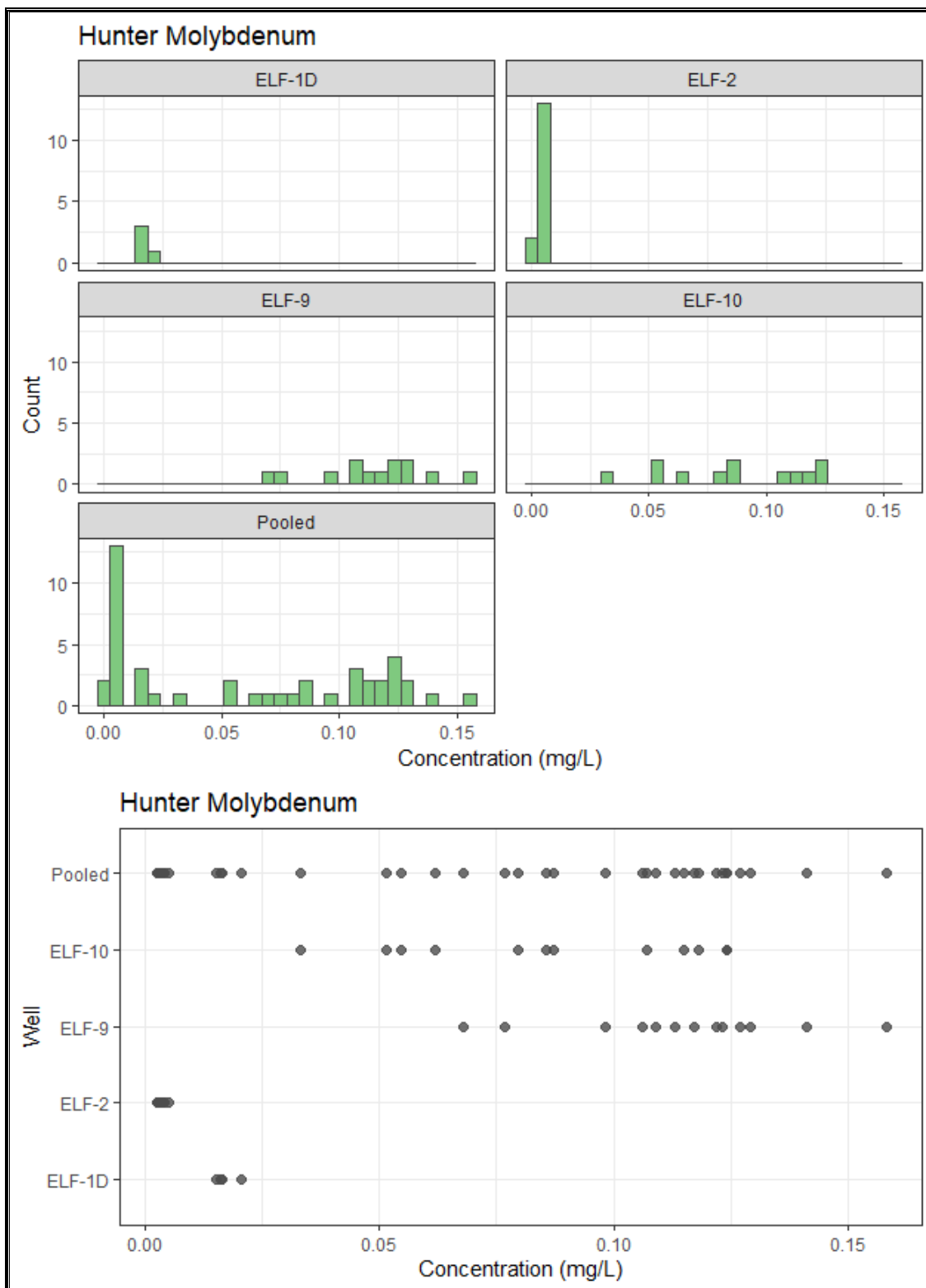


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

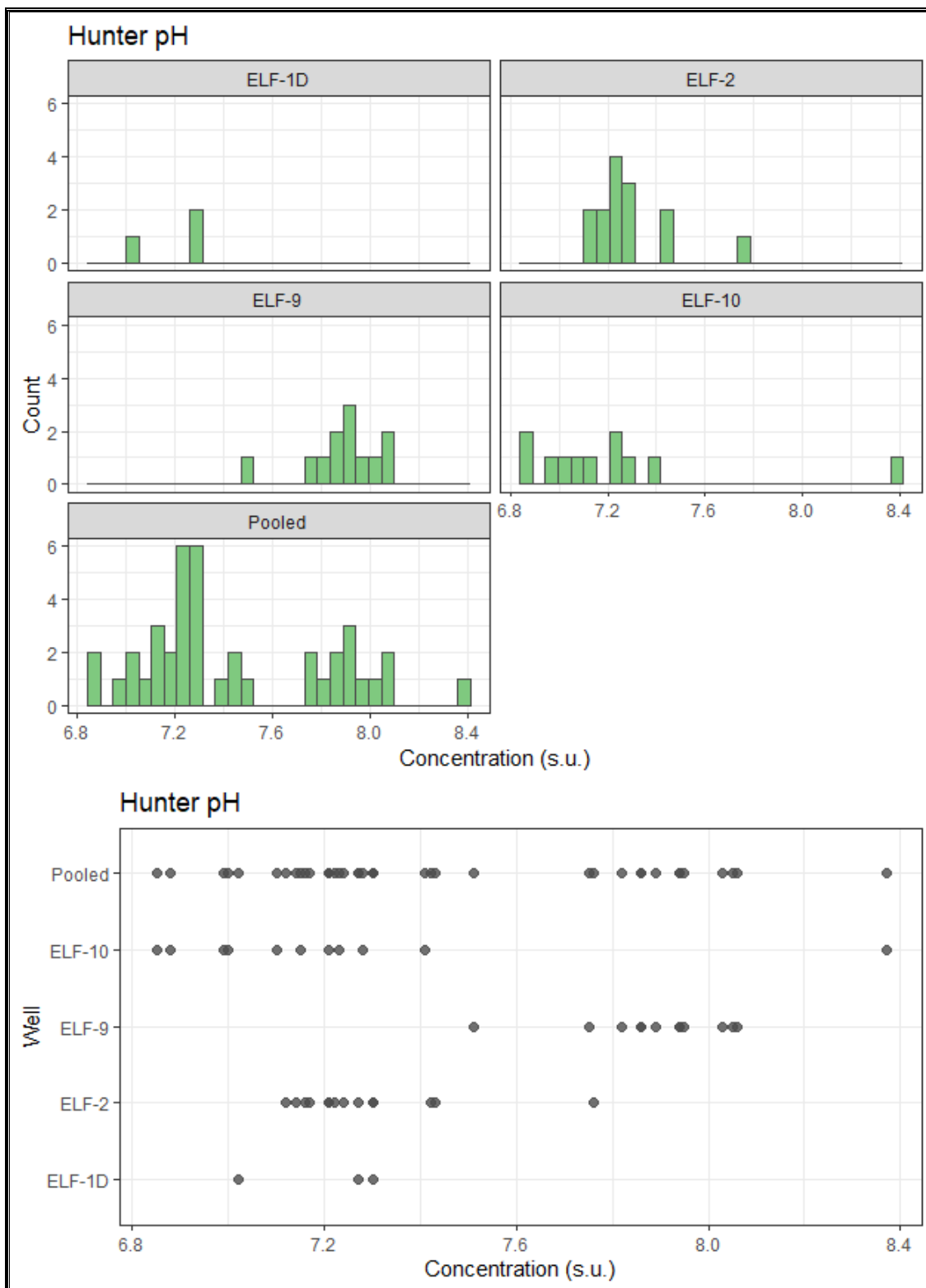


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

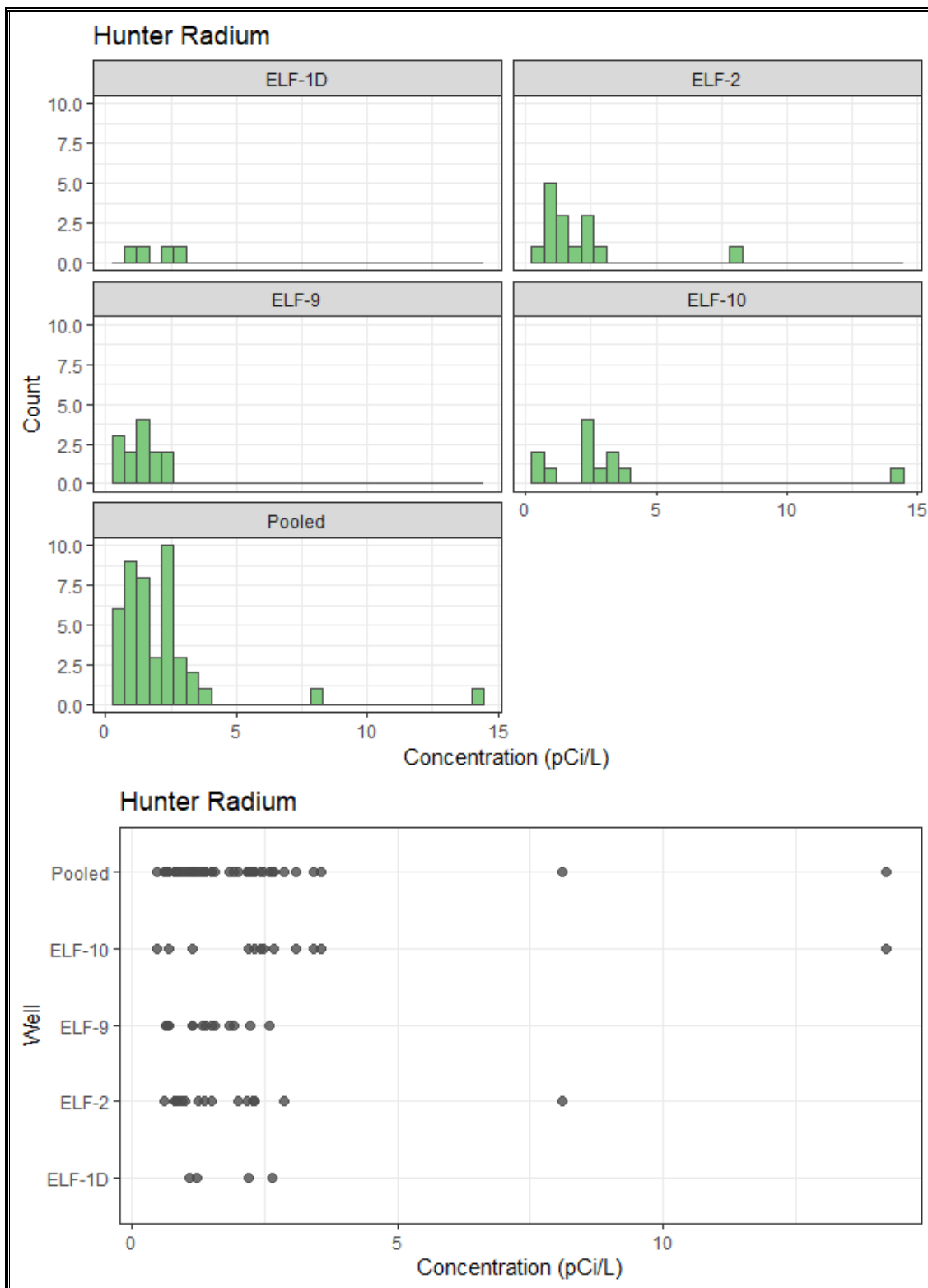


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

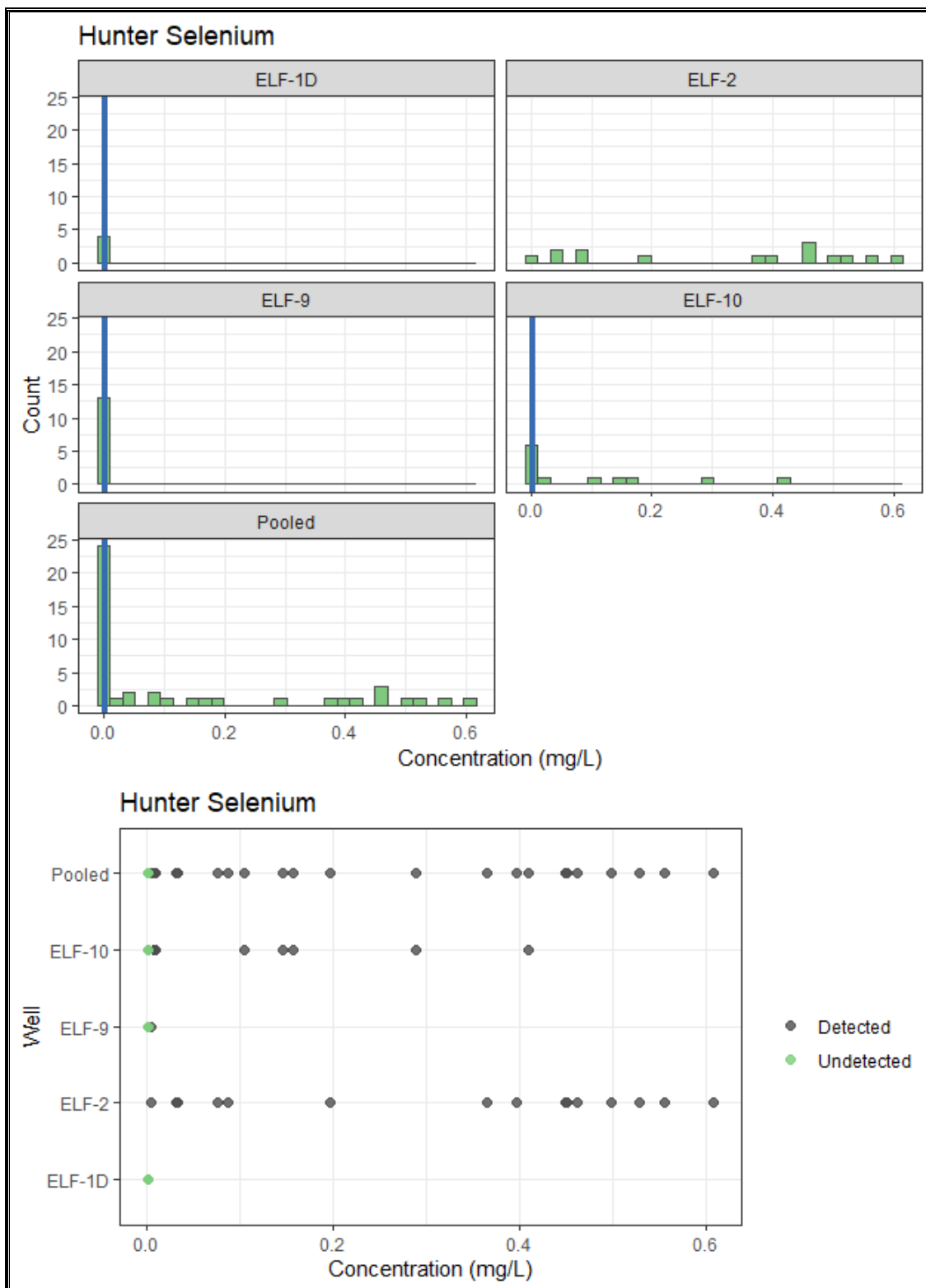


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

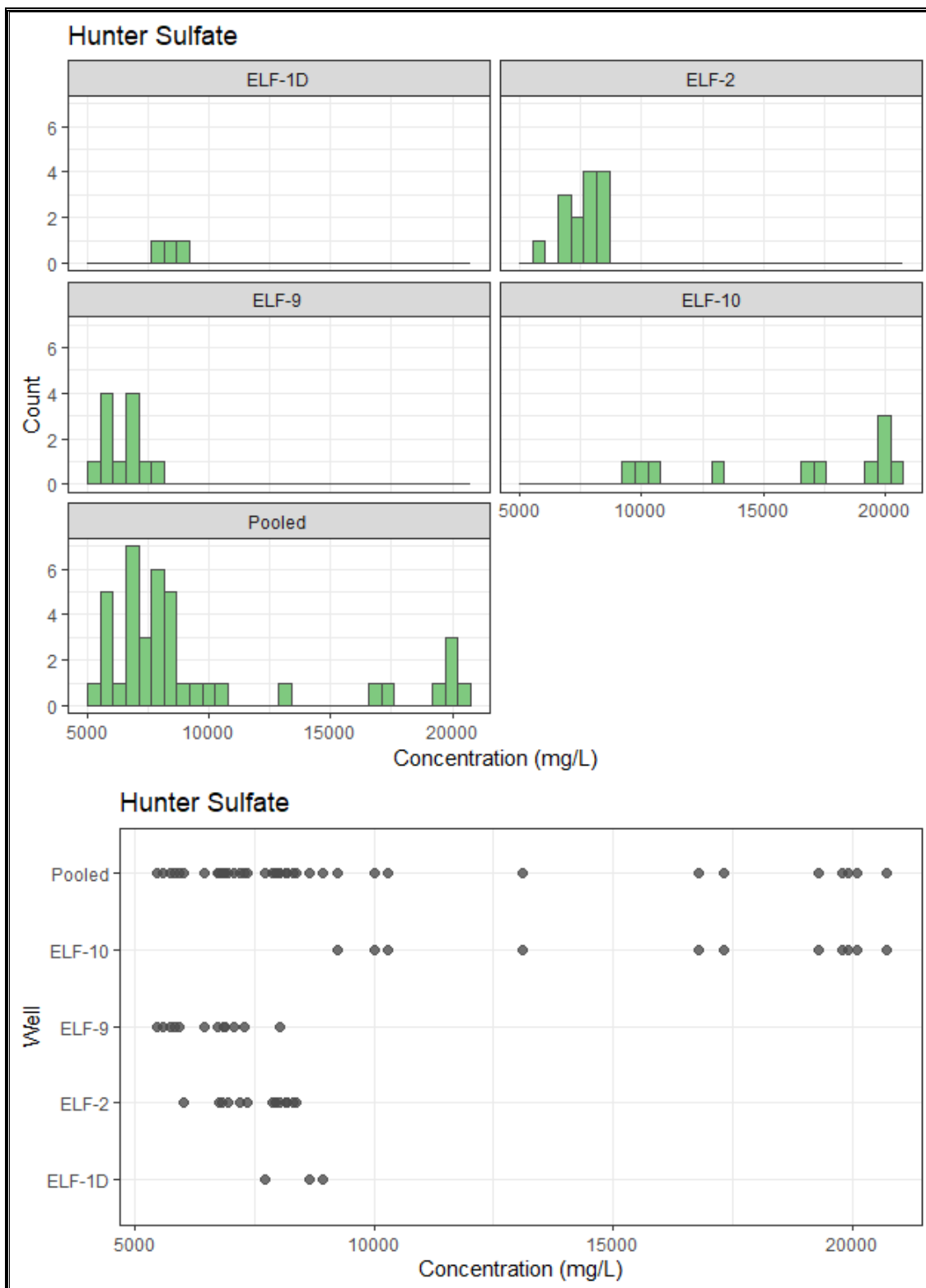


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

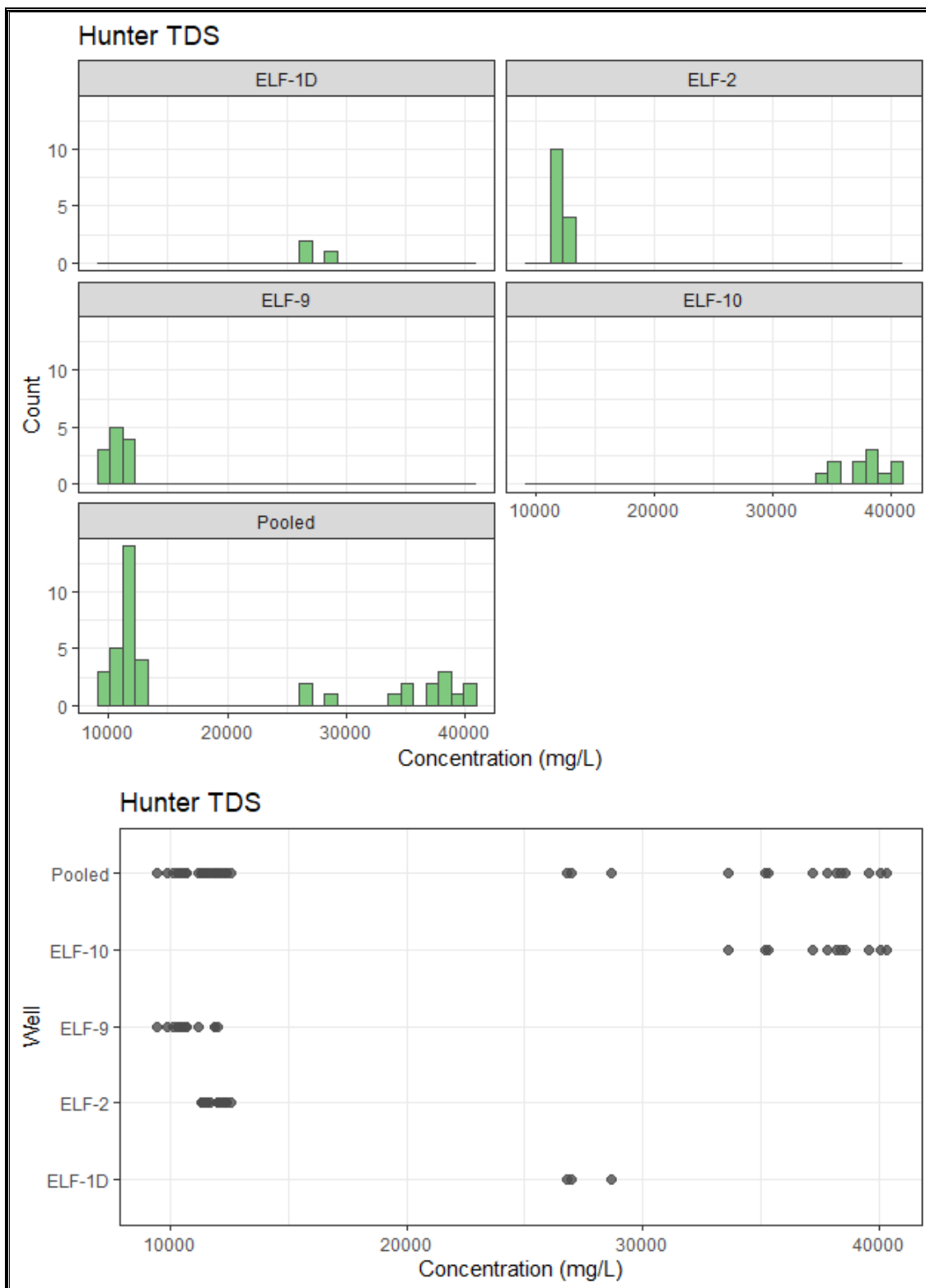


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

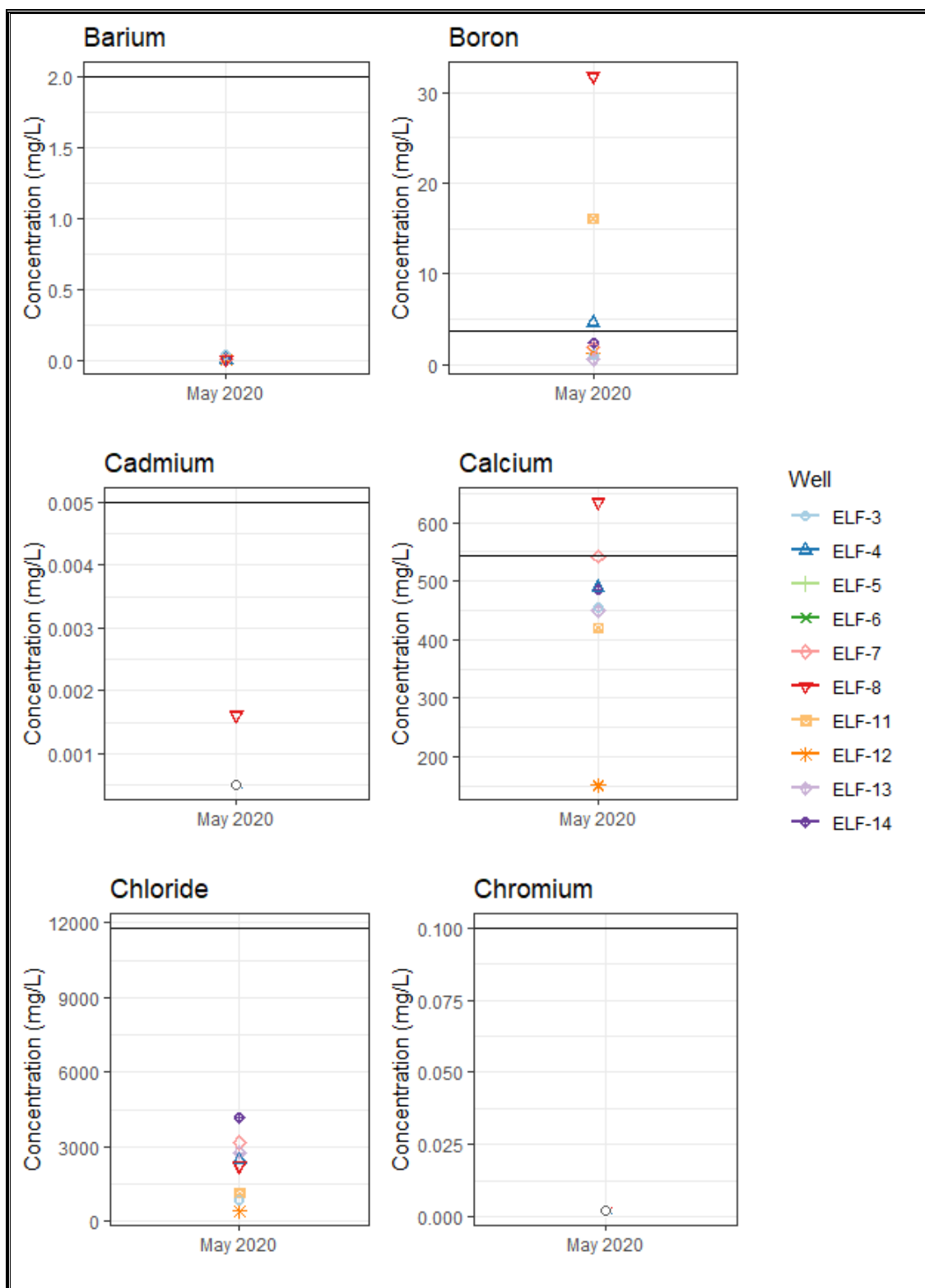


Figure C.4. Groundwater Protection Standard plots for the CCR Landfill.

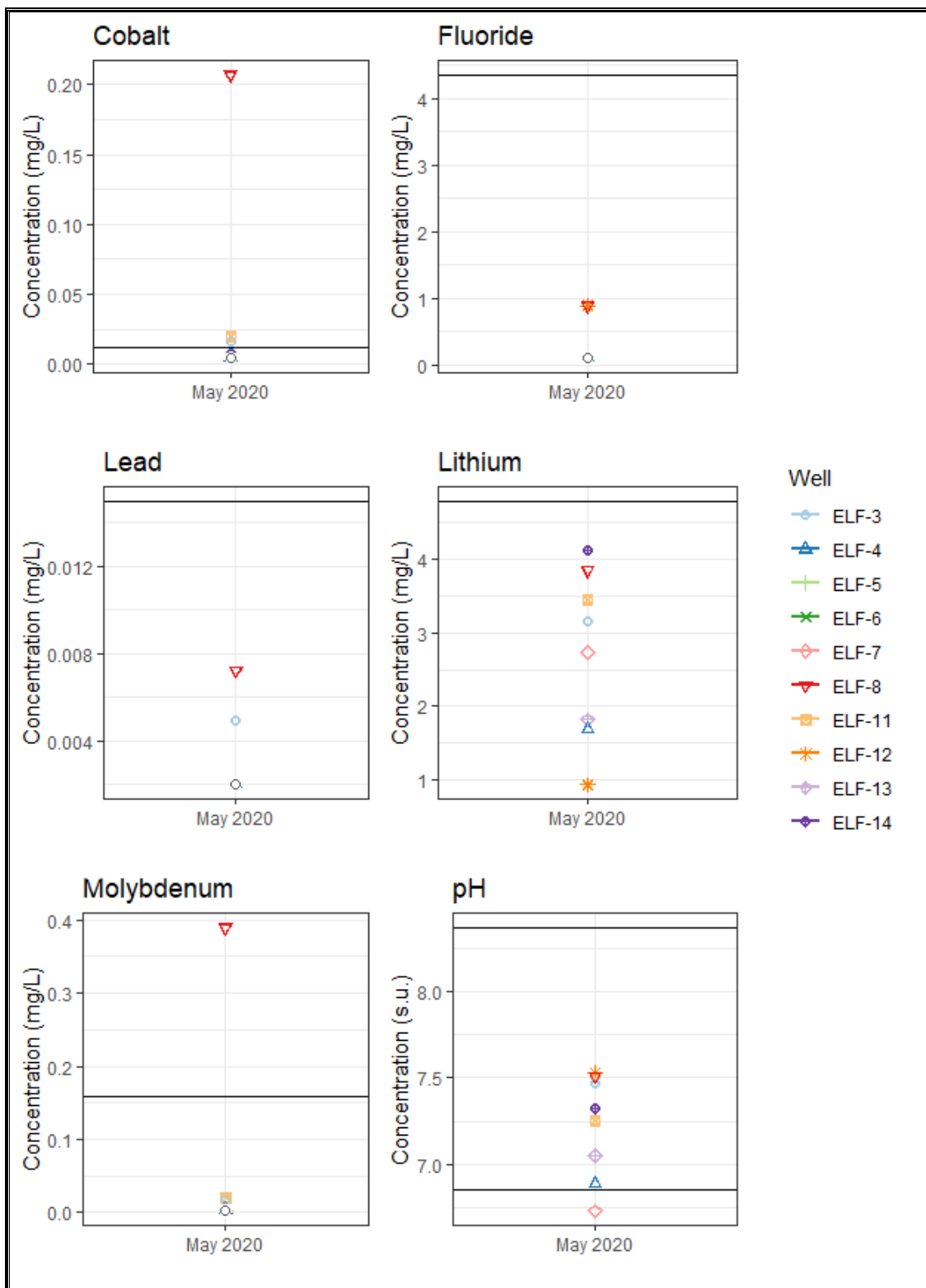


Figure C.4 (cont.). Groundwater Protection Standard plots for the CCR Landfill.

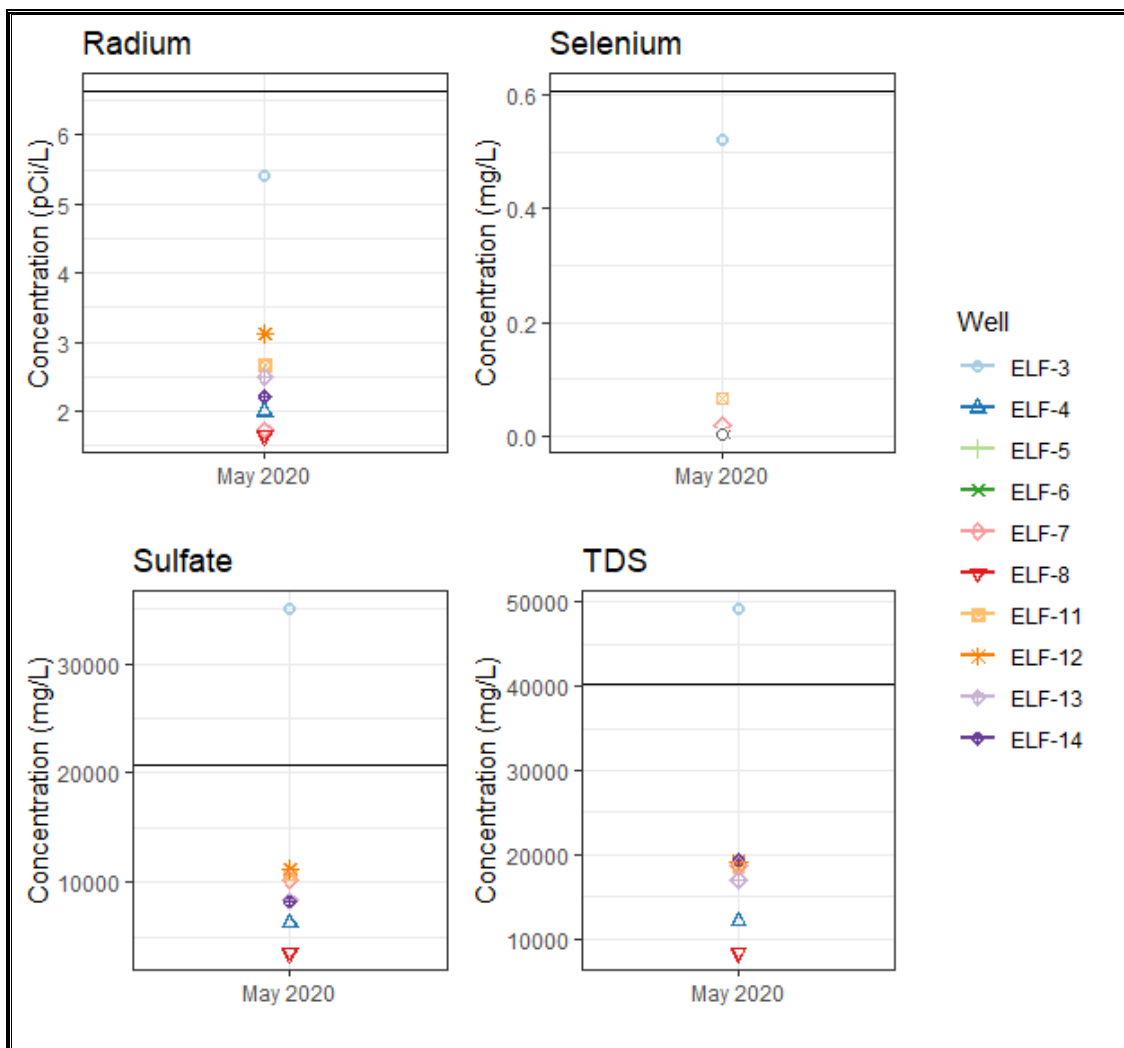


Figure C.4 (cont.). Groundwater Protection Standard plots for the CCR Landfill.

Attachment D:

Field Data Sheets



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

Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-1D	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Breezy, warm		
Depth to Water (ft):	83.89		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	19.80	36,561	3.02	6.73	222.00	9.36
5	19.10	36,650	2.89	6.65	213.40	10.50
10	19.40	36,416	2.90	6.67	215.80	44.30
20	19.00	36,527	2.87	6.63	210.80	127.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	11:30
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Final depth to water was below top of pump. Not all bottles filled, well would no longer produce water.



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Butte, Montana 59701
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Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-2	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Breezy, warm		
Depth to Water (ft):	23.22		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	14.00	14,265	1.34	6.55	209.40	1.39
5	13.90	14,223	0.71	6.58	204.20	6.54
10	13.50	14,264	0.44	6.57	198.90	3.14
10	14.00	14,239	0.25	6.60	193.70	2.43
15	14.30	14,266	0.18	6.58	195.00	2.67

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	10:45
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Final dtw, 0.0, top of pump.



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Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-3	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Warm		
Depth to Water (ft):	30.75		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	15.00	48,126	4.37	7.04	148.30	126.00
5	14.10	47,878	1.93	6.87	148.50	114.00
10	13.70	47,664	6.81	6.80	148.60	113.00
15	13.40	47,665	1.96	6.86	149.10	115.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	13:30
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Top of pump, final depth to water.



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Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-4	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	partly cloudy, 65°F, windy		
Depth to Water (ft):	17.34		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	15.08	15,300	188.00	7.01	208.00	0.00
5	14.69	15,400	1.30	7.01	209.00	0.00
10	14.62	15,400	1.28	7.00	209.00	0.00
15	14.59	15,400	1.26	7.00	209.00	0.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	11:15
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Not a lot of water but a good producer. Clearwater.



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Butte, Montana 59701
Phone: 406-782-5220
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Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-5	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	partly cloudy, 65°, windy		
Depth to Water (ft):	17.74		

FIELD PARAMETERS

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

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	10:40
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

No sample. Well went dry. Only able to bring trickle to surface then dry.



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Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-6	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Partly cloudy, windy		
Depth to Water (ft):	0.00		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	10:16
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

No water in well. Not able to sample. Pulled pump to check.



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 Fax: 406-723-1537

Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-7	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Mostly cloudy, 65°F, windy		
Depth to Water (ft):	15.80		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	16.66	23,200	1.76	6.96	215.00	51.90
5	14.30	23,300	5.43	6.95	215.00	21.90
10	14.21	23,300	5.33	6.94	215.00	21.70
15	14.26	23,300	5.40	6.93	215.00	22.60

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	12:05
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Had to remove pump to get a water level. Not able to get water level during stabilization process. Slow producer. yellow water



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 Butte, Montana 59701
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 Fax: 406-723-1537

Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-8	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Overcast, 63 F, light wind		
Depth to Water (ft):	8.94		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	13.60	11,600	1.77	7.46	255.00	11.60
5	12.87	11,600	1.24	7.49	248.00	1.80
10	12.90	11,600	1.17	7.51	240.00	0.00
15	12.91	11,600	1.15	7.51	243.00	0.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	09:45
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Good producer, clear



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 Butte, Montana 59701
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 Fax: 406-723-1537

Project Name:	HUNTER		
Sampler Initials:	DV	Project Number:	PERCM052
Sample ID:	ELF-9	Project Location:	
Water Disposal:	Ground	Sample Date:	5/13/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Mostly cloudy, 64°F, light wind		
Depth to Water (ft):	23.09		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	14.01	16,100	1.61	7.75	48.00	4.50
5	13.92	15,500	1.12	7.75	23.00	0.00
10	13.95	15,400	1.11	7.75	20.00	0.00
15	13.91	15,300	1.14	7.77	18.00	0.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	13:00
------------------	-----	---------------------	-------

Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Deeper well plenty of water. Good producer.



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

Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-10	Project Location:	
Water Disposal:	Ground	Sample Date:	5/12/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Breezy		
Depth to Water (ft):	49.21		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	15.39	47,700	1.57	6.79	163.00	156.00
5	15.20	47,700	1.25	6.79	160.00	136.00
10	15.10	47,600	1.10	6.78	158.00	47.70

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	20:20
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Did not stabilize, poor producer, DO dropped with time. Final depth to water top of pump.



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

Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-11	Project Location:	
Water Disposal:	Ground	Sample Date:	5/12/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Sunny,		
Depth to Water (ft):	28.11		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	16.39	19,300	2.58	7.20	170.00	180.00
5	16.82	19,000	1.60	7.18	170.00	206.00
10	17.07	18,900	1.46	7.17	168.00	156.00
15	17.09	19,000	1.58	7.16	167.00	117.00

SAMPLE COLLECTION			
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Appendix:	3_4	Sample Time:	17:30
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

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

Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-12	Project Location:	
Water Disposal:	Ground	Sample Date:	5/12/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Breezy		
Depth to Water (ft):	20.15		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	14.75	22,300	1.02	7.42	34.00	116.00
5	14.65	22,400	0.88	7.42	27.00	77.00
10	14.71	22,400	0.82	7.42	20.00	49.30
15	14.75	22,400	0.78	7.43	12.00	47.00
20	14.44	22,400	0.78	7.43	12.00	30.00

SAMPLE COLLECTION			
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Appendix:	3_4	Sample Time:	19:20
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

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

Project Name:	HUNTER		
Sampler Initials:	MLS	Project Number:	PERCM052
Sample ID:	ELF-13	Project Location:	
Water Disposal:	Ground	Sample Date:	5/12/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	OVERCAST, WINDY		
Depth to Water (ft):	3.52		

FIELD PARAMETERS

TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	13.46	20,200	2.19	6.96	189.00	15.60
2	12.48	20,500	1.33	6.95	192.00	6.20
10	12.50	20,700	1.15	6.96	194.00	0.00
15	12.47	20,800	1.20	6.96	195.00	0.00
20	12.53	20,800	1.15	6.96	196.00	0.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	18:45
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:



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

Project Name:	HUNTER		
Sampler Initials:	Bg	Project Number:	PERCM052
Sample ID:	ELF-14	Project Location:	
Water Disposal:	Ground	Sample Date:	5/12/2020
Sample Method:	Low Flow Bladder Pump	Decon Method:	Dedicated Equipment
Field Conditions:	Breezy		
Depth to Water (ft):	6.48		

FIELD PARAMETERS						
TIME (min)	TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	Turb. (NTU)
0	13.45	24	1.65	7.17	89.00	203.00
5	13.09	24	1.12	7.17	94.00	112.00
10	13.05	24	0.99	7.16	99.00	65.00
15	13.07	24	0.91	7.16	103.00	67.50
20	12.98	24	0.87	7.14	107.00	68.00

SAMPLE COLLECTION

Appendix:	3_4	Sample Time:	18:00
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Containers	Preservatives	Analytes/Comments
(1) 1/2 gal poly	HNO3	Radium 226 + 228
(1) 250 mL poly	HNO3	Total metals, Total mercury
(1) 250 mL poly	H2SO4	Nitrate + Nitrite
(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

Comments/Observations:

Group B - Dup taken here

Attachment E:

Laboratory Analytical Reports



Jeff Tucker
PacifiCorp
1407 West North Temple, # 280
Salt Lake City, UT 84116
TEL: (801) 220-2989

RE: Hunter CCR Groundwater Sampling / PERCM052

Dear Jeff Tucker:

Lab Set ID: 2005382

3440 South 700 West
Salt Lake City, UT 84119

American West Analytical Laboratories received sample(s) on 5/15/2020 for the analyses presented in the following report.

Phone: (801) 263-8686
Toll Free: (888) 263-8686
Fax: (801) 263-8687
e-mail: awal@awal-labs.com
web: www.awal-labs.com

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Approved by:

Digitally signed
by Jose G.
Rocha
Date: 2020.06.10
16:56:28 -06'00'

Laboratory Director or designee

Sample(s) were subcontracted for the following analyses:

Radiological Testing



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-001
Client Sample ID: ELF-10
Collection Date: 5/12/2020 2020h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	0.0145	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1218h	E200.7	0.500	1.59	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1234h	E200.7	10.0	474	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	0.00303	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00400	0.00432	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/2/2020 1218h	E200.7	0.100	2.90	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1735h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	0.0331	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	0.00234	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1257h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-002
Client Sample ID: ELF-11
Collection Date: 5/12/2020 1730h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	0.0138	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/1/2020 1237h	E200.7	5.00	16.1	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1237h	E200.7	10.0	420	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00400	0.0198	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1237h	E200.7	1.00	3.44	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1742h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	0.0200	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	0.0663	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1300h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-003
Client Sample ID: ELF-12
Collection Date: 5/12/2020 1920h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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 e-mail: awal@awal-labs.com
 web: www.awal-labs.com

Kyle F. Gross
 Laboratory Director

Jose Rocha
 QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	0.00994	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1221h	E200.7	0.500	1.32	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1240h	E200.7	10.0	151	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00400	< 0.00400	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/2/2020 1221h	E200.7	0.100	0.937	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1752h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1304h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-004
Client Sample ID: ELF-13
Collection Date: 5/12/2020 1850h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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 web: www.awal-labs.com

Kyle F. Gross
 Laboratory Director

Jose Rocha
 QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	0.00968	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1223h	E200.7	0.500	0.536	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1242h	E200.7	10.0	449	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00400	< 0.00400	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1242h	E200.7	1.00	1.82	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1754h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1307h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-005
Client Sample ID: ELF-14
Collection Date: 5/12/2020 1800h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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e-mail: awal@awal-labs.com
web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	0.0102	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1226h	E200.7	0.500	2.32	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1245h	E200.7	10.0	486	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00400	0.00728	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1245h	E200.7	1.00	4.12	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1756h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	0.00389	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	0.00296	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1311h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-006
Client Sample ID: ELF-1D
Collection Date: 5/13/2020 1130h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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e-mail: awal@awal-labs.com
web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	0.0103	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1229h	E200.7	0.500	2.10	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1255h	E200.7	10.0	353	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00400	< 0.00400	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1255h	E200.7	1.00	1.96	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1758h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	0.0153	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1314h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-007
Client Sample ID: ELF-2
Collection Date: 5/13/2020 1045h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Laboratory Director

Jose Rocha
QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	0.0104	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1232h	E200.7	0.500	3.38	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1258h	E200.7	10.0	398	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00400	0.00600	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1258h	E200.7	1.00	1.59	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1800h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	0.00279	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	0.00566	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1318h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-008
Client Sample ID: ELF-3
Collection Date: 5/13/2020 1330h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Jose Rocha
 QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	0.0405	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1243h	E200.7	0.500	1.08	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1301h	E200.7	10.0	455	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	0.00220	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00400	0.0159	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	0.00491	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1301h	E200.7	1.00	3.16	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1806h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	0.0172	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	0.521	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1321h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-009
Client Sample ID: ELF-4
Collection Date: 5/13/2020 1115h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	0.0104	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1246h	E200.7	0.500	4.60	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1303h	E200.7	10.0	489	
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00400	0.00553	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1303h	E200.7	1.00	1.69	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1808h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	0.00456	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1352h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-010
Client Sample ID: ELF-7
Collection Date: 5/13/2020 1205h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	< 0.00200	
Barium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	0.00995	
Beryllium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/3/2020 1415h	E200.7	0.500	1.84	
Cadmium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/3/2020 1519h	E200.7	20.0	542	
Chromium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00400	< 0.00400	
Lead	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/3/2020 1415h	E200.7	0.100	2.73	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1810h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	0.00371	
Selenium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	0.0205	
Thallium	mg/L	6/1/2020 1025h	6/1/2020 1545h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-011
Client Sample ID: ELF-8
Collection Date: 5/13/2020 945h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	< 0.00200	
Barium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	0.0111	
Beryllium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/3/2020 1418h	E200.7	5.00	31.8	
Cadmium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.000500	0.00162	
Calcium	mg/L	5/29/2020 1625h	6/3/2020 1517h	E200.7	20.0	635	
Chromium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00400	0.207	
Lead	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	0.00724	
Lithium	mg/L	5/29/2020 1625h	6/3/2020 1418h	E200.7	1.00	3.85	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1812h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	0.390	
Selenium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	6/1/2020 1025h	6/1/2020 1520h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-012
Client Sample ID: ELF-9
Collection Date: 5/13/2020 1300h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	0.00725	
Barium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	0.0128	
Beryllium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/3/2020 1354h	E200.7	0.500	1.49	
Cadmium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/3/2020 1354h	E200.7	1.00	57.1	
Chromium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00400	< 0.00400	
Lead	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/3/2020 1354h	E200.7	0.100	1.06	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1814h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	0.0768	
Selenium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	6/1/2020 1025h	6/1/2020 1537h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-013
Client Sample ID: Group B - DUP
Collection Date: 5/12/2020
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	< 0.00200	
Barium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	0.0101	
Beryllium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/2/2020 1257h	E200.7	0.500	2.42	
Cadmium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/1/2020 1306h	E200.7	10.0	487	²
Chromium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00400	0.00700	
Lead	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/1/2020 1306h	E200.7	1.00	4.08	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1816h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	0.00377	
Selenium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	0.00297	
Thallium	mg/L	5/29/2020 1625h	6/1/2020 1335h	E200.8	0.00200	< 0.00200	

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-014
Client Sample ID: Group B - Blank
Collection Date: 5/13/2020 1120h
Received Date: 5/15/2020 1426h

Analytical Results

TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Barium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Beryllium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Boron	mg/L	5/29/2020 1625h	6/3/2020 1420h	E200.7	0.500	< 0.500	
Cadmium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	5/29/2020 1625h	6/3/2020 1420h	E200.7	1.00	< 1.00	
Chromium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00400	< 0.00400	
Lead	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	5/29/2020 1625h	6/3/2020 1420h	E200.7	0.100	< 0.100	
Mercury	mg/L	5/18/2020 1242h	5/29/2020 1818h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Selenium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	6/1/2020 1025h	6/1/2020 1541h	E200.8	0.00200	< 0.00200	



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-001
Client Sample ID: ELF-10
Collection Date: 5/12/2020 2020h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1338h	E300.0	200	11,800	
Fluoride	mg/L		5/22/2020 1946h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1616h	SM4500-H+B	1.00	6.85	H
Sulfate	mg/L		5/22/2020 1338h	E300.0	1,500	9,230	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	33,600	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-002
Client Sample ID: ELF-11
Collection Date: 5/12/2020 1730h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1355h	E300.0	100	1,140	
Fluoride	mg/L		5/22/2020 2003h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1616h	SM4500-H+B	1.00	7.25	H
Sulfate	mg/L		5/22/2020 1355h	E300.0	750	10,700	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	18,500	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-003
Client Sample ID: ELF-12
Collection Date: 5/12/2020 1920h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1412h	E300.0	200	414	
Fluoride	mg/L		5/29/2020 1325h	SM4500-F-C	0.100	0.896	
pH @ 25° C	pH Units		5/15/2020 1616h	SM4500-H+B	1.00	7.53	H
Sulfate	mg/L		5/22/2020 1412h	E300.0	1,500	11,200	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	19,200	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-004
Client Sample ID: ELF-13
Collection Date: 5/12/2020 1850h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1428h	E300.0	100	2,770	
Fluoride	mg/L		5/22/2020 2037h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1616h	SM4500-H+B	1.00	7.05	H
Sulfate	mg/L		5/22/2020 1428h	E300.0	750	8,300	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	17,000	

H - Sample was received outside of the holding time.

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Laboratory Director

Jose Rocha
QA Officer



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-005
Client Sample ID: ELF-14
Collection Date: 5/12/2020 1800h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1519h	E300.0	100	4,160	
Fluoride	mg/L		5/22/2020 2053h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.32	H
Sulfate	mg/L		5/22/2020 1519h	E300.0	750	8,220	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	19,400	

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-006
Client Sample ID: ELF-1D
Collection Date: 5/13/2020 1130h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1609h	E300.0	100	6,640	
Fluoride	mg/L		5/22/2020 2110h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.30	H
Sulfate	mg/L		5/22/2020 1609h	E300.0	750	8,940	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	500	28,700	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-007
Client Sample ID: ELF-2
Collection Date: 5/13/2020 1045h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1659h	E300.0	100	197	
Fluoride	mg/L		5/22/2020 2127h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.27	H
Sulfate	mg/L		5/22/2020 1659h	E300.0	750	6,830	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	12,000	

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-008
Client Sample ID: ELF-3
Collection Date: 5/13/2020 1330h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1716h	E300.0	500	840	
Fluoride	mg/L		5/22/2020 2144h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.47	H
Sulfate	mg/L		5/22/2020 1716h	E300.0	3,750	35,100	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	500	49,300	

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-009
Client Sample ID: ELF-4
Collection Date: 5/13/2020 1115h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1732h	E300.0	50.0	2,470	
Fluoride	mg/L		5/22/2020 2200h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	6.89	H
Sulfate	mg/L		5/22/2020 1732h	E300.0	375	6,260	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	12,100	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-010
Client Sample ID: ELF-7
Collection Date: 5/13/2020 1205h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1749h	E300.0	100	3,160	
Fluoride	mg/L		5/22/2020 2217h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	6.73	H
Sulfate	mg/L		5/22/2020 1749h	E300.0	750	10,200	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	18,700	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-011
Client Sample ID: ELF-8
Collection Date: 5/13/2020 945h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1806h	E300.0	50.0	2,250	
Fluoride	mg/L		5/27/2020 1107h	E300.0	0.200	0.885	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.51	H
Sulfate	mg/L		5/22/2020 1806h	E300.0	375	3,540	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	8,340	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-012
Client Sample ID: ELF-9
Collection Date: 5/13/2020 1300h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1823h	E300.0	100	595	
Fluoride	mg/L		5/27/2020 1158h	E300.0	0.200	0.799	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.82	H
Sulfate	mg/L		5/22/2020 1823h	E300.0	750	7,280	
Total Dissolved Solids	mg/L		6/4/2020 1120h	SM2540C	500	9,900	H*

H - Sample was received outside of the holding time.

H - The original analysis performed within the holding time yielded an anomalous result; thus, the sample was reanalyzed outside the holding time.*

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-013
Client Sample ID: Group B - DUP
Collection Date: 5/12/2020
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1839h	E300.0	200	4,370	
Fluoride	mg/L		5/22/2020 2342h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/15/2020 1647h	SM4500-H+B	1.00	7.20	H
Sulfate	mg/L		5/22/2020 1839h	E300.0	1,500	8,710	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	100	19,400	

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter CCR Groundwater Sampling / PERCM052
Lab Sample ID: 2005382-014
Client Sample ID: Group B - Blank
Collection Date: 5/13/2020 1120h
Received Date: 5/15/2020 1426h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		5/22/2020 1856h	E300.0	0.100	< 0.100	
Fluoride	mg/L		5/22/2020 1856h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		5/18/2020 1252h	SM4500-H+B	1.00	5.64	H
Sulfate	mg/L		5/22/2020 1856h	E300.0	0.750	< 0.750	
Total Dissolved Solids	mg/L		5/18/2020 1200h	SM2540C	10.0	80.0	

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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: LCS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	LCS-70137	Date Analyzed:	06/01/2020 1231h											
Test Code:	200.7-W	Date Prepared:	05/29/2020 1625h											
Boron		1.09	mg/L	E200.7	0.0449	0.500	1.000	0	109	85 - 115				
Calcium		9.63	mg/L	E200.7	0.211	1.00	10.00	0	96.3	85 - 115				
Lithium		1.03	mg/L	E200.7	0.0207	0.100	1.000	0	103	80 - 120				
Lab Sample ID:	LCS-70111	Date Analyzed:	06/01/2020 1253h											
Test Code:	200.8-W	Date Prepared:	05/29/2020 1625h											
Antimony		0.182	mg/L	E200.8	0.000734	0.00400	0.2000	0	91.1	85 - 115				
Arsenic		0.195	mg/L	E200.8	0.000298	0.00200	0.2000	0	97.4	85 - 115				
Barium		0.188	mg/L	E200.8	0.000544	0.00200	0.2000	0	93.9	85 - 115				
Beryllium		0.195	mg/L	E200.8	0.000198	0.00200	0.2000	0	97.7	85 - 115				
Cadmium		0.193	mg/L	E200.8	0.0000742	0.000500	0.2000	0	96.5	85 - 115				
Chromium		0.189	mg/L	E200.8	0.00191	0.00200	0.2000	0	94.6	85 - 115				
Cobalt		0.197	mg/L	E200.8	0.000300	0.00400	0.2000	0	98.3	85 - 115				
Lead		0.195	mg/L	E200.8	0.000448	0.00200	0.2000	0	97.3	85 - 115				
Molybdenum		0.199	mg/L	E200.8	0.000652	0.00200	0.2000	0	99.5	85 - 115				
Selenium		0.191	mg/L	E200.8	0.000508	0.00200	0.2000	0	95.3	85 - 115				
Thallium		0.189	mg/L	E200.8	0.000390	0.00200	0.2000	0	94.7	85 - 115				
Lab Sample ID:	LCS-70161	Date Analyzed:	06/01/2020 1517h											
Test Code:	200.8-W	Date Prepared:	06/01/2020 1025h											
Antimony		0.184	mg/L	E200.8	0.000734	0.00400	0.2000	0	92.1	85 - 115				
Arsenic		0.197	mg/L	E200.8	0.000298	0.00200	0.2000	0	98.6	85 - 115				
Barium		0.185	mg/L	E200.8	0.000544	0.00200	0.2000	0	92.7	85 - 115				
Beryllium		0.197	mg/L	E200.8	0.000198	0.00200	0.2000	0	98.6	85 - 115				
Cadmium		0.192	mg/L	E200.8	0.0000742	0.000500	0.2000	0	96.0	85 - 115				
Chromium		0.195	mg/L	E200.8	0.00191	0.00200	0.2000	0	97.4	85 - 115				
Cobalt		0.202	mg/L	E200.8	0.000300	0.00400	0.2000	0	101	85 - 115				
Lead		0.199	mg/L	E200.8	0.000448	0.00200	0.2000	0	99.5	85 - 115				
Molybdenum		0.198	mg/L	E200.8	0.000652	0.00200	0.2000	0	99.1	85 - 115				
Selenium		0.191	mg/L	E200.8	0.000508	0.00200	0.2000	0	95.7	85 - 115				

Report Date: 6/10/2020 Page 30 of 43

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Laboratory Director

Jose Rocha

QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: LCS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: LCS-70161	Date Analyzed:	06/01/2020	1517h										
Test Code:	200.8-W	Date Prepared:	06/01/2020	1025h									
Thallium	0.193	mg/L	E200.8	0.000390	0.00200	0.2000	0	96.6	85 - 115				
Lab Sample ID: LCS-70109	Date Analyzed:	05/29/2020	1733h										
Test Code:	HG-DW-245.1	Date Prepared:	05/18/2020	1242h									
Mercury	0.00323	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	96.8	85 - 115				



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QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MBLK

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: MB-70137	Date Analyzed:	06/01/2020 1229h											
Test Code:	200.7-W	Date Prepared:	05/29/2020 1625h										
Boron	< 0.500	mg/L	E200.7	0.0449	0.500								
Calcium	< 1.00	mg/L	E200.7	0.211	1.00								
Lithium	< 0.100	mg/L	E200.7	0.0207	0.100								
Lab Sample ID: MB-70111	Date Analyzed:	06/01/2020 1250h											
Test Code:	200.8-W	Date Prepared:	05/29/2020 1625h										
Antimony	< 0.00400	mg/L	E200.8	0.000734	0.00400								
Arsenic	< 0.00200	mg/L	E200.8	0.000298	0.00200								
Barium	< 0.00200	mg/L	E200.8	0.000544	0.00200								
Beryllium	< 0.00200	mg/L	E200.8	0.000198	0.00200								
Cadmium	< 0.000500	mg/L	E200.8	0.0000742	0.000500								
Chromium	< 0.00200	mg/L	E200.8	0.00191	0.00200								
Cobalt	< 0.00400	mg/L	E200.8	0.000300	0.00400								
Lead	< 0.00200	mg/L	E200.8	0.000448	0.00200								
Molybdenum	< 0.00200	mg/L	E200.8	0.000652	0.00200								
Selenium	< 0.00200	mg/L	E200.8	0.000508	0.00200								
Thallium	< 0.00200	mg/L	E200.8	0.000390	0.00200								
Lab Sample ID: MB-70161	Date Analyzed:	06/01/2020 1513h											
Test Code:	200.8-W	Date Prepared:	06/01/2020 1025h										
Antimony	< 0.00400	mg/L	E200.8	0.000734	0.00400								
Arsenic	< 0.00200	mg/L	E200.8	0.000298	0.00200								
Barium	< 0.00200	mg/L	E200.8	0.000544	0.00200								
Beryllium	< 0.00200	mg/L	E200.8	0.000198	0.00200								
Cadmium	< 0.000500	mg/L	E200.8	0.0000742	0.000500								
Chromium	< 0.00200	mg/L	E200.8	0.00191	0.00200								
Cobalt	< 0.00400	mg/L	E200.8	0.000300	0.00400								
Lead	< 0.00200	mg/L	E200.8	0.000448	0.00200								
Molybdenum	< 0.00200	mg/L	E200.8	0.000652	0.00200								
Selenium	< 0.00200	mg/L	E200.8	0.000508	0.00200								

Report Date: 6/10/2020 Page 32 of 43

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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MBLK

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: MB-70161	Date Analyzed:	06/01/2020	1513h										
Test Code:	200.8-W	Date Prepared:	06/01/2020	1025h									
Thallium	< 0.00200	mg/L	E200.8	0.000390	0.00200								
Lab Sample ID: MB-70109	Date Analyzed:	05/29/2020	1731h										
Test Code:	HG-DW-245.1	Date Prepared:	05/18/2020	1242h									
Mercury	< 0.0000900	mg/L	E245.1	0.0000396	0.0000900								



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-013BMS	Date Analyzed:	06/01/2020 1314h											
Test Code:	200.7-W	Date Prepared:	05/29/2020 1625h										
Calcium	466	mg/L	E200.7	2.11	10.0	10.00	487	-204	70 - 130				2
Lithium	5.05	mg/L	E200.7	0.207	1.00	1.000	4.08	96.9	75 - 125				
Lab Sample ID: 2005382-013BMS	Date Analyzed:	06/03/2020 1318h											
Test Code:	200.7-W	Date Prepared:	05/29/2020 1625h										
Boron	3.50	mg/L	E200.7	0.0449	0.500	1.000	2.42	108	70 - 130				
Lab Sample ID: 2005382-014BMS	Date Analyzed:	06/03/2020 1423h											
Test Code:	200.7-W	Date Prepared:	05/29/2020 1625h										
Boron	1.16	mg/L	E200.7	0.0449	0.500	1.000	0	116	70 - 130				
Calcium	10.4	mg/L	E200.7	0.211	1.00	10.00	0	104	70 - 130				
Lithium	1.07	mg/L	E200.7	0.0207	0.100	1.000	0	107	75 - 125				
Lab Sample ID: 2005382-013BMS	Date Analyzed:	06/01/2020 1346h											
Test Code:	200.8-W	Date Prepared:	05/29/2020 1625h										
Antimony	0.212	mg/L	E200.8	0.000734	0.00400	0.2000	0	106	75 - 125				
Arsenic	0.221	mg/L	E200.8	0.000298	0.00200	0.2000	0.000546	110	75 - 125				
Barium	0.198	mg/L	E200.8	0.000544	0.00200	0.2000	0.0101	94.0	75 - 125				
Beryllium	0.185	mg/L	E200.8	0.000198	0.00200	0.2000	0	92.4	75 - 125				
Cadmium	0.192	mg/L	E200.8	0.0000742	0.000500	0.2000	0.000136	96.0	75 - 125				
Chromium	0.182	mg/L	E200.8	0.00191	0.00200	0.2000	0	91.1	75 - 125				
Cobalt	0.189	mg/L	E200.8	0.000300	0.00400	0.2000	0.007	91.2	75 - 125				
Lead	0.181	mg/L	E200.8	0.000448	0.00200	0.2000	0	90.3	75 - 125				
Molybdenum	0.226	mg/L	E200.8	0.000652	0.00200	0.2000	0.00377	111	75 - 125				
Selenium	0.210	mg/L	E200.8	0.000508	0.00200	0.2000	0.00297	104	75 - 125				
Thallium	0.176	mg/L	E200.8	0.000390	0.00200	0.2000	0	88.0	75 - 125				
Lab Sample ID: 2005382-011BMS	Date Analyzed:	06/01/2020 1531h											
Test Code:	200.8-W	Date Prepared:	06/01/2020 1025h										
Antimony	0.426	mg/L	E200.8	0.00147	0.00800	0.4000	0.00245	106	75 - 125				

Report Date: 6/10/2020 Page 34 of 43

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Kyle F. Gross

Laboratory Director

Jose Rocha

QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-011BMS	Date Analyzed:	06/01/2020 1531h											
Test Code:	200.8-W	Date Prepared:	06/01/2020 1025h										
Arsenic	0.434	mg/L	E200.8	0.000596	0.00400	0.4000	0.000473	108	75 - 125				
Barium	0.387	mg/L	E200.8	0.00109	0.00400	0.4000	0.0111	93.9	75 - 125				
Beryllium	0.372	mg/L	E200.8	0.000396	0.00400	0.4000	0	93.1	75 - 125				
Cadmium	0.393	mg/L	E200.8	0.000148	0.00100	0.4000	0.00162	98.0	75 - 125				
Chromium	0.373	mg/L	E200.8	0.00382	0.00400	0.4000	0	93.2	75 - 125				
Cobalt	0.595	mg/L	E200.8	0.000600	0.00800	0.4000	0.207	96.8	75 - 125				
Lead	0.383	mg/L	E200.8	0.000896	0.00400	0.4000	0.00724	94.0	75 - 125				
Molybdenum	0.817	mg/L	E200.8	0.00130	0.00400	0.4000	0.39	107	75 - 125				
Selenium	0.392	mg/L	E200.8	0.00102	0.00400	0.4000	0.0012	97.7	75 - 125				
Thallium	0.368	mg/L	E200.8	0.000780	0.00400	0.4000	0.000547	91.8	75 - 125				
Lab Sample ID: 2005382-002BMS	Date Analyzed:	05/29/2020 1748h											
Test Code:	HG-DW-245.1	Date Prepared:	05/18/2020 1242h										
Mercury	0.00281	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	84.4	80 - 120				

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

2005382-011BMS: Insufficient sample amount was provided to allow for a full amount analysis of the MS/MSD. Reduced sample volume for the MS/MSD was used as a result.



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Jose Rocha
QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MSD

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-013BMSD													
Test Code:	200.7-W	Date Analyzed:	06/01/2020 1317h	Date Prepared:	05/29/2020 1625h								
Calcium	480	mg/L	E200.7	2.11	10.0	10.00	487	-70.6	70 - 130	466	2.83	20	2
Lithium	5.07	mg/L	E200.7	0.207	1.00	1.000	4.08	98.3	75 - 125	5.05	0.284	20	
Lab Sample ID: 2005382-013BMSD													
Test Code:	200.7-W	Date Analyzed:	06/03/2020 1321h	Date Prepared:	05/29/2020 1625h								
Boron	3.48	mg/L	E200.7	0.0449	0.500	1.000	2.42	106	70 - 130	3.5	0.640	20	
Lab Sample ID: 2005382-014BMSD													
Test Code:	200.7-W	Date Analyzed:	06/03/2020 1403h	Date Prepared:	05/29/2020 1625h								
Boron	1.16	mg/L	E200.7	0.0449	0.500	1.000	0	116	70 - 130	1.16	0.0155	20	
Calcium	10.4	mg/L	E200.7	0.211	1.00	10.00	0	104	70 - 130	10.4	0.504	20	
Lithium	1.08	mg/L	E200.7	0.0207	0.100	1.000	0	108	75 - 125	1.07	1.23	20	
Lab Sample ID: 2005382-013BMSD													
Test Code:	200.8-W	Date Analyzed:	06/01/2020 1349h	Date Prepared:	05/29/2020 1625h								
Antimony	0.213	mg/L	E200.8	0.000734	0.00400	0.2000	0	106	75 - 125	0.212	0.509	20	
Arsenic	0.226	mg/L	E200.8	0.000298	0.00200	0.2000	0.000546	113	75 - 125	0.221	2.26	20	
Barium	0.203	mg/L	E200.8	0.000544	0.00200	0.2000	0.0101	96.4	75 - 125	0.198	2.38	20	
Beryllium	0.190	mg/L	E200.8	0.000198	0.00200	0.2000	0	95.1	75 - 125	0.185	2.94	20	
Cadmium	0.194	mg/L	E200.8	0.0000742	0.000500	0.2000	0.000136	96.9	75 - 125	0.192	0.867	20	
Chromium	0.189	mg/L	E200.8	0.00191	0.00200	0.2000	0	94.3	75 - 125	0.182	3.51	20	
Cobalt	0.196	mg/L	E200.8	0.000300	0.00400	0.2000	0.007	94.7	75 - 125	0.189	3.64	20	
Lead	0.183	mg/L	E200.8	0.000448	0.00200	0.2000	0	91.6	75 - 125	0.181	1.39	20	
Molybdenum	0.225	mg/L	E200.8	0.000652	0.00200	0.2000	0.00377	111	75 - 125	0.226	0.296	20	
Selenium	0.219	mg/L	E200.8	0.000508	0.00200	0.2000	0.00297	108	75 - 125	0.21	4.08	20	
Thallium	0.178	mg/L	E200.8	0.000390	0.00200	0.2000	0	89.1	75 - 125	0.176	1.30	20	
Lab Sample ID: 2005382-011BMSD													
Test Code:	200.8-W	Date Analyzed:	06/01/2020 1534h	Date Prepared:	06/01/2020 1025h								
Antimony	0.420	mg/L	E200.8	0.00147	0.00800	0.4000	0.00245	104	75 - 125	0.426	1.27	20	



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Laboratory Director

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QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: ME

QC Type: MSD

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-011BMSD	Date Analyzed:	06/01/2020 1534h											
Test Code:	200.8-W	Date Prepared:	06/01/2020 1025h										
Arsenic	0.437	mg/L	E200.8	0.000596	0.00400	0.4000	0.000473	109	75 - 125	0.434	0.717	20	
Barium	0.390	mg/L	E200.8	0.00109	0.00400	0.4000	0.0111	94.6	75 - 125	0.387	0.713	20	
Beryllium	0.377	mg/L	E200.8	0.000396	0.00400	0.4000	0	94.2	75 - 125	0.372	1.16	20	
Cadmium	0.388	mg/L	E200.8	0.000148	0.00100	0.4000	0.00162	96.6	75 - 125	0.393	1.35	20	
Chromium	0.376	mg/L	E200.8	0.00382	0.00400	0.4000	0	94.0	75 - 125	0.373	0.824	20	
Cobalt	0.604	mg/L	E200.8	0.000600	0.00800	0.4000	0.207	99.0	75 - 125	0.595	1.48	20	
Lead	0.388	mg/L	E200.8	0.000896	0.00400	0.4000	0.00724	95.2	75 - 125	0.383	1.25	20	
Molybdenum	0.832	mg/L	E200.8	0.00130	0.00400	0.4000	0.39	111	75 - 125	0.817	1.88	20	
Selenium	0.397	mg/L	E200.8	0.00102	0.00400	0.4000	0.0012	99.0	75 - 125	0.392	1.25	20	
Thallium	0.373	mg/L	E200.8	0.000780	0.00400	0.4000	0.000547	93.2	75 - 125	0.368	1.49	20	
Lab Sample ID: 2005382-002BMSD	Date Analyzed:	05/29/2020 1750h											
Test Code:	HG-DW-245.1	Date Prepared:	05/18/2020 1242h										
Mercury	0.00282	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	84.5	80 - 120	0.00281	0.118	20	

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

2005382-011BMSD: Insufficient sample amount was provided to allow for a full amount analysis of the MS/MSD. Reduced sample volume for the MS/MSD was used as a result.



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: WC

QC Type: DUP

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005381-001ADUP Test Code: PH-4500H+B	Date Analyzed: 05/15/2020 1616h												
pH @ 25° C	7.90	pH Units	SM4500-H+B	1.00	1.00					7.85	0.635	5	H
Lab Sample ID: 2005381-011ADUP Test Code: PH-4500H+B	Date Analyzed: 05/15/2020 1616h												
pH @ 25° C	7.28	pH Units	SM4500-H+B	1.00	1.00					7.25	0.413	5	H
Lab Sample ID: 2005382-005ADUP Test Code: PH-4500H+B	Date Analyzed: 05/15/2020 1647h												
pH @ 25° C	7.32	pH Units	SM4500-H+B	1.00	1.00					7.32	0	5	H
Lab Sample ID: 2005382-014ADUP Test Code: PH-4500H+B	Date Analyzed: 05/18/2020 1252h												
pH @ 25° C	5.64	pH Units	SM4500-H+B	1.00	1.00					5.64	0	5	H
Lab Sample ID: 2005382-001ADUP Test Code: TDS-W-2540C	Date Analyzed: 05/18/2020 1200h												
Total Dissolved Solids	34,600	mg/L	SM2540C	80.0	100					33600	2.93	5	
Lab Sample ID: 2005381-013ADUP Test Code: TDS-W-2540C	Date Analyzed: 06/04/2020 1120h												
Total Dissolved Solids	3,200	mg/L	SM2540C	40.0	50.0					3220	0.623	5	H*
Lab Sample ID: 2005382-012ADUP Test Code: TDS-W-2540C	Date Analyzed: 06/04/2020 1120h												
Total Dissolved Solids	10,100	mg/L	SM2540C	400	500					9900	2.00	5	H*

H - Sample was received outside of the holding time.

H* - The original analysis performed within the holding time yielded an anomalous result; thus, the sample was reanalyzed outside the holding time.



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: WC

QC Type: LCS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: LCS-R139212 Date Analyzed: 05/22/2020 1034h													
Test Code: 300.0-W													
Chloride	5.20	mg/L	E300.0	0.0565	0.100	5.000	0	104	90 - 110				
Fluoride	5.32	mg/L	E300.0	0.0240	0.100	5.000	0	106	90 - 110				
Sulfate	5.40	mg/L	E300.0	0.136	0.750	5.000	0	108	90 - 110				
Lab Sample ID: LCS-R139214 Date Analyzed: 05/27/2020 1034h													
Test Code: 300.0-W													
Fluoride	5.40	mg/L	E300.0	0.0240	0.100	5.000	0	108	90 - 110				
Lab Sample ID: LCS-R139335 Date Analyzed: 05/29/2020 1325h													
Test Code: F-W-4500FC													
Fluoride	0.913	mg/L	SM4500-F-C	0.0378	0.100	1.000	0	91.3	90 - 110				
Lab Sample ID: LCS-R138872 Date Analyzed: 05/15/2020 1616h													
Test Code: PH-4500H+B													
pH @ 25° C	9.01	pH Units	SM4500-H+B	1.00	1.00	9.000	0	100	98 - 102				
Lab Sample ID: LCS-R138873 Date Analyzed: 05/15/2020 1647h													
Test Code: PH-4500H+B													
pH @ 25° C	9.07	pH Units	SM4500-H+B	1.00	1.00	9.000	0	101	98 - 102				
Lab Sample ID: LCS-R138916 Date Analyzed: 05/18/2020 1252h													
Test Code: PH-4500H+B													
pH @ 25° C	9.09	pH Units	SM4500-H+B	1.00	1.00	9.000	0	101	98 - 102				
Lab Sample ID: LCS-R138945 Date Analyzed: 05/18/2020 1200h													
Test Code: TDS-W-2540C													
Total Dissolved Solids	208	mg/L	SM2540C	8.00	10.0	205.0	0	101	80 - 120				
Lab Sample ID: LCS-R139538 Date Analyzed: 06/04/2020 1120h													
Test Code: TDS-W-2540C													
Total Dissolved Solids	194	mg/L	SM2540C	8.00	10.0	205.0	0	94.6	80 - 120				

Report Date: 6/10/2020 Page 39 of 43

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QC SUMMARY REPORT

Client: PacifiCorp

Contact: Jeff Tucker



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: WC

QC Type: MBLK

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: MB-R139212	Date Analyzed:	05/22/2020	1017h										
Test Code:	300.0-W												
Chloride	< 0.100	mg/L	E300.0	0.0565	0.100								
Fluoride	< 0.100	mg/L	E300.0	0.0240	0.100								
Sulfate	< 0.750	mg/L	E300.0	0.136	0.750								
Lab Sample ID: MB-R139214	Date Analyzed:	05/27/2020	1017h										
Test Code:	300.0-W												
Fluoride	< 0.100	mg/L	E300.0	0.0240	0.100								
Lab Sample ID: MB-R139335	Date Analyzed:	05/29/2020	1325h										
Test Code:	F-W-4500FC												
Fluoride	< 0.100	mg/L	SM4500-F-C	0.0378	0.100								
Lab Sample ID: MB-R138945	Date Analyzed:	05/18/2020	1200h										
Test Code:	TDS-W-2540C												
Total Dissolved Solids	< 10.0	mg/L	SM2540C	8.00	10.0								
Lab Sample ID: MB-R139538	Date Analyzed:	06/04/2020	1120h										
Test Code:	TDS-W-2540C												
Total Dissolved Solids	< 10.0	mg/L	SM2540C	8.00	10.0								



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: WC

QC Type: MS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-004AMS Date Analyzed: 05/22/2020 1445h													
Test Code: 300.0-W													
Chloride	13,200	mg/L	E300.0	113	200	10,000	2770	105	90 - 110				
Fluoride	10,500	mg/L	E300.0	48.0	200	10,000	0	105	90 - 110				
Sulfate	18,800	mg/L	E300.0	272	1,500	10,000	8300	105	90 - 110				
Lab Sample ID: 2005382-005AMS Date Analyzed: 05/22/2020 1535h													
Test Code: 300.0-W													
Chloride	14,500	mg/L	E300.0	113	200	10,000	4160	104	90 - 110				
Fluoride	10,600	mg/L	E300.0	48.0	200	10,000	0	106	90 - 110				
Sulfate	19,000	mg/L	E300.0	272	1,500	10,000	8220	108	90 - 110				
Lab Sample ID: 2005382-011AMS Date Analyzed: 05/27/2020 1124h													
Test Code: 300.0-W													
Fluoride	22.1	mg/L	E300.0	0.0960	0.400	20.00	0.885	106	90 - 110				
Lab Sample ID: 2005382-012AMS Date Analyzed: 05/27/2020 1214h													
Test Code: 300.0-W													
Fluoride	21.1	mg/L	E300.0	0.0960	0.400	20.00	0.799	101	90 - 110				
Lab Sample ID: 2005381-014AMS Date Analyzed: 05/29/2020 1325h													
Test Code: F-W-4500FC													
Fluoride	1.57	mg/L	SM4500-F-C	0.0378	0.100	1.000	0.574	99.6	80 - 120				



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2005382

Project: Hunter CCR Groundwater Sampling / PERCM052

Contact: Jeff Tucker

Dept: WC

QC Type: MSD

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2005382-004AMSD Date Analyzed: 05/22/2020 1502h													
Test Code: 300.0-W													
Chloride	13,200	mg/L	E300.0	113	200	10,000	2770	104	90 - 110	13200	0.162	20	
Fluoride	10,400	mg/L	E300.0	48.0	200	10,000	0	104	90 - 110	10500	1.02	20	
Sulfate	18,800	mg/L	E300.0	272	1,500	10,000	8300	105	90 - 110	18800	0.0905	20	
Lab Sample ID: 2005382-005AMSD Date Analyzed: 05/22/2020 1552h													
Test Code: 300.0-W													
Chloride	14,500	mg/L	E300.0	113	200	10,000	4160	103	90 - 110	14500	0.235	20	
Fluoride	10,700	mg/L	E300.0	48.0	200	10,000	0	107	90 - 110	10600	0.590	20	
Sulfate	19,100	mg/L	E300.0	272	1,500	10,000	8220	109	90 - 110	19000	0.458	20	
Lab Sample ID: 2005382-011AMSD Date Analyzed: 05/27/2020 1141h													
Test Code: 300.0-W													
Fluoride	21.7	mg/L	E300.0	0.0960	0.400	20.00	0.885	104	90 - 110	22.1	1.85	20	
Lab Sample ID: 2005382-012AMSD Date Analyzed: 05/27/2020 1231h													
Test Code: 300.0-W													
Fluoride	21.4	mg/L	E300.0	0.0960	0.400	20.00	0.799	103	90 - 110	21.1	1.45	20	
Lab Sample ID: 2005381-014AMSD Date Analyzed: 05/29/2020 1325h													
Test Code: F-W-4500FC													
Fluoride	1.65	mg/L	SM4500-F-C	0.0378	0.100	1.000	0.574	108	80 - 120	1.57	4.97	10	

WORK ORDER Summary

Work Order: **2005382** Page 1 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Client ID: PAC900

Contact: Jeff Tucker

Project: Hunter CCR Groundwater Sampling / PERCM052

QC Level: II+

WO Type: Project

Comments: QC2+. Include EDD. Footnote report, pH received outside of hold. Sample for Radium sent to ALS - Ft. Collins. Email report and EDD to 4 people. 5-29-20 - Metals changed from 6010/6020 to 200.7/200.8 to follow historical.;

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage
2005382-001A	ELF-10	5/12/2020 2020h	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - w/tds	
				TDS-W-2540C		df - w/tds	
2005382-001B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-001C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-002A	ELF-11	5/12/2020 1730h	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - w/tds	
				TDS-W-2540C		df - w/tds	
2005382-002B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-002C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-003A	ELF-12	5/12/2020 1920h	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - w/tds	
				TDS-W-2540C		df - w/tds	

WORK ORDER Summary

Work Order: **2005382** Page 2 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage
2005382-003B	ELF-12	5/12/2020 1920h	5/15/2020 1426h	200.7-W	Aqueous	df - metals	1
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-003C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-004A	ELF-13	5/12/2020 1850h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-004B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-004C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-005A	ELF-14	5/12/2020 1800h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-005B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-005C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-006A	ELF-1D	5/13/2020 1130h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	

WORK ORDER Summary

Work Order: **2005382** Page 3 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage
2005382-006A	ELF-1D	5/13/2020 1130h	5/15/2020 1426h	TDS-W-2540C	Aqueous	df - wc/tds	1
2005382-006B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-006C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-007A	ELF-2	5/13/2020 1045h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-007B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-007C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-008A	ELF-3	5/13/2020 1330h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-008B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-008C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-009A	ELF-4	5/13/2020 1115h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			

WORK ORDER Summary

Work Order: **2005382** Page 4 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage
2005382-009A	ELF-4	5/13/2020 1115h	5/15/2020 1426h	PH-4500H+B	Aqueous	df - wc/tds	1
				TDS-W-2540C		df - wc/tds	
2005382-009B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-009C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-010A	ELF-7	5/13/2020 1205h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-010B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-010C				OUTSIDE LAB		ALS - Ft. Collins.	2
2005382-011A	ELF-8	5/13/2020 0945h	5/15/2020 1426h	300.0-W	Aqueous	df - wc/tds	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		df - wc/tds	
				TDS-W-2540C		df - wc/tds	
2005382-011B				200.7-W		df - metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		df - metals	
				200.8-W		df - metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL			
				200.8-W-PR		df - metals	
				HG-DW-245.1		df - metals	
				HG-DW-PR		df - metals	
2005382-011C				OUTSIDE LAB		ALS - Ft. Collins.	2

WORK ORDER Summary

Work Order: **2005382** Page 5 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage	
2005382-012A	ELF-9	5/13/2020 1300h	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds		1
				3 SEL Analytes: CL F SO4				
				PH-4500H+B		df - w/tds		
				TDS-W-2540C		df - w/tds		
2005382-012B				200.7-W		df - metals		
				3 SEL Analytes: B CA LI				
				200.7-W-PR		df - metals		
				200.8-W		df - metals		
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL				
				200.8-W-PR		df - metals		
				HG-DW-245.1		df - metals		
				HG-DW-PR		df - metals		
2005382-012C				OUTSIDE LAB		ALS - Ft. Collins.		2
2005382-013A	Group B - DUP	5/12/2020	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds		1
				3 SEL Analytes: CL F SO4				
				PH-4500H+B		df - w/tds		
				TDS-W-2540C		df - w/tds		
2005382-013B				200.7-W		df - metals		
				3 SEL Analytes: B CA LI				
				200.7-W-PR		df - metals		
				200.8-W		df - metals		
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL				
				200.8-W-PR		df - metals		
				HG-DW-245.1		df - metals		
				HG-DW-PR		df - metals		
2005382-013C				OUTSIDE LAB		ALS - Ft. Collins.		2
2005382-014A	Group B - Blank	5/13/2020 1120h	5/15/2020 1426h	300.0-W	Aqueous	df - w/tds		1
				3 SEL Analytes: CL F SO4				
				PH-4500H+B		df - w/tds		
				TDS-W-2540C		df - w/tds		
2005382-014B				200.7-W		df - metals		
				3 SEL Analytes: B CA LI				
				200.7-W-PR		df - metals		
				200.8-W		df - metals		
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL				
				200.8-W-PR		df - metals		
				HG-DW-245.1		df - metals		
				HG-DW-PR		df - metals		

WORK ORDER Summary

Work Order: **2005382** Page 6 of 6

Client: PacifiCorp

Due Date: 6/1/2020

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage
2005382-014C	Group B - Blank	5/13/2020 1120h	5/15/2020 1426h	OUTSIDE LAB	Aqueous	ALS - Ft. Collins. 2

AWAL Use Only - One or more samples expired upon receipt:

Test Code

PH-4500H+B

www.awal-labs.com

2005382
AWAL Lab Sample Set

1964

All analyses were conducted using RFLAP accredited methods and all data will be reported using AWA's standard analysis tests and reporting limits (PQL) unless specifically reported otherwise to this Chain of Custody and/or attached documentation.

[illegible]

By signing this Chain of Custody you are agreeing to permit AWWAL to subcontract any analyses not previously performed at AWWAL.

KL 41.1.18

www.pwal-labs.com

All analysis will be conducted using NEAP accredited methods and all data will be reported using AWC's standard analytic lists and reporting limits (RQL) unless specifically requested otherwise on the Chain of Custody and/or attached documentation.

200538 Z

AWA Lab Sample Set 4

Page 2 of 2

Client: Pacificorp-UT

Address:

City, State, Zip:

Contact: **Jeff Tucker**

[illegible]

Call 6

E-mail: Jeff.Tucker@Pacificorp.com

Project Name: **Hunter CCR Groundwater Sampling**

PERCM052

PO 2:

Sampler Name: **Mike Shirley**

	Sample ID:	Date Sampled	Time Sampled
1	14 GROUP B - BLANK	5/13/2007	1:20
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

QC Level:	Turn Around Time:
1 2 2+ 3 3+	1 2 3 4 5 Std

Unless other arrangements have been made, signed reports will be emailed by 5:00 pm on the day they are due.

Case Date 6/1/19

Laboratory Use Only

COC Topic Was:

1	Present on Outer Package	Y	N	NA
2	Untersuchen von Outer Package	Y	N	NA
3	Present in Sample	Y	N	NA
4	Untersuchen von Sample	Y	N	NA

Samples Were:
 1 Shipped or hand delivered
 2 Ambient or chilled
 3 Temperature: 0.3 °C
 4 Received intact
 Y N
 5 Properly preserved
 Y N Checked at bench
 6 Received Within
 Holding Time
 Y N
 pH ~~5.1~~ 5.1 out of hold
 Samples Labels and COC Record Match?
 Y N

- ☐ Report down to the MDL
- ☐ Include EDD:
- ☐ Lab Filter for:
- ☐ Field Filtered For:

For Compliance With:

- ☐ NELAP
- ☐ RCRA
- ☐ CWA
- ☐ SDWA
- ☐ ELAP / AQLA
- ☐ NELAP
- ☐ Non-Compliance
- ☐ Other:

Known Hazards
&
Sample Comments

Sample Comments

Acquired by: Signature: <i>[Signature]</i> Print Name: Dennis Vanderbeek Requisitioned by: Signature: _____ Print Name: _____	Date: 5-15-20 Date: 14/1/26 Date: _____ Date: _____ Date: _____ Date: _____ Date: _____	Received by: Signature: <i>[Signature]</i> Print Name: Dennis Brown Received by: Signature: _____ Print Name: _____ Received by: Signature: _____ Print Name: _____	Date: 5/15/20 Date: 14/1/26 Date: _____ Date: _____ Date: _____ Date: _____
---	---	--	--

Special Instructions:

Please CC analytical report and EDD to:

mholland@waterenvtech.com

eerickson@waterenvtech.com

derickson@waterenvtech.com

By signing this Chain of Custody you are agreeing to permit AWAEL to subcontract any analyses not normally performed at AWAEL.

9. 4. 2. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839

Huntington Power Plant - Combined CCR & DEQ Groundwater Monitoring Requirements

| GROUP A | GROUP B | GROUP C | GROUP D | GROUP E |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| Alkalinity | Alkalinity | Alkalinity | Total Dissolved Solids | Alkalinity |
| Specific Conductance | Specific Conductance | Specific Conductance | Fluoride | Specific Conductance |
| Total Dissolved Solids | Total Dissolved Solids | Total Dissolved Solids | pH | Total Dissolved Solids |
| pH | pH | pH | Radium | Fluoride |
| Boron | Boron | Boron | Antimony | pH |
| Calcium | Calcium | Calcium | Arsenic | Radium |
| Magnesium | Magnesium | Magnesium | Barium | Antimony |
| Potassium | Potassium | Potassium | Beryllium | Arsenic |
| Sodium | Sodium | Sodium | Boron | Barium |
| Chloride | Chloride | Chloride | Cadmium | Beryllium |
| Sulfate | Sulfate | Sulfate | Calcium | Boron |
| Nitrate | Nitrate | Nitrate | Chromium | Cadmium |
| | Selenium | Aluminum | Cobalt | Calcium |
| | | Total Iron | Lead | Chromium |
| | | | Lithium | Cobalt |
| | | | Molybdenum | Lead |
| | | | Selenium | Lithium |
| | | | Thallium | Magnesium |
| | | | Mercury | Molybdenum |
| | | | Chloride | Potassium |
| | | | Sulfate | Selenium |
| | | | | Sodium |
| | | | | Thallium |
| | | | | Mercury |
| | | | | Chloride |
| | | | | Sulfate |
| | | | | Nitrate |

Lab Set ID: 2005382
 pH Lot #: 6299

Preservation Check Sheet

Sample Set Extension and pH

| Analysis | Preservative | -001 | -002 | -003 | -004 | -005 | -006 | -007 | -008 | -009 | -010 | -011 | -012 | -013 | -014 | | | | |
|----------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|
| Ammonia | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| COD | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| Cyanide | pH >12 NaOH | | | | | | | | | | | | | | | | | | |
| Metals | pH <2 HNO ₃ | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | | | | |
| NO ₂ /NO ₃ | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| O & G | pH <2 HCL | | | | | | | | | | | | | | | | | | |
| Phenols | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| Sulfide | pH >9 NaOH,
Zn Acetate | | | | | | | | | | | | | | | | | | |
| TKN | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| T PO ₄ | pH <2 H ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
| Cr VI+ | pH >9
(NH ₄) ₂ SO ₄ | | | | | | | | | | | | | | | | | | |
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- Procedure:
- 1) Pour a small amount of sample in the sample lid
 - 2) Pour sample from lid gently over wide range pH paper
 - 3) **Do Not** dip the pH paper in the sample bottle or lid
 - 4) If sample is not preserved, properly list its extension and receiving pH in the appropriate column above
 - 5) Flag COC, notify client if requested
 - 6) Place client conversation on COC
 - 7) Samples may be adjusted

Frequency: All samples requiring preservation

- * The sample required additional preservative upon receipt.
- + The sample was received unpreserved.
- ▲ The sample was received unpreserved and therefore preserved upon receipt.
- # The sample pH was unadjustable to a pH < 2 due to the sample matrix.
- The sample pH was unadjustable to a pH > ____ due to the sample matrix interference.



Radium-226

Case Narrative

American West Analytical Labs

Hunter CCR Groundwater Sampling – PERCM052 -2005382

Work Order Number: 2005312

1. This report consists of the analytical results for 14 water samples received by ALS on 05/21/2020.
2. These samples were prepared and analyzed according to the current revision of SOP 783. Due to limited sample volume, samples 2005312-1 and -6 were run sequentially after the Ra-228 analysis from batch RA200529-1. The analyses were completed on 06/16/2020.
3. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate in both batches.
5. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for samples 2005312-1 and -6 fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. These samples are identified with a "Y1" flag on the final reports.
6. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
7. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen
Pik Yee Yuen
Radiochemistry Primary Data Reviewer

6/16/20
Date

Kath M. W.
Radiochemistry Final Data Reviewer

6/16/20
Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2005312

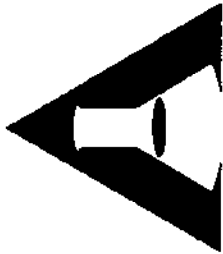
Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Groundwater Sampling

Client Project Number: PERCM052

Client PO Number: 2005382

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|----------------------|-------------------|------------|--------|----------------|----------------|
| ELF-10 | 2005312-1 | | WATER | 12-May-20 | 20:20 |
| ELF-11 | 2005312-2 | | WATER | 12-May-20 | 17:30 |
| ELF-12 | 2005312-3 | | WATER | 12-May-20 | 19:20 |
| ELF-13 | 2005312-4 | | WATER | 12-May-20 | 18:50 |
| ELF-14 | 2005312-5 | | WATER | 12-May-20 | 18:00 |
| ELF-1D | 2005312-6 | | WATER | 13-May-20 | 11:30 |
| ELF-2 | 2005312-7 | | WATER | 13-May-20 | 10:45 |
| ELF-3 | 2005312-8 | | WATER | 13-May-20 | 13:30 |
| ELF-4 | 2005312-9 | | WATER | 13-May-20 | 11:15 |
| ELF-7 | 2005312-10 | | WATER | 13-May-20 | 12:05 |
| ELF-8 | 2005312-11 | | WATER | 13-May-20 | 9:45 |
| ELF-9 | 2005312-12 | | WATER | 13-May-20 | 13:00 |
| Group B - DUP | 2005312-13 | | WATER | 12-May-20 | |
| Group B - Blank | 2005312-14 | | WATER | 13-May-20 | 11:20 |



American West
Analytical Laboratories
3440 S. 700 W. Salt Lake City, UT 84119
Phone # (801) 263-8686 Toll Free # (888) 263-8686
Fax # (801) 263-8687 Email: awal@awal-labs.com
www.awal-labs.com

Client: American West Analytical Laboratories
Address: 3440 S. 700 W.
City, State, Zip: Salt Lake City, UT 84119
Contact: Elena Hayward
Phone #: (801) 263-8686 Cell #: _____
E-mail: elona@awal-labs.com; denise@awal-labs.com
Project Name: Hunter CCR Groundwater Sampling
Project #: PERCM052
PO #: 2005382
Sampler Name: _____

| | Sample ID: | Date Sampled | Time Sampled |
|----|-----------------|--------------|--------------|
| 1 | ELF-10 | 5/12/2020 | 20:20 |
| 2 | ELF-11 | 5/12/2020 | 17:30 |
| 3 | ELF-12 | 5/12/2020 | 19:20 |
| 4 | ELF-13 | 5/12/2020 | 18:50 |
| 5 | ELF-14 | 5/12/2020 | 18:00 |
| 6 | ELF-1D | 5/13/2020 | 11:30 |
| 7 | ELF-2 | 5/13/2020 | 10:45 |
| 8 | ELF-3 | 5/13/2020 | 13:30 |
| 9 | ELF-4 | 5/13/2020 | 11:15 |
| 10 | ELF-7 | 5/13/2020 | 12:05 |
| 11 | ELF-8 | 5/13/2020 | 9:45 |
| 12 | ELF-9 | 5/13/2020 | 13:00 |
| 13 | Group B - DUP | 5/12/2020 | |
| 14 | Group B - Blank | 5/13/2020 | 11:20 |
| 15 | | | |

Relinquished by: Denise Brun
Signature: _____ Date: 5/18/20
Print Name: Denise Brun
Relinquished by: _____ Date: 8:30
Signature: _____
Print Name: _____
Relinquished by: _____
Signature: _____
Print Name: _____

CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analysis lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

| | | | |
|---|-------------------------------|---|-----------|
| QC Level:
2+ | Turn Around Time:
Standard | Unless other arrangements have been made, signed reports will be emailed by
5:00 pm on the day they are due. | Due Date: |
| QC Tape Was:
1 Present on Outer Package Y N NA
2 Unbroken on Outer Package Y N NA
3 Present on Sample Y N
4 Unbroken on Sample Y N NA | | Laboratory Use Only | |
| For Compliance With:
NELAP
RCRA
CWA
SDWA
ELAP / A2LA
NLAP
Non-Compliance
Other: | | Samples Were:
1 Shipped or hand delivered
2 Ambient or Chilled
3 Temperature _____ °C
4 Received Intact Y N
5 Properly Preserved Y N Checked at bench
6 Received Within Holding Times Y N | |
| Known Hazards & Sample Comments | | Sample Labels and COC Record Match? Y N | |

Special Instructions:
QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS, MS/MSD performed on customer sample
Samples sent to ALS - Ft. Collins.



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: American West Analytical Labs

Workorder No: 2005312

Project Manager: KMO

Initials: AK

Date: 05/21/2020

| | | | | | | |
|--|-------------------------------------|---------------------|-------------------------------------|-------------------------------------|-------------------------------------|---|
| 1. Are airbills / shipping documents present and/or removable? | <input type="checkbox"/> | DROP OFF | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO |
| 2. Are custody seals on shipping containers intact? | <input checked="" type="checkbox"/> | NONE | <input checked="" type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO * |
| 3. Are custody seals on sample containers intact? | <input checked="" type="checkbox"/> | NONE | <input type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 4. Is there a COC (chain-of-custody) present? | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.) | <input checked="" type="checkbox"/> | | YES | <input type="checkbox"/> | | NO * |
| 6. Are short-hold samples present? | <input type="checkbox"/> | | YES | <input checked="" type="checkbox"/> | | NO |
| 7. Are all samples within holding times for the requested analyses? | <input checked="" type="checkbox"/> | | YES | <input type="checkbox"/> | | NO * |
| 8. Were all sample containers received intact? (not broken or leaking) | <input checked="" type="checkbox"/> | | YES | <input type="checkbox"/> | | NO * |
| 9. Is there sufficient sample for the requested analyses? | <input checked="" type="checkbox"/> | | YES | <input type="checkbox"/> | | NO * |
| 10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines) | <input checked="" type="checkbox"/> | | YES | <input type="checkbox"/> | | NO * |
| 11. Are all aqueous samples preserved correctly, if required? (excluding volatiles) | <input type="checkbox"/> | N/A | <input checked="" type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO * |
| 12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea) | <input checked="" type="checkbox"/> | N/A | <input type="checkbox"/> | YES | <input type="checkbox"/> | NO |
| 13. Were the samples shipped on ice? | <input type="checkbox"/> | | <input type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO |
| 14. Were cooler temperatures measured at 0.1-6.0°C? | <input type="checkbox"/> | IR gun used*: #3 #5 | <input checked="" type="checkbox"/> | RAD ONLY | <input type="checkbox"/> | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |
| Cooler #: | 1 | 2 | | | | |
| Temperature (°C): | AMB | AMB | | | | |
| # of custody seals on cooler: | | | | | | |
| External mR/hr reading: | 9 | 9 | | | | |
| Background mR/hr reading: | 11 | | | | | |
| Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.) | | | | | | |

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Sample 312-1-2 limited volume

Sample 312-6-2 limited Volume

Samples below had a pH >2; listed are sample-bottle numbers & amount of HNO₃ (lot # 234822) added to achieve the pH < 2.

312-2-1,2: 1.0ml

312-3-1,2: 1.0ml

312-8-1,2: 4.0ml

Were unpreserved bottles pH checked? YES / NA ☒

All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? YES / NO / NA Contact: _____

Date/Time: _____

Project Manager Signature / Date: [Signature] 5/21/20

62UPS Internet Shipping: View/Print Label

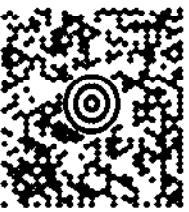

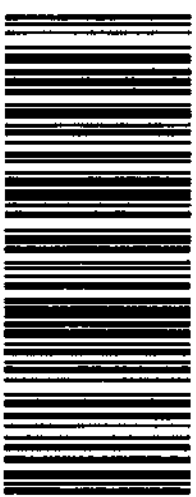

1. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
3. GETTING YOUR SHIPMENT TO UPS
 - Customers with a Daily Pickup
 - Your driver will pickup your shipment(s) as usual.
 - Customers without a Daily Pickup
 - Take your package to any location of The UPS Store®, UPS Access Point™ location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
 - Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages. Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 10741
4082 S REDWOOD RD
SALT LAKE CITY, UT 84123

UPS Access Point™
THE UPS STORE
1935 W 4700 S
TAYLORSVILLE, UT 84129

UPS Access Point™
THE UPS STORE
869 E 4500 S
SALT LAKE CITY, UT 84107

FOLD HERE

| | | |
|--|--|-------------|
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | 26 LBS | 4 OF 4 |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
AJS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524-2762 | DWT: 26.15, 13
AH | |
|  |  | CO 805 0-01 |
| UPS GROUND | | |
| TRACKING #: 1Z 9E7 258 03 9025 6915 | | |
|  | | |
| BILLING: P/P | | |
| UPS 22.0.11. WNTNVS0 28.04.04/2020 | | |
|  | | |

1. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. GETTING YOUR SHIPMENT TO UPS

Customers with a Daily Pickup
Your driver will pickup your shipment(s) as usual.

Customers without a Daily Pickup

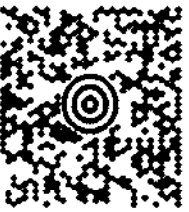



Take your package to any location of The UPS Store®, UPS Access Point™ location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services® (SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at [ups.com](https://www.ups.com).
Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages. Hand the package to any UPS driver in your area.

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TAYLORSVILLE, UT 84129

UPS Access Point™
THE UPS STORE
869 E 4500 S
SALT LAKE CITY, UT 84107

FOLD HERE

| | | |
|--|--------|--------|
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | 41 LBS | 1 OF 4 |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
ALS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524-2762 | | |
| 

CO 805 0-01 | | |
| UPS GROUND
TRACKING #: 1Z 9E7 258 03 9467 3289 | | |
|  | | |
| BILLING: P/P | | |
| US 22.0.11. WNTW90 28 04 04/2020  | | |

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200526-2MB

Sample Matrix: WATER

Prep Batch: RE200526-2

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200526-2-2

Result Units: pCi/l

Date Collected: 26-May-20

Run ID: RE200526-2A

File Name: Manual Entry

Date Prepared: 26-May-20

Count Time: 15 minutes

Date Analyzed: 07-Jun-20

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | -0.04 +/- 0.16 | 0.34 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16220 | 16030 | ug | 98.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 1 of 2

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200529-11MB

Sample Matrix: WATER

Prep Batch: RE200529-11

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200529-11-1

Result Units: pCi/l

Date Collected: 29-May-20

Run ID: RE200529-11A

File Name: Manual Entry

Date Prepared: 29-May-20

Count Time: 15 minutes

Date Analyzed: 16-Jun-20

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.22 +/- 0.22 | 0.32 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 31870 | 30170 | ug | 94.7 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

Page 2 of 2

LIMS Version: 7.010

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200526-2LCS

Sample Matrix: WATER

Prep Batch: RE200526-2

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200526-2-2

Result Units: pCi/l

Date Collected: 26-May-20

Run ID: RE200526-2A

File Name: Manual Entry

Date Prepared: 26-May-20

Count Time: 15 minutes

Date Analyzed: 07-Jun-20

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 44 +/- 11 | 1 | 46.46 | 95.3 | 67 - 120 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16220 | 15840 | ug | 97.6 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

Page 1 of 4

LIMS Version: 7.010

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200526-2LCSD

Sample Matrix: WATER

Prep Batch: RE200526-2

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200526-2-2

Result Units: pCi/l

Date Collected: 26-May-20

Run ID: RE200526-2A

File Name: Manual Entry

Date Prepared: 26-May-20

Count Time: 15 minutes

Date Analyzed: 07-Jun-20

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 45 +/- 11 | 1 | 46.46 | 96.8 | 67 - 120 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16220 | 16070 | ug | 99.0 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

Page 2 of 4

LIMS Version: 7.010

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200529-11LCS

Sample Matrix: WATER

Prep Batch: RE200529-11

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200529-11-1

Result Units: pCi/l

Date Collected: 29-May-20

Run ID: RE200529-11A

File Name: Manual Entry

Date Prepared: 29-May-20

Count Time: 15 minutes

Date Analyzed: 16-Jun-20

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 34.0 +/- 8.5 | 0.2 | 46.46 | 73.3 | 67 - 120 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 31870 | 31590 | ug | 99.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RE200529-11LCSD

Sample Matrix: WATER

Prep Batch: RE200529-11

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE200529-11-1

Result Units: pCi/l

Date Collected: 29-May-20

Run ID: RE200529-11A

File Name: Manual Entry

Date Prepared: 29-May-20

Count Time: 15 minutes

Date Analyzed: 16-Jun-20

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 48 +/- 12 | 0 | 46.46 | 103 | 67 - 120 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 31870 | 28920 | ug | 90.7 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

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Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID:
Lab ID: RE200526-2LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 26-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|------------|---------|-----|-------|------------|---------|-----|-------|--------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 13982-63-3 | Ra-226 | 44 +/- 11 | | 1 | P | 45 +/- 11 | | 1 | P | 0.0438 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

| | |
|-----------|-----------------|
| Field ID: | |
| Lab ID: | RE200529-11LCSD |

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 29-May-20

Date Prepared: 29-May-20

Date Analyzed: 16-Jun-20

Prep Batch: RE200529-11

QCBatchID: RE200529-11-1

Run ID: RE200529-11A

Count Time: 15 minutes

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|--------------|---------|-----|-------|------------|---------|-----|-------|-------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 13982-63-3 | Ra-226 | 34.0 +/- 8.5 | | 0.2 | P | 48 +/- 12 | | 0 | P | 0.949 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-10
Lab ID: 2005312-1

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 29-May-20

Date Analyzed: 16-Jun-20

Prep Batch: RE200529-11

QCBatchID: RE200529-11-1

Run ID: RE200529-11A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.29 +/- 0.26 | 0.38 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 31890 | 32480 | ug | 102 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-11
Lab ID: 2005312-2

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.40 +/- 0.25 | 0.27 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16240 | 15820 | ug | 97.4 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-12
Lab ID: 2005312-3

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.28 +/- 0.23 | 0.30 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15890 | ug | 97.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-13

Lab ID: 2005312-4

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 945 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.42 +/- 0.27 | 0.33 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15810 | ug | 97.4 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-14

Lab ID: 2005312-5

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.34 +/- 0.24 | 0.29 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15820 | ug | 97.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-1D
Lab ID: 2005312-6

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 29-May-20

Date Analyzed: 16-Jun-20

Prep Batch: RE200529-11

QCBatchID: RE200529-11-1

Run ID: RE200529-11A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.51 +/- 0.29 | 0.28 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 31900 | 32170 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-2
Lab ID: 2005312-7

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.16 +/- 0.20 | 0.30 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15820 | ug | 97.4 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-3
Lab ID: 2005312-8

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.71 +/- 0.36 | 0.29 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16250 | 15520 | ug | 95.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-4
Lab ID: 2005312-9

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.27 +/- 0.36 | 0.58 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15410 | ug | 94.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-7

Lab ID: 2005312-10

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.53 +/- 0.31 | 0.32 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15840 | ug | 97.6 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-8

Lab ID: 2005312-11

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.37 +/- 0.22 | 0.20 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16240 | 15960 | ug | 98.3 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-9

Lab ID: 2005312-12

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.21 +/- 0.21 | 0.29 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16240 | 15770 | ug | 97.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: Group B - DUP

Lab ID: 2005312-13

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 12-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.41 +/- 0.37 | 0.54 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16230 | 15580 | ug | 96.0 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: Group B - Blank

Lab ID: 2005312-14

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 13-May-20

Date Prepared: 26-May-20

Date Analyzed: 07-Jun-20

Prep Batch: RE200526-2

QCBatchID: RE200526-2-2

Run ID: RE200526-2A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 985 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.08 +/- 0.20 | 0.36 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 16220 | 15600 | ug | 96.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2005312-1



Radium-228

Case Narrative

American West Analytical Labs

Hunter CCR Groundwater Sampling – PERCM052 - 2005382

Work Order Number: 2005312

1. This report consists of the analytical results for 14 water samples received by ALS on 05/21/2020.
2. These samples were prepared according to the current revision of SOP 749.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to the current revision of SOP 724. The analyses were completed on 06/16/2020.
4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate in both batches.
6. The requested MDC was not met for sample 2005312-8. The reported activity for the sample exceeds the achieved MDC. This sample is identified with an "M3" qualifier on the final reports. Results are submitted without further qualification.
7. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen
Pik Yee Yuen
Radiochemistry Primary Data Reviewer

6/16/20
Date

Kath M. W.
Radiochemistry Final Data Reviewer

6/16/20
Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2005312

Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Groundwater Sampling

Client Project Number: PERCM052

Client PO Number: 2005382

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|----------------------|-------------------|------------|--------|----------------|----------------|
| ELF-10 | 2005312-1 | | WATER | 12-May-20 | 20:20 |
| ELF-11 | 2005312-2 | | WATER | 12-May-20 | 17:30 |
| ELF-12 | 2005312-3 | | WATER | 12-May-20 | 19:20 |
| ELF-13 | 2005312-4 | | WATER | 12-May-20 | 18:50 |
| ELF-14 | 2005312-5 | | WATER | 12-May-20 | 18:00 |
| ELF-1D | 2005312-6 | | WATER | 13-May-20 | 11:30 |
| ELF-2 | 2005312-7 | | WATER | 13-May-20 | 10:45 |
| ELF-3 | 2005312-8 | | WATER | 13-May-20 | 13:30 |
| ELF-4 | 2005312-9 | | WATER | 13-May-20 | 11:15 |
| ELF-7 | 2005312-10 | | WATER | 13-May-20 | 12:05 |
| ELF-8 | 2005312-11 | | WATER | 13-May-20 | 9:45 |
| ELF-9 | 2005312-12 | | WATER | 13-May-20 | 13:00 |
| Group B - DUP | 2005312-13 | | WATER | 12-May-20 | |
| Group B - Blank | 2005312-14 | | WATER | 13-May-20 | 11:20 |

**American West
Analytical Laboratories**

3440 S. 700 W. Salt Lake City, UT 84119

Phone # (501) 263-8686 Toll Free # (866) 263-8686

Fax = (801) 263-8687 Email: ajwal@ajwal-labs.com

www.awal-labs.com

CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (POL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

AWAL Lab Sample Set #

Page 1 of 4

Client: **American West Analytical Laboratories**

Address: **3440 S. 700 W.**

City, State, Zip: **Salt Lake City , UT 84119**

Contact: **Elona Hayward**

Phone #: **(801) 263-8686** Cell #: _____

E-mail: **elona@awal-labs.com; denise@awal-labs.com**

Project Name: **Hunter CCR Groundwater Sampling**

Project #: **PERCM052**

PO #: **2005382**

Sampler Name: _____

[illegible]

| | | |
|-------------------------------|--------------|------------|
| Relinquished by:
Signature | Denise Brown | 5/18/20 |
| Print Name: | Denise Brown | Time: 8:30 |
| Relinquished by:
Signature | | Date: |
| Print Name: | | Time: |
| Relinquished by:
Signature | | Date: |
| Print Name: | | Time: |

| | | | |
|---------------------------|--------------------|-------|--|
| Received by:
Signature | <i>Amy Kephart</i> | Date: | |
| Print Name: | <i>Amy Kephart</i> | Time: | |
| Received by:
Signature | | Date: | |
| Print Name: | | Time: | |
| Received by:
Signature | | Date: | |
| Print Name: | | Time: | |

| |
|---|
| Special Instructions: |
| QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS,
MS/MSD performed on customer sample |
| |
| Samples sent to ALS - Ft. Collins. |
| |



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: American West Analytical Labs

Workorder No: 2005312

Project Manager: KMO

Initials: AK

Date: 05/21/2020

| | | | | | | |
|--|-------------------------------------|---------------------|-------------------------------------|----------|-------------------------------------|--|
| 1. Are airbills / shipping documents present and/or removable? | <input type="checkbox"/> | DROP OFF | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO |
| 2. Are custody seals on shipping containers intact? | <input checked="" type="checkbox"/> | NONE | <input checked="" type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO * |
| 3. Are custody seals on sample containers intact? | <input checked="" type="checkbox"/> | NONE | <input type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 4. Is there a COC (chain-of-custody) present? | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.) | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 6. Are short-hold samples present? | <input type="checkbox"/> | | <input type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO |
| 7. Are all samples within holding times for the requested analyses? | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 8. Were all sample containers received intact? (not broken or leaking) | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 9. Is there sufficient sample for the requested analyses? | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines) | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | YES | <input type="checkbox"/> | NO * |
| 11. Are all aqueous samples preserved correctly, if required? (excluding volatiles) | <input type="checkbox"/> | N/A | <input checked="" type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO * |
| 12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea) | <input checked="" type="checkbox"/> | N/A | <input type="checkbox"/> | YES | <input type="checkbox"/> | NO |
| 13. Were the samples shipped on ice? | <input type="checkbox"/> | | <input type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO |
| 14. Were cooler temperatures measured at 0.1-6.0°C? | <input type="checkbox"/> | IR gun used*: #3 #5 | <input checked="" type="checkbox"/> | RAD ONLY | <input type="checkbox"/> | YES <input checked="" type="checkbox"/> NO |
| Cooler #: 1 2 | | | | | | |
| Temperature (°C): AMB AMB | | | | | | |
| # of custody seals on cooler: | | | | | | |
| External mR/hr reading: 9 9 | | | | | | |
| Background mR/hr reading: 11 | | | | | | |
| Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.) | | | | | | |

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Sample 312-1-2 limited volume

Sample 312-6-2 limited Volume

Samples below had a pH >2; listed are sample-bottle numbers & amount of HNO₃ (lot # 234822) added to achieve the pH < 2.

312-2-1,2: 1.0ml

312-3-1,2: 1.0ml

312-8-1,2: 4.0ml

Were unpreserved bottles pH checked? YES / NA ☒

All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? YES / NO / NA Contact: _____

Date/Time: _____

Project Manager Signature / Date: [Signature] 5/21/20

62UPS Internet Shipping: View/Print Label

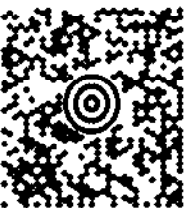

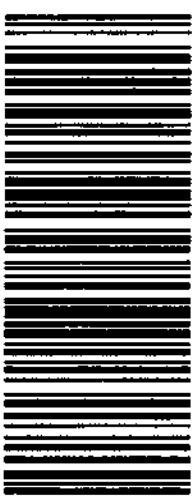

1. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
3. GETTING YOUR SHIPMENT TO UPS
 - Customers with a Daily Pickup
 - Your driver will pickup your shipment(s) as usual.
 - Customers without a Daily Pickup
 - Take your package to any location of The UPS Store®, UPS Access Point™ location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
 - Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages. Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 10741
4082 S REDWOOD RD
SALT LAKE CITY, UT 84123

UPS Access Point™
THE UPS STORE
1935 W 4700 S
TAYLORSVILLE, UT 84129

UPS Access Point™
THE UPS STORE
869 E 4500 S
SALT LAKE CITY, UT 84107

FOLD HERE

| | | |
|--|--|-------------|
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | 26 LBS | 4 OF 4 |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
AJS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524-2762 | DWT: 26.15, 13
AH | |
|  |  | CO 805 0-01 |
| UPS GROUND | | |
| TRACKING #: 1Z 9E7 258 03 9025 6915 | | |
|  | | |
| BILLING: P/P | | |
| UPS 22.0.11. WNTNVS0 28.04.04/2020 | | |
|  | | |

1. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. GETTING YOUR SHIPMENT TO UPS

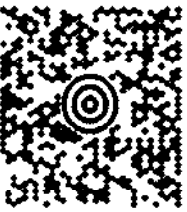



Customers with a Daily Pickup
Your driver will pickup your shipment(s) as usual.

Customers without a Daily Pickup

Take your package to any location of The UPS Store®, UPS Access Point™ location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services® (SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at [ups.com](https://www.ups.com).
Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages. Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 10741
4082 S REDWOOD RD
SALT LAKE CITY, UT 84123
UPS Access Point™
THE UPS STORE
1935 W 4700 S
TAYLORSVILLE, UT 84129
UPS Access Point™
THE UPS STORE
869 E 4500 S
SALT LAKE CITY, UT 84107

FOLD HERE

| | | |
|--|--------|--------|
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | 41 LBS | 1 OF 4 |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
ALS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524-2762 | | |
| 

CO 805 0-01 | | |
| UPS GROUND
TRACKING #: 1Z 9E7 258 03 9467 3289 | | |
|  | | |
| BILLING: P/P | | |
| US 22.0.1.1. WNTDVS90 28 0A 04/2020  | | |

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200529-1MB

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 29-May-20

Date Prepared: 29-May-20

Date Analyzed: 04-Jun-20

Prep Batch: RA200529-1

QCBatchID: RA200529-1-2

Run ID: RA200529-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0604

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 15262-20-1 | Ra-228 | 0.17 +/- 0.32 | 0.70 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 34400 | 33050 | ug | 96.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200601-1MB

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 01-Jun-20

Date Prepared: 01-Jun-20

Date Analyzed: 05-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 15262-20-1 | Ra-228 | 0.18 +/- 0.35 | 0.75 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33870 | 32000 | ug | 94.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 2 of 2

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200529-1LCS

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 29-May-20

Date Prepared: 29-May-20

Date Analyzed: 04-Jun-20

Prep Batch: RA200529-1

QCBatchID: RA200529-1-2

Run ID: RA200529-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0604

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 26.7 +/- 6.2 | 0.7 | 24.63 | 108 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 34400 | 32700 | ug | 95.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 1 of 4

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200529-1LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 29-May-20

Date Prepared: 29-May-20

Date Analyzed: 04-Jun-20

Prep Batch: RA200529-1

QCBatchID: RA200529-1-2

Run ID: RA200529-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0604

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 25.6 +/- 5.9 | 0.7 | 24.63 | 104 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 34400 | 33130 | ug | 96.3 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200601-1LCS

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 01-Jun-20

Date Prepared: 01-Jun-20

Date Analyzed: 05-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 24.9 +/- 5.8 | 0.8 | 24.62 | 101 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33870 | 32290 | ug | 95.3 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Lab ID: RA200601-1LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 01-Jun-20

Date Prepared: 01-Jun-20

Date Analyzed: 05-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 20.4 +/- 4.8 | 0.7 | 24.62 | 82.8 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33870 | 32010 | ug | 94.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2005312-1

Date Printed: Tuesday, June 16, 2020

ALS -- Fort Collins

LIMS Version: 7.010

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Radium-228 Analysis by GFPC

PAI 724 Rev 14

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID:
Lab ID: RA200529-1LCSD

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 29-May-20
Date Prepared: 29-May-20
Date Analyzed: 04-Jun-20

Prep Batch: RA200529-1
QCBatchID: RA200529-1-2
Run ID: RA200529-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0604

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|--------------|---------|-----|-------|--------------|---------|-----|-------|-------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 15262-20-1 | Ra-228 | 26.7 +/- 6.2 | | 0.7 | P | 25.6 +/- 5.9 | | 0.7 | P | 0.126 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID:
Lab ID: RA200601-1LCSD

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 01-Jun-20
Date Prepared: 01-Jun-20
Date Analyzed: 05-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|--------------|---------|-----|-------|--------------|---------|-----|-------|-------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 15262-20-1 | Ra-228 | 24.9 +/- 5.8 | | 0.8 | P | 20.4 +/- 4.8 | | 0.7 | P | 0.606 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-10
Lab ID: 2005312-1

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 12-May-20
Date Prepared: 29-May-20
Date Analyzed: 16-Jun-20

Prep Batch: RA200529-1
QCBatchID: RA200529-1-2
Run ID: RA200529-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0604

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.41 | 0.72 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.41 +/- 0.71 | 0.72 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 34420 | 31250 | ug | 90.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-11
Lab ID: 2005312-2

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 12-May-20
Date Prepared: 01-Jun-20
Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.67 | 0.71 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.27 +/- 0.68 | 0.71 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33890 | 32360 | ug | 95.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-12
Lab ID: 2005312-3

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 12-May-20
Date Prepared: 01-Jun-20
Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 3.12 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 3.12 +/- 0.86 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 32090 | ug | 94.7 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-13

Lab ID: 2005312-4

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 12-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.49 | 0.72 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.07 +/- 0.64 | 0.72 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 31700 | ug | 93.6 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-14

Lab ID: 2005312-5

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 12-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.22 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.88 +/- 0.60 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33890 | 31800 | ug | 93.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-1D
Lab ID: 2005312-6

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 13-May-20
Date Prepared: 29-May-20
Date Analyzed: 16-Jun-20

Prep Batch: RA200529-1
QCBatchID: RA200529-1-2
Run ID: RA200529-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0604

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.2 | 0.8 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.69 +/- 0.59 | 0.80 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 34430 | 28870 | ug | 83.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-2
Lab ID: 2005312-7

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 13-May-20
Date Prepared: 01-Jun-20
Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.17 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.17 +/- 0.66 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 32400 | ug | 95.6 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-3
Lab ID: 2005312-8

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 13-May-20
Date Prepared: 01-Jun-20
Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|-----|---------------|----|---------------|
| | COMBINED RA (226+228) | 5.41 | 1.1 | 1 | NA | |
| 15262-20-1 | Ra-228 | 4.7 +/- 1.3 | 1.1 | 1 | NA | M3 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33910 | 22740 | ug | 67.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-4
Lab ID: 2005312-9

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 13-May-20
Date Prepared: 01-Jun-20
Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1
QCBatchID: RA200601-1-1
Run ID: RA200601-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.00 +/- 0.63 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 31640 | ug | 93.4 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-7

Lab ID: 2005312-10

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.73 | 0.76 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.20 +/- 0.49 | 0.76 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 32380 | ug | 95.6 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-8

Lab ID: 2005312-11

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.65 | 0.71 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.28 +/- 0.49 | 0.71 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 32710 | ug | 96.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: ELF-9

Lab ID: 2005312-12

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.56 | 0.77 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.56 +/- 0.56 | 0.77 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33890 | 31550 | ug | 93.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: Group B - DUP

Lab ID: 2005312-13

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 12-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.79 | 0.75 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.79 +/- 0.59 | 0.75 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33880 | 31780 | ug | 93.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2005312

Client Name: American West Analytical Labs

ClientProject ID: Hunter CCR Groundwater Sampling PERCM052

Field ID: Group B - Blank

Lab ID: 2005312-14

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-May-20

Date Prepared: 01-Jun-20

Date Analyzed: 07-Jun-20

Prep Batch: RA200601-1

QCBatchID: RA200601-1-1

Run ID: RA200601-1A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC0605

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 0 | 0.88 | 1 | NA | U |
| 15262-20-1 | Ra-228 | 0.34 +/- 0.42 | 0.88 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33870 | 32490 | ug | 95.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2005312-1

ATTACHMENT B:

Field Summary Report – October 2020 Event

Facility Name: Hunter Power Plant – CCR Landfill
Event Description: Assessment Monitoring
Event Dates: October 28-29, 2020
Field Personnel: Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite October 28, 2020 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-5
- ELF-6
- ELF-7
- ELF-8
- ELF-9

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

- Date fieldwork completed: 10/29/2020
- Dates unvalidated lab data received: 11/05/2020
- Data validation completion date: 01/07/2021

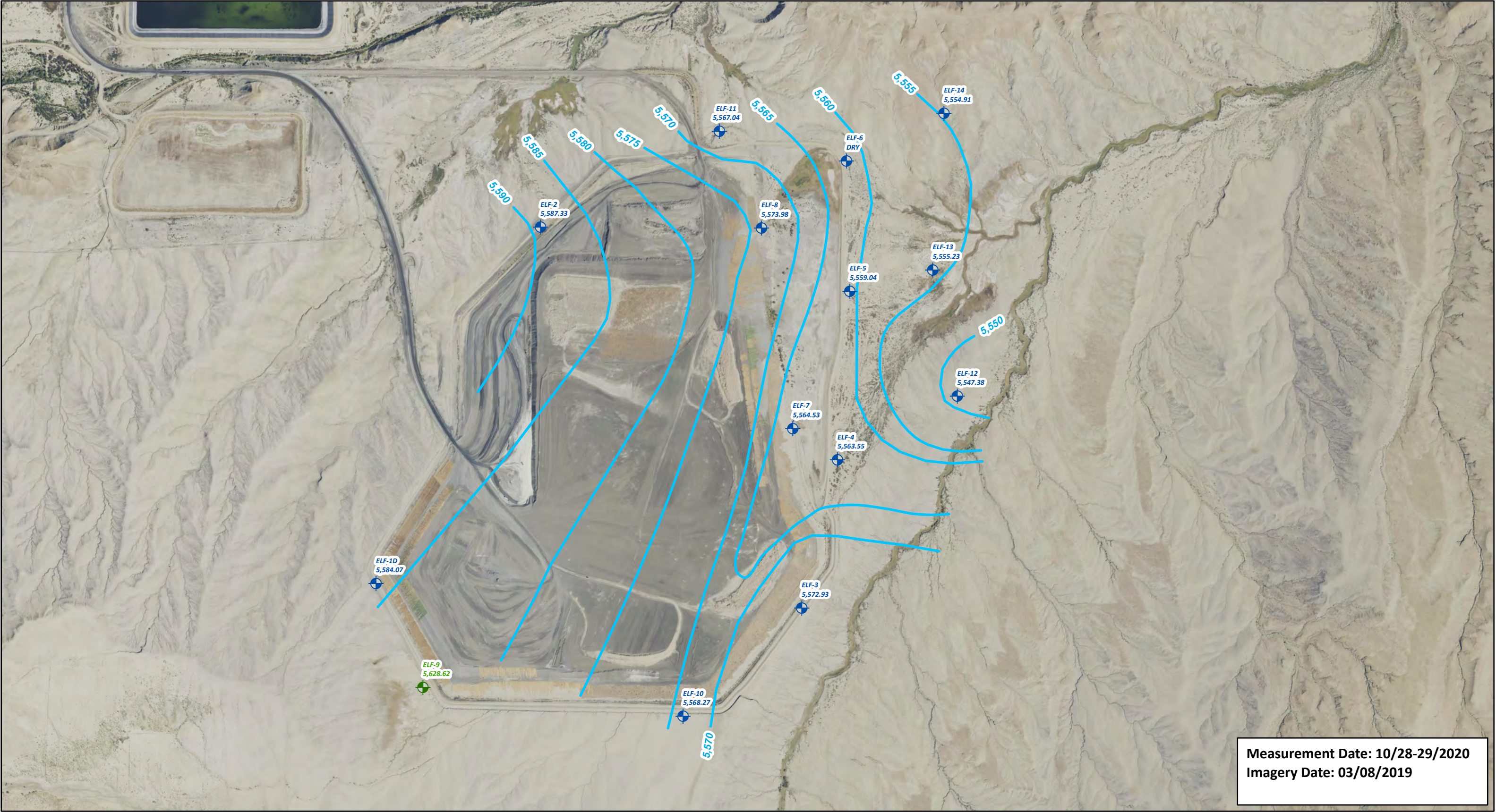
After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to American West Analytical Laboratories (AWAL) in Salt Lake City, Utah for analysis. Samples arrived at AWAL on 10/29/2020. AWAL subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 11/03/2020. 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-5, ELF-6, and ELF-7, and ELF-1D did not have enough water to sample.

Attachment A:

Groundwater Contour Map

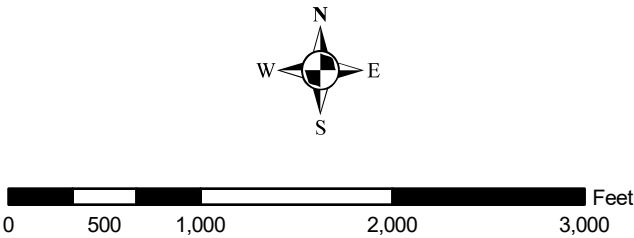


ELF-11= Well ID
5,567.04 = Water Level Elevation (ft.)

CCR Well

CCR Well - For Water Quality Only

Groundwater Elevation Contour
(Contour Interval = 5 Ft.)



| | |
|--|---------------------|
| HUNTER POWER PLANT | |
| <i>Groundwater Elevation Map
CCR Landfill</i> | |
| Job#: PERCM052 | Attachment A |
| Date: 12/2/2020 | |
| Path: M:\PERC_CCR2020_CCR_Sampling\Hunter\OCTOBER_2020\HUNTER_FALL2020.aprx, Author: jleprosse | |

Attachment B:

Data Validation Summary

**DATA VALIDATION SUMMARY
CCR COMPLIANCE SAMPLING**

| | | |
|---|---|---|
| Facility Name: | Hunter Power Plant | |
| Validator: | Janelle Garza (1/8/2021) | |
| Reviewer: | Marcus Holland (1/11/2021) | |
| Laboratory: | American West Analytical Laboratories; Salt Lake City, UT
ALS Laboratories; Fort Collins, CO (third party lab for Ra analyses) | |
| Laboratory Work Order#: | 2010965 | |
| Sample Media: | Aqueous | |
| Review Element: | Complete /
Criteria
Met?
(Yes/No) | If no, describe: |
| Chain of Custody: | No | No time was entered for the duplicate sample. |
| Field Documentation: | Yes | |
| Holding Times &
Sample Preservation: | No | pH was analyzed past the 15-minute holding time. All samples were qualified as estimated (J). |
| Calibrations: | Yes | |
| Blanks: | No | Field:
❖ Field Blank (representing all samples):
➤ TDS was detected at 40 mg/L, above the limit of 10 mg/L.
▪ No qualification was required due to sample results $\geq 10\times$ blank. |
| Laboratory Control Sample: | Yes | |
| Duplicates: | Yes | |
| Matrix Spike: | No | Lab ID 2010965-002BMS (Sample ID ELF-11):
❖ Calcium was recovered at 138% and 137%, above the limits of 70-130%. The analyte concentration is too high for accurate MS %R and/or RPD. No qualification applied.
Lab ID 2010965-001BMS/D (Sample ID ELF-10):
❖ Mercury was recovered at 6.16% and 5.61%, below the limits of 80-120%. The method is in control as indicated by the LCS. No qualification applied. |
| Overall Assessment: | | |
| Out of 240 total data points, 230 data points (95.8%) remain unqualified, or were qualified as non-detect (U), and are considered quantitative. The remaining ten data points (4.2%) were qualified as estimated due to pH holding time exceedance and are considered qualitative data. No data points were rejected; thus, this sample delivery group is 100% complete and usable. | | |

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 wells associated with the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to compare upgradient with downgradient wells 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 with 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-5 |
| ELF-10 | ELF-6 |
| | ELF-7 |
| | ELF-8 |
| | ELF-11 |
| | ELF-12 |
| | ELF-13 |
| | ELF-14 |

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis was 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 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 2020).

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.

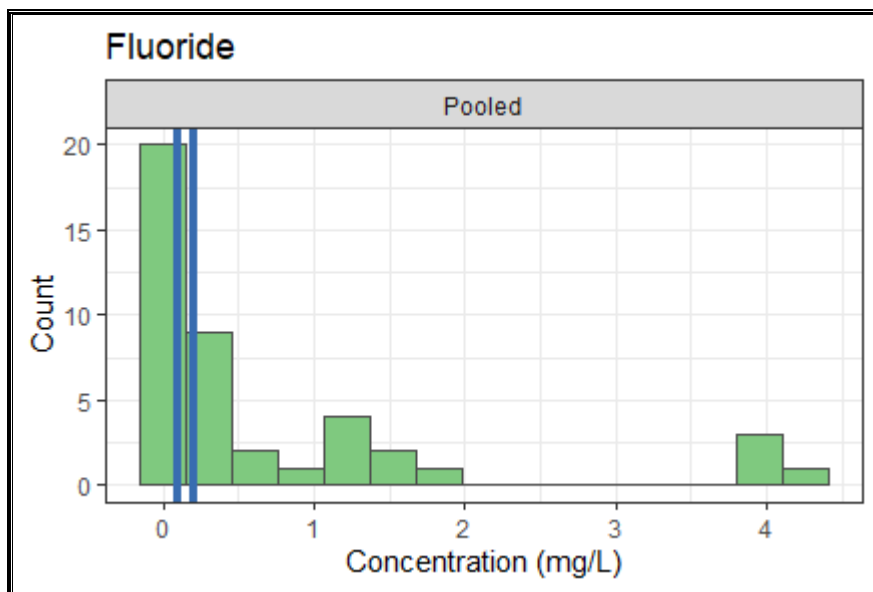


Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

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.

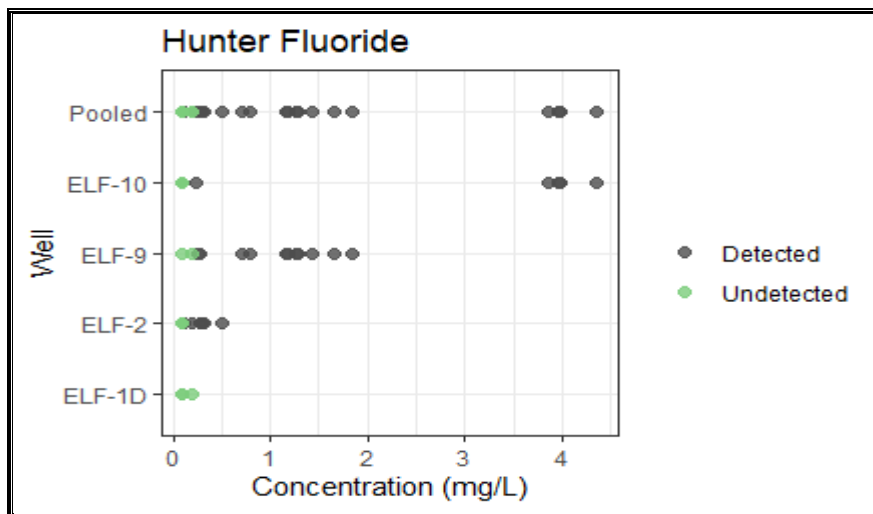


Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

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 cadmium, cobalt, lead, and radium data CCR Landfill data. However, none of the outliers are extreme enough to warrant removal from the dataset. The MDLs for the non-detects in the boron upgradient data 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 Groundwater Protection Standard (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.

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 arsenic, cadmium, chromium, cobalt, and lead data have more than 50% non-detects. Antimony, beryllium, mercury, and thallium were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The fluoride and selenium data have more than 15% non-detects, but more than half of the data are detected. 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 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. 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 (%) |
|---------|--------|-------------------|------------------|---------------|-------------|---------------------------|------------------------------|
| Arsenic | ELF-1D | 4 | 0 | <0.002 | NA | NA | NA |
| Arsenic | ELF-2 | 16 | 0 | <0.002 | NA | NA | NA |
| Arsenic | ELF-9 | 14 | 14 | 0.007 | 0.008 | 0.0021 | 28 |
| Arsenic | ELF-10 | 13 | 3 | <0.002 | NA | NA | NA |
| Arsenic | Pooled | 47 | 17 | <0.002 | NA | NA | NA |
| Barium | ELF-1D | 4 | 4 | 0.0094 | NA | NA | NA |
| Barium | ELF-2 | 16 | 15 | 0.0102 | 0.0136 | 0.0102 | 75 |
| Barium | ELF-9 | 14 | 14 | 0.0256 | 0.0401 | 0.0333 | 83 |
| Barium | ELF-10 | 13 | 13 | 0.0353 | 0.0402 | 0.0220 | 55 |
| Barium | Pooled | 47 | 46 | 0.0145 | 0.0285 | 0.0258 | 90 |
| Boron | ELF-1D | 3 | 3 | 2.19 | NA | NA | NA |
| Boron | ELF-2 | 15 | 15 | 3.33 | 3.36 | 0.18 | 5 |
| Boron | ELF-9 | 12 | 12 | 1.44 | 1.50 | 0.21 | 14 |
| Boron | ELF-10 | 12 | 12 | 1.61 | 1.66 | 0.17 | 10 |
| Boron | Pooled | 42 | 42 | 1.86 | 2.26 | 0.87 | 38 |
| Cadmium | ELF-1D | 4 | 0 | <0.0005 | NA | NA | NA |
| Cadmium | ELF-2 | 16 | 0 | <0.0005 | NA | NA | NA |
| Cadmium | ELF-9 | 14 | 1 | <0.0005 | NA | NA | NA |
| Cadmium | ELF-10 | 13 | 6 | <0.0005 | NA | NA | NA |
| Cadmium | Pooled | 47 | 7 | <0.0005 | NA | NA | NA |
| Calcium | ELF-1D | 3 | 3 | 366 | NA | NA | NA |
| Calcium | ELF-2 | 15 | 15 | 404 | 400 | 23.4 | 6 |
| Calcium | ELF-9 | 13 | 13 | 58.7 | 74.2 | 33.1 | 45 |
| Calcium | ELF-10 | 12 | 12 | 472 | 474 | 34.7 | 7 |
| Calcium | Pooled | 43 | 43 | 395 | 320 | 169 | 53 |

| Analyte | Well | Number of Samples | Samples Detected | Median (mg/L) | Mean (mg/L) | Standard Deviation (mg/L) | Coefficient of Variation (%) |
|------------|--------|-------------------|------------------|---------------|-------------|---------------------------|------------------------------|
| Chloride | ELF-1D | 3 | 3 | 6640 | NA | NA | NA |
| Chloride | ELF-2 | 15 | 15 | 439 | 369 | 115 | 31 |
| Chloride | ELF-9 | 13 | 13 | 391 | 404 | 92.3 | 23 |
| Chloride | ELF-10 | 12 | 12 | 7530 | 8254 | 2012 | 24 |
| Chloride | Pooled | 43 | 43 | 461 | 3018 | 3804 | 126 |
| Chromium | ELF-1D | 4 | 1 | <0.002 | NA | NA | NA |
| Chromium | ELF-2 | 16 | 2 | <0.002 | NA | NA | NA |
| Chromium | ELF-9 | 14 | 7 | 0.003 | NA | NA | NA |
| Chromium | ELF-10 | 13 | 10 | 0.003 | 0.005 | 0.004 | 84 |
| Chromium | Pooled | 47 | 20 | <0.002 | NA | NA | NA |
| Cobalt | ELF-1D | 4 | 1 | <0.004 | NA | NA | NA |
| Cobalt | ELF-2 | 16 | 9 | 0.0047 | 0.0054 | 0.0020 | 37 |
| Cobalt | ELF-9 | 14 | 2 | <0.004 | NA | NA | NA |
| Cobalt | ELF-10 | 13 | 10 | 0.0043 | 0.0050 | 0.0014 | 28 |
| Cobalt | Pooled | 47 | 22 | <0.004 | NA | NA | NA |
| Fluoride | ELF-1D | 3 | 0 | <0.1 | NA | NA | NA |
| Fluoride | ELF-2 | 15 | 7 | <0.1 | NA | NA | NA |
| Fluoride | ELF-9 | 13 | 11 | 1.16 | 0.94 | 0.59 | 63 |
| Fluoride | ELF-10 | 12 | 5 | <0.1 | NA | NA | NA |
| Fluoride | Pooled | 43 | 23 | 0.2 | 0.8 | 1.2 | 156 |
| Lead | ELF-1D | 4 | 0 | <0.002 | NA | NA | NA |
| Lead | ELF-2 | 16 | 1 | <0.002 | NA | NA | NA |
| Lead | ELF-9 | 14 | 4 | <0.002 | NA | NA | NA |
| Lead | ELF-10 | 13 | 6 | <0.002 | NA | NA | NA |
| Lead | Pooled | 47 | 11 | <0.002 | NA | NA | NA |
| Lithium | ELF-1D | 4 | 4 | 2.16 | NA | NA | NA |
| Lithium | ELF-2 | 16 | 16 | 1.68 | 2.38 | 1.23 | 52 |
| Lithium | ELF-9 | 14 | 14 | 0.881 | 1.05 | 0.474 | 45 |
| Lithium | ELF-10 | 13 | 13 | 2.17 | 2.33 | 1.06 | 45 |
| Lithium | Pooled | 47 | 47 | 1.61 | 1.95 | 1.10 | 56 |
| Molybdenum | ELF-1D | 4 | 4 | 0.0163 | NA | NA | NA |
| Molybdenum | ELF-2 | 16 | 15 | 0.0031 | 0.0032 | 0.0007 | 23 |
| Molybdenum | ELF-9 | 14 | 14 | 0.1150 | 0.1110 | 0.0267 | 24 |
| Molybdenum | ELF-10 | 13 | 13 | 0.0855 | 0.0827 | 0.0333 | 40 |
| Molybdenum | Pooled | 47 | 46 | 0.0546 | 0.0585 | 0.0520 | 89 |

| Analyte | Well | Number of Samples | Samples Detected | Median (mg/L) | Mean (mg/L) | Standard Deviation (mg/L) | Coefficient of Variation (%) |
|----------|--------|-------------------|------------------|---------------|-------------|---------------------------|------------------------------|
| pH | ELF-1D | 3 | 3 | 7.27 | NA | NA | NA |
| pH | ELF-2 | 15 | 15 | 7.24 | 7.30 | 0.17 | 2 |
| pH | ELF-9 | 13 | 13 | 7.94 | 7.90 | 0.15 | 2 |
| pH | ELF-10 | 12 | 12 | 7.18 | 7.27 | 0.43 | 6 |
| pH | Pooled | 43 | 43 | 7.30 | 7.47 | 0.39 | 5 |
| Radium | ELF-1D | 4 | 4 | 1.72 | NA | NA | NA |
| Radium | ELF-2 | 16 | 16 | 1.43 | 1.93 | 1.78 | 92 |
| Radium | ELF-9 | 14 | 14 | 1.37 | 1.43 | 0.58 | 41 |
| Radium | ELF-10 | 13 | 13 | 2.41 | 3.06 | 3.50 | 114 |
| Radium | Pooled | 47 | 47 | 1.50 | 2.08 | 2.18 | 105 |
| Selenium | ELF-1D | 4 | 0 | <0.002 | NA | NA | NA |
| Selenium | ELF-2 | 16 | 16 | 0.382 | 0.298 | 0.225 | 76 |
| Selenium | ELF-9 | 14 | 1 | <0.002 | NA | NA | NA |
| Selenium | ELF-10 | 13 | 9 | 0.009 | 0.088 | 0.132 | 149 |
| Selenium | Pooled | 47 | 26 | 0.004 | 0.127 | 0.194 | 154 |
| Sulfate | ELF-1D | 3 | 3 | 8640 | NA | NA | NA |
| Sulfate | ELF-2 | 15 | 15 | 7900 | 7591 | 694 | 9 |
| Sulfate | ELF-9 | 13 | 13 | 6530 | 6497 | 756 | 12 |
| Sulfate | ELF-10 | 12 | 12 | 17050 | 15428 | 4817 | 31 |
| Sulfate | Pooled | 43 | 43 | 7950 | 9506 | 4542 | 48 |
| TDS | ELF-1D | 3 | 3 | 27000 | NA | NA | NA |
| TDS | ELF-2 | 15 | 15 | 12000 | 11927 | 415 | 3 |
| TDS | ELF-9 | 13 | 13 | 10600 | 10755 | 804 | 7 |
| TDS | ELF-10 | 12 | 12 | 38000 | 37267 | 2478 | 7 |
| TDS | Pooled | 43 | 43 | 12000 | 19731 | 11864 | 60 |

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) |
|----------|--------|----------------|-----------------------|---------------|-----------------------|----------------|
| Arsenic | ELF-1D | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Arsenic | ELF-2 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 |
| Arsenic | ELF-9 | 0.005 | 0.0063 | 0.0068 | 0.0081 | 0.0117 |
| Arsenic | ELF-10 | <0.002 | <0.002 | <0.002 | <0.002 | 0.0093 |
| Arsenic | Pooled | <0.001 | <0.002 | <0.002 | 0.0058 | 0.0117 |
| Barium | ELF-1D | 0.0084 | 0.0084 | 0.0094 | 0.0103 | 0.0103 |
| Barium | ELF-2 | <0.0084 | 0.0094 | 0.0102 | 0.0122 | 0.0500 |
| Barium | ELF-9 | 0.0126 | 0.0135 | 0.0256 | 0.0678 | 0.1020 |
| Barium | ELF-10 | 0.0145 | 0.0205 | 0.0353 | 0.0519 | 0.0863 |
| Barium | Pooled | <0.0084 | 0.0104 | 0.0145 | 0.0372 | 0.1020 |
| Boron | ELF-1D | 2.10 | 2.15 | 2.19 | 2.21 | 2.23 |
| Boron | ELF-2 | 3.11 | 3.25 | 3.33 | 3.49 | 3.77 |
| Boron | ELF-9 | 1.27 | 1.34 | 1.44 | 1.58 | 1.91 |
| Boron | ELF-10 | 1.48 | 1.56 | 1.61 | 1.69 | 2.12 |
| Boron | Pooled | 1.27 | 1.55 | 1.86 | 3.25 | 3.77 |
| Cadmium | ELF-1D | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cadmium | ELF-2 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| Cadmium | ELF-9 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0005 |
| Cadmium | ELF-10 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | 0.0011 |
| Cadmium | Pooled | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0011 |
| Calcium | ELF-1D | 353 | 360 | 366 | 372 | 377 |
| Calcium | ELF-2 | 356 | 388 | 404 | 419 | 430 |
| Calcium | ELF-9 | 48.9 | 57 | 59 | 84 | 166 |
| Calcium | ELF-10 | 407 | 454 | 472 | 488 | 543 |
| Calcium | Pooled | 48.9 | 102 | 395 | 438 | 543 |
| Chloride | ELF-1D | 6430 | 6535 | 6640 | 6760 | 6880 |
| Chloride | ELF-2 | 197 | 234 | 439 | 459 | 473 |
| Chloride | ELF-9 | 282 | 352 | 391 | 446 | 595 |
| Chloride | ELF-10 | 5710 | 7080 | 7530 | 9068 | 12100 |
| Chloride | Pooled | 197 | 367 | 461 | 6835 | 12100 |
| Chromium | ELF-1D | <0.002 | <0.002 | <0.002 | 0.0021 | 0.0023 |
| Chromium | ELF-2 | <0.001 | <0.002 | <0.002 | <0.002 | 0.011 |
| Chromium | ELF-9 | <0.002 | <0.002 | 0.0028 | 0.0117 | 0.0201 |
| Chromium | ELF-10 | <0.002 | 0.0020 | 0.0030 | 0.0057 | 0.0164 |
| Chromium | Pooled | <0.001 | <0.002 | <0.002 | 0.0051 | 0.0201 |
| Cobalt | ELF-1D | <0.004 | <0.004 | <0.004 | 0.0044 | 0.0054 |

| Analyte | Well | Minimum
(mg/L) | First
Quartile
(mg/L) | Median
(mg/L) | Third
Quartile
(mg/L) | Maximum
(mg/L) |
|------------|--------|-------------------|-----------------------------|------------------|-----------------------------|-------------------|
| Cobalt | ELF-2 | <0.004 | <0.004 | 0.0047 | 0.0060 | 0.0114 |
| Cobalt | ELF-9 | <0.004 | <0.004 | <0.004 | <0.004 | 0.0052 |
| Cobalt | ELF-10 | <0.004 | 0.0041 | 0.0043 | 0.0055 | 0.0079 |
| Cobalt | Pooled | <0.004 | <0.004 | <0.004 | 0.0053 | 0.0114 |
| Fluoride | ELF-1D | <0.1 | <0.1 | <0.1 | <0.15 | <0.2 |
| Fluoride | ELF-2 | <0.1 | <0.1 | <0.1 | 0.235 | 0.500 |
| Fluoride | ELF-9 | <0.1 | 0.276 | 1.16 | 1.29 | 1.84 |
| Fluoride | ELF-10 | <0.1 | <0.1 | <0.1 | 3.90 | 4.36 |
| Fluoride | Pooled | <0.1 | <0.1 | 0.200 | 0.980 | 4.36 |
| Lead | ELF-1D | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Lead | ELF-2 | <0.001 | <0.002 | <0.002 | <0.002 | 0.002 |
| Lead | ELF-9 | <0.002 | <0.002 | <0.002 | 0.0038 | 0.0077 |
| Lead | ELF-10 | <0.002 | <0.002 | <0.002 | 0.0031 | 0.012 |
| Lead | Pooled | <0.001 | <0.002 | <0.002 | <0.002 | 0.012 |
| Lithium | ELF-1D | 1.96 | 2.08 | 2.16 | 2.19 | 2.20 |
| Lithium | ELF-2 | 1.34 | 1.52 | 1.68 | 3.61 | 4.93 |
| Lithium | ELF-9 | 0.724 | 0.765 | 0.881 | 1.06 | 2.48 |
| Lithium | ELF-10 | 0.841 | 1.76 | 2.17 | 2.90 | 4.59 |
| Lithium | Pooled | 0.724 | 1.08 | 1.61 | 2.20 | 4.93 |
| Molybdenum | ELF-1D | 0.0153 | 0.0159 | 0.0163 | 0.0175 | 0.0207 |
| Molybdenum | ELF-2 | <0.002 | 0.0029 | 0.0031 | 0.0035 | 0.0050 |
| Molybdenum | ELF-9 | 0.0657 | 0.1002 | 0.115 | 0.126 | 0.158 |
| Molybdenum | ELF-10 | 0.0331 | 0.0546 | 0.0855 | 0.115 | 0.124 |
| Molybdenum | Pooled | <0.002 | 0.0036 | 0.0546 | 0.111 | 0.158 |
| pH | ELF-1D | 7.02 | 7.15 | 7.27 | 7.29 | 7.30 |
| pH | ELF-2 | 7.12 | 7.19 | 7.24 | 7.36 | 7.76 |
| pH | ELF-9 | 7.51 | 7.86 | 7.94 | 8.03 | 8.06 |
| pH | ELF-10 | 6.85 | 7.00 | 7.18 | 7.31 | 8.37 |
| pH | Pooled | 6.85 | 7.19 | 7.30 | 7.84 | 8.37 |
| Radium | ELF-1D | 1.09 | 1.20 | 1.72 | 2.31 | 2.63 |
| Radium | ELF-2 | 0.61 | 0.92 | 1.43 | 2.20 | 8.10 |
| Radium | ELF-9 | 0.64 | 1.14 | 1.37 | 1.77 | 2.60 |
| Radium | ELF-10 | 0.46 | 1.14 | 2.41 | 3.10 | 14.2 |
| Radium | Pooled | 0.46 | 1.10 | 1.50 | 2.30 | 14.2 |
| Selenium | ELF-1D | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Selenium | ELF-2 | 0.0042 | 0.066 | 0.382 | 0.472 | 0.608 |

| Analyte | Well | Minimum (mg/L) | First Quartile (mg/L) | Median (mg/L) | Third Quartile (mg/L) | Maximum (mg/L) |
|----------|--------|----------------|-----------------------|---------------|-----------------------|----------------|
| Selenium | ELF-9 | <0.002 | <0.002 | <0.002 | <0.002 | 0.0042 |
| Selenium | ELF-10 | <0.002 | <0.002 | 0.009 | 0.146 | 0.410 |
| Selenium | Pooled | <0.002 | <0.002 | 0.0042 | 0.1775 | 0.608 |
| Sulfate | ELF-1D | 7730 | 8185 | 8640 | 8790 | 8940 |
| Sulfate | ELF-2 | 6030 | 7070 | 7900 | 8095 | 8370 |
| Sulfate | ELF-9 | 5460 | 5830 | 6530 | 6900 | 8030 |
| Sulfate | ELF-10 | 8610 | 10225 | 17050 | 19825 | 20700 |
| Sulfate | Pooled | 5460 | 6840 | 7950 | 9085 | 20700 |
| TDS | ELF-1D | 26800 | 26900 | 27000 | 27850 | 28700 |
| TDS | ELF-2 | 11300 | 11550 | 12000 | 12250 | 12600 |
| TDS | ELF-9 | 9420 | 10300 | 10600 | 11200 | 12000 |
| TDS | ELF-10 | 32900 | 35275 | 38000 | 38850 | 40300 |
| TDS | Pooled | 9420 | 11350 | 12000 | 33250 | 40300 |

3.0 UPGRAIDENT AND DOWNGRAIDENT 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, was 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 the outliers are present in the cadmium, cobalt, lead, pH, and radium 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 and radium. Non-parametric UTLs were computed for all of the analytes except for lithium and radium.

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

| Analyte | W-Statistic | P-Value | Normal |
|----------------------|-------------|---------|--------|
| Barium | 0.7627 | <0.0001 | No |
| Boron | 0.8220 | <0.0001 | No |
| Calcium | 0.7965 | <0.0001 | No |
| Chloride | 0.7097 | <0.0001 | No |
| Fluoride | 0.6083 | <0.0001 | No |
| Cube Root of Lithium | 0.9427 | 0.0225 | Yes |

| Analyte | W-Statistic | P-Value | Normal |
|--------------|-------------|---------|--------|
| Lithium | 0.8742 | 0.0001 | No |
| Molybdenum | 0.8531 | <0.0001 | No |
| pH | 0.9236 | 0.0071 | No |
| Radium | 0.5334 | <0.0001 | No |
| LN of Radium | 0.9479 | 0.0357 | Yes |
| Selenium | 0.6781 | <0.0001 | No |
| Sulfate | 0.7095 | <0.0001 | No |
| TDS | 0.7138 | <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 detected 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, molybdenum, sulfate, and total dissolved solids exceed the GWPS. Table C.5 list the GWPSs and the wells that exceed the GWPS for each analyte (Figure C.4). 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 |
|-------------------|------------------------------|----------------------------------|--|--|
| Boron | 3.77 | NA | 3.77 | ELF-4, ELF-8, ELF-11 |
| Calcium | 543 | NA | 543 | Within Limit |
| Chloride | 12100 | NA | 12100 | Within Limit |
| Fluoride Appx III | 4.36 | NA | 4.36 | Within Limit |
| pH Acidic Range | 6.85 | NA | 6.85 | Within Limit |
| pH Basic Range | 8.37 | NA | 8.37 | Within Limit |
| Sulfate | 20700 | NA | 20700 | ELF-3 |
| TDS | 40300 | NA | 40300 | ELF-3 |
| Antimony | 0.004 | 0.006 | 0.006 | Within Limit |
| Arsenic | 0.0117 | 0.01 | 0.0117 | Within Limit |
| Barium | 0.102 | 2.00 | 2.00 | Within Limit |
| Beryllium | 0.002 | 0.004 | 0.004 | Within Limit |
| Cadmium | 0.0011 | 0.005 | 0.005 | Within Limit |
| Chromium | 0.0201 | 0.1000 | 0.1000 | Within Limit |
| Cobalt | 0.0114 | 0.006 | 0.0114 | ELF-8, ELF-11 |
| Fluoride Appx IV | 4.36 | 4.00 | 4.36 | Within Limit |
| Lead | 0.012 | 0.015 | 0.015 | Within Limit |
| Lithium | 4.65 | 0.040 | 4.65 | Within Limit |
| Mercury | 0.00009 | 0.002 | 0.002 | Within Limit |
| Molybdenum | 0.158 | 0.100 | 0.158 | ELF-8 |
| Radium | 6.28 | 5.0 | 6.28 | Within Limit |
| Selenium | 0.608 | 0.1 | 0.608 | Within Limit |
| Thallium | 0.002 | 0.002 | 0.002 | Within Limit |

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 October 2020 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituents:

- boron
- sulfate
- total dissolved solids

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

- cobalt
- molybdenum

5.0 REFERENCES

EPA, 2009, “Statistical Analysis Of Groundwater Monitoring Data At RCRA Facilities Unified Guidance,” EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.

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

R Core Team, 2020, *R: A Language and Environment for Statistical Computing*, <https://www.R-project.org>, R Foundation for Statistical Computing, Vienna, Austria.

Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

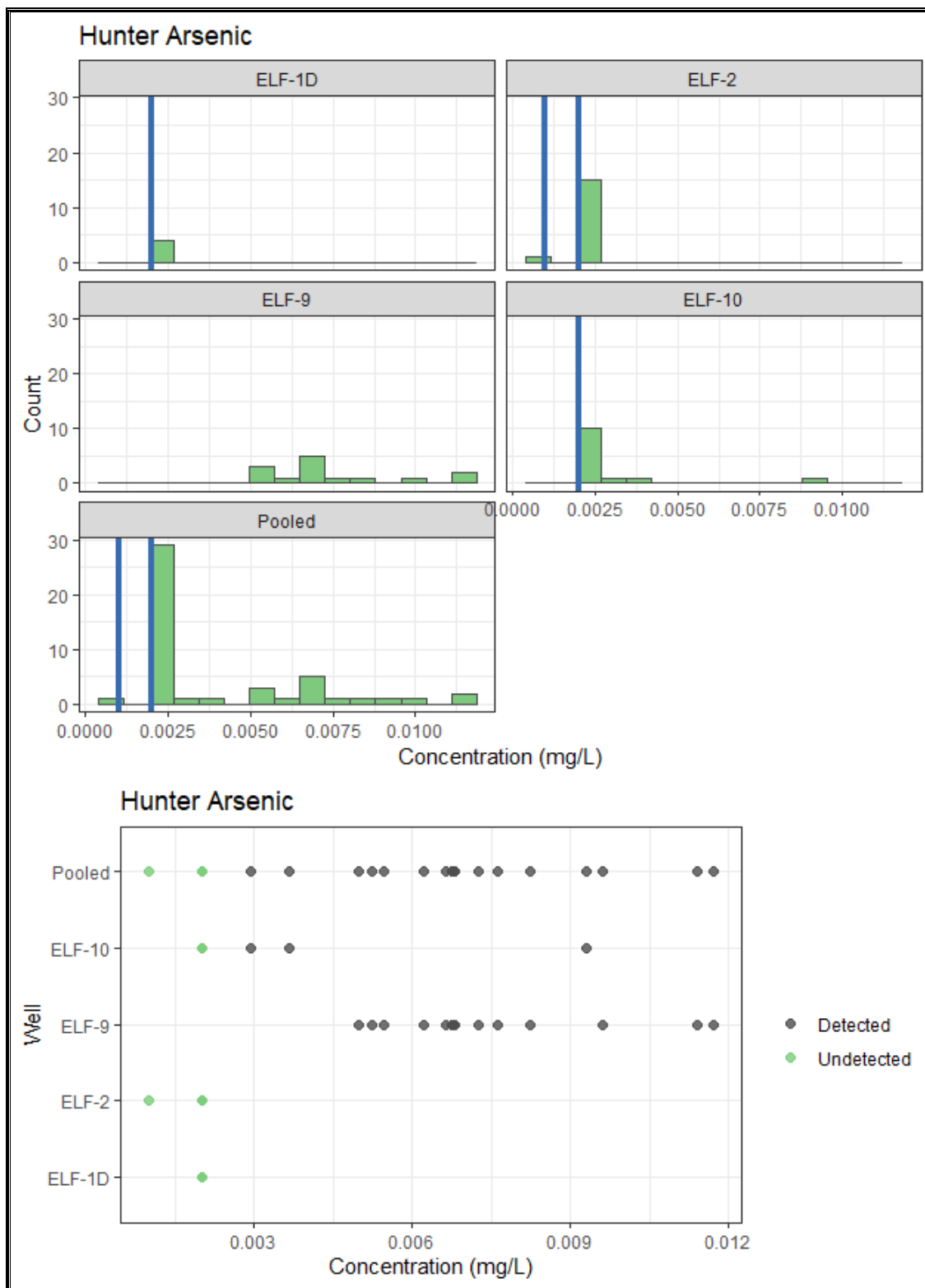


Figure C.3. Histograms and dot plots for the upgradient CCR Landfill data.

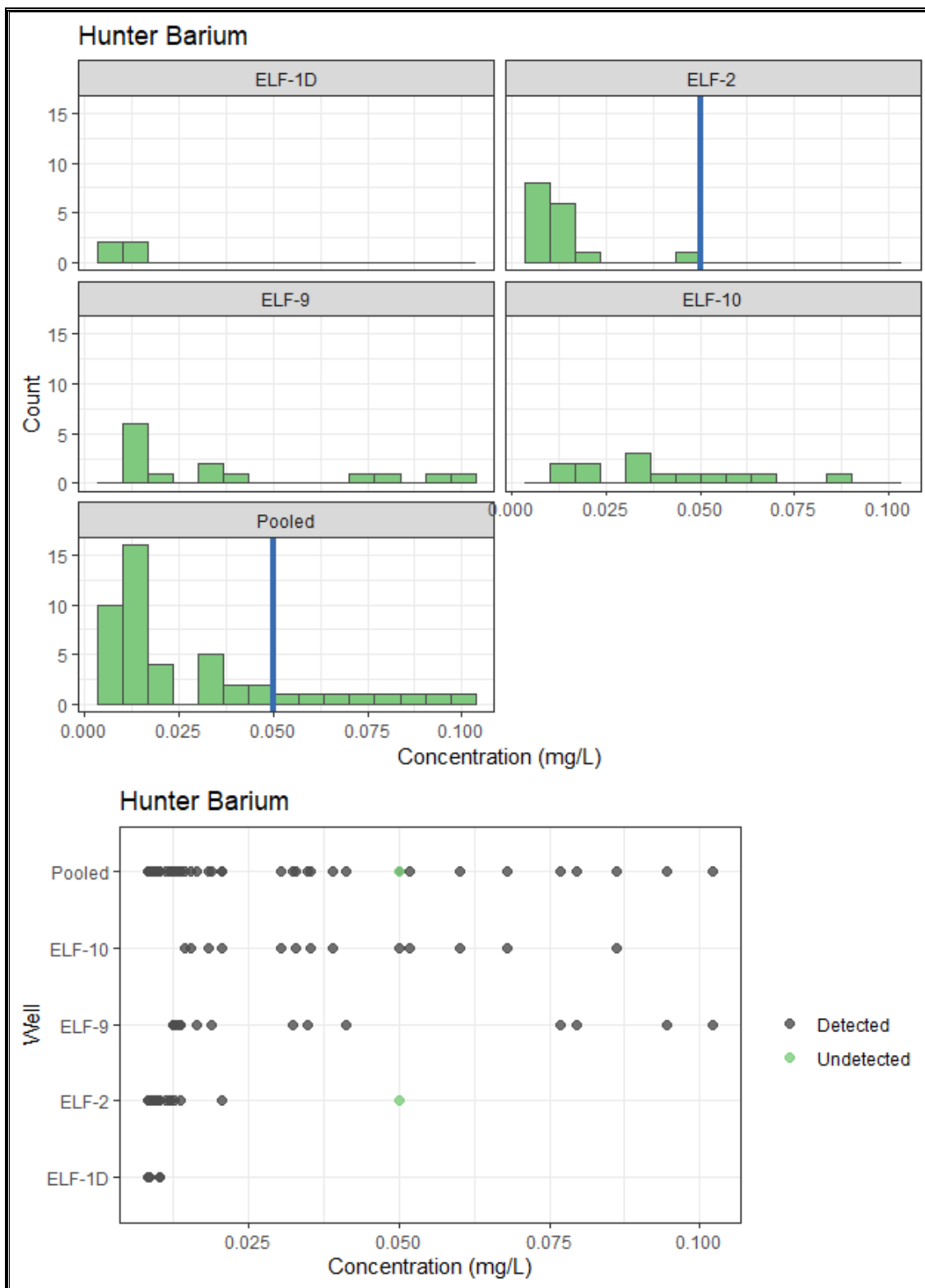


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

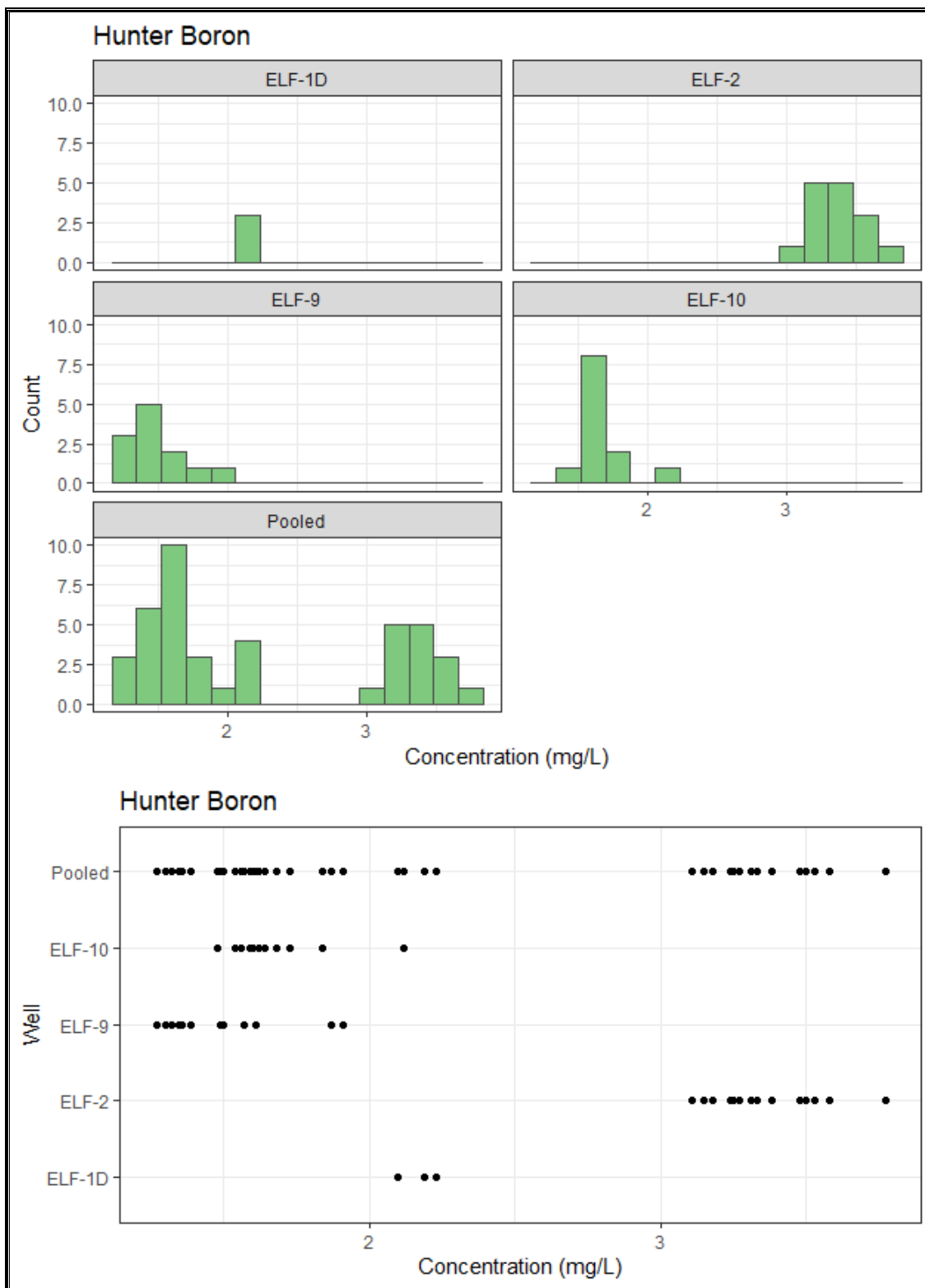


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

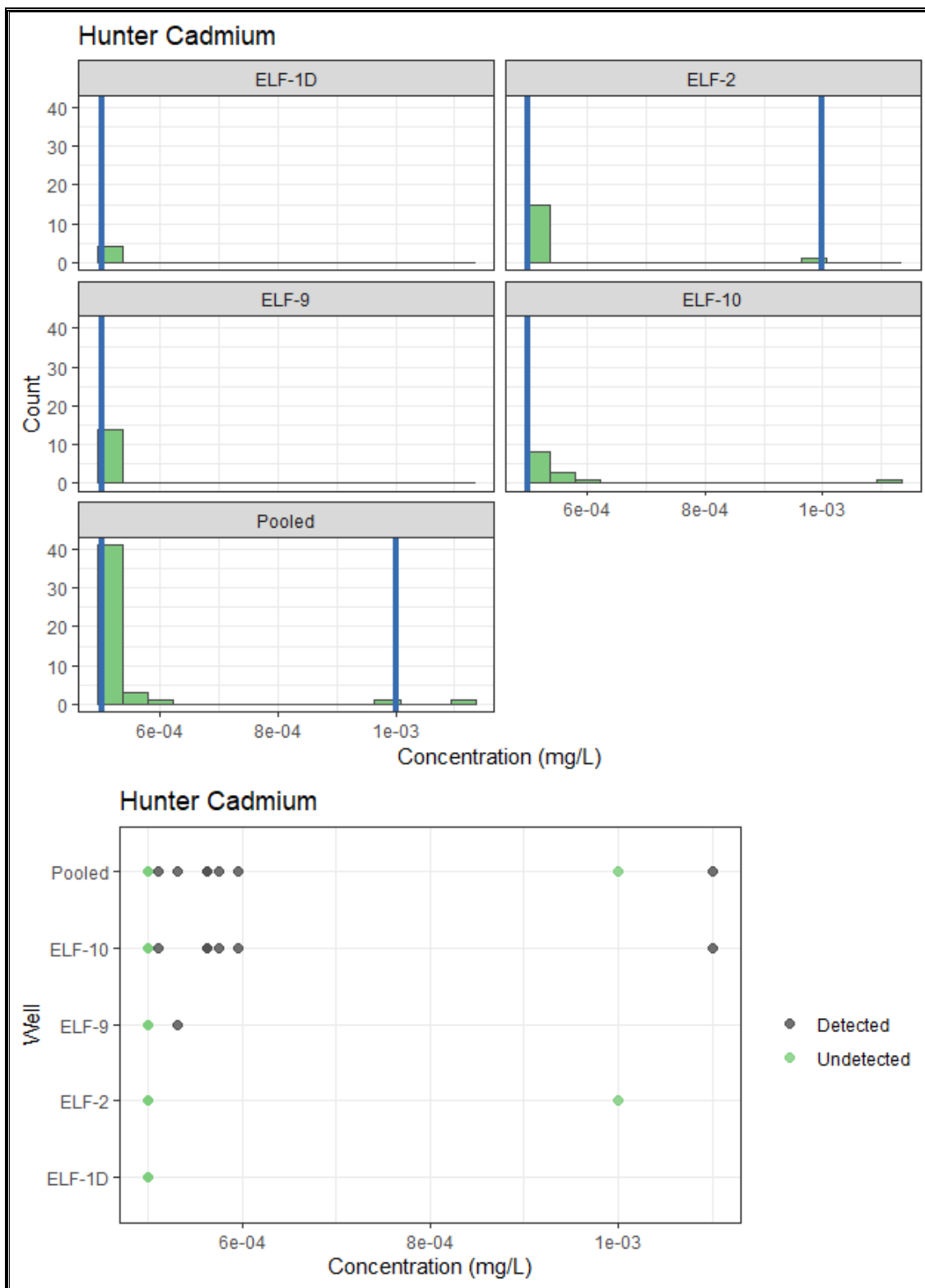


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

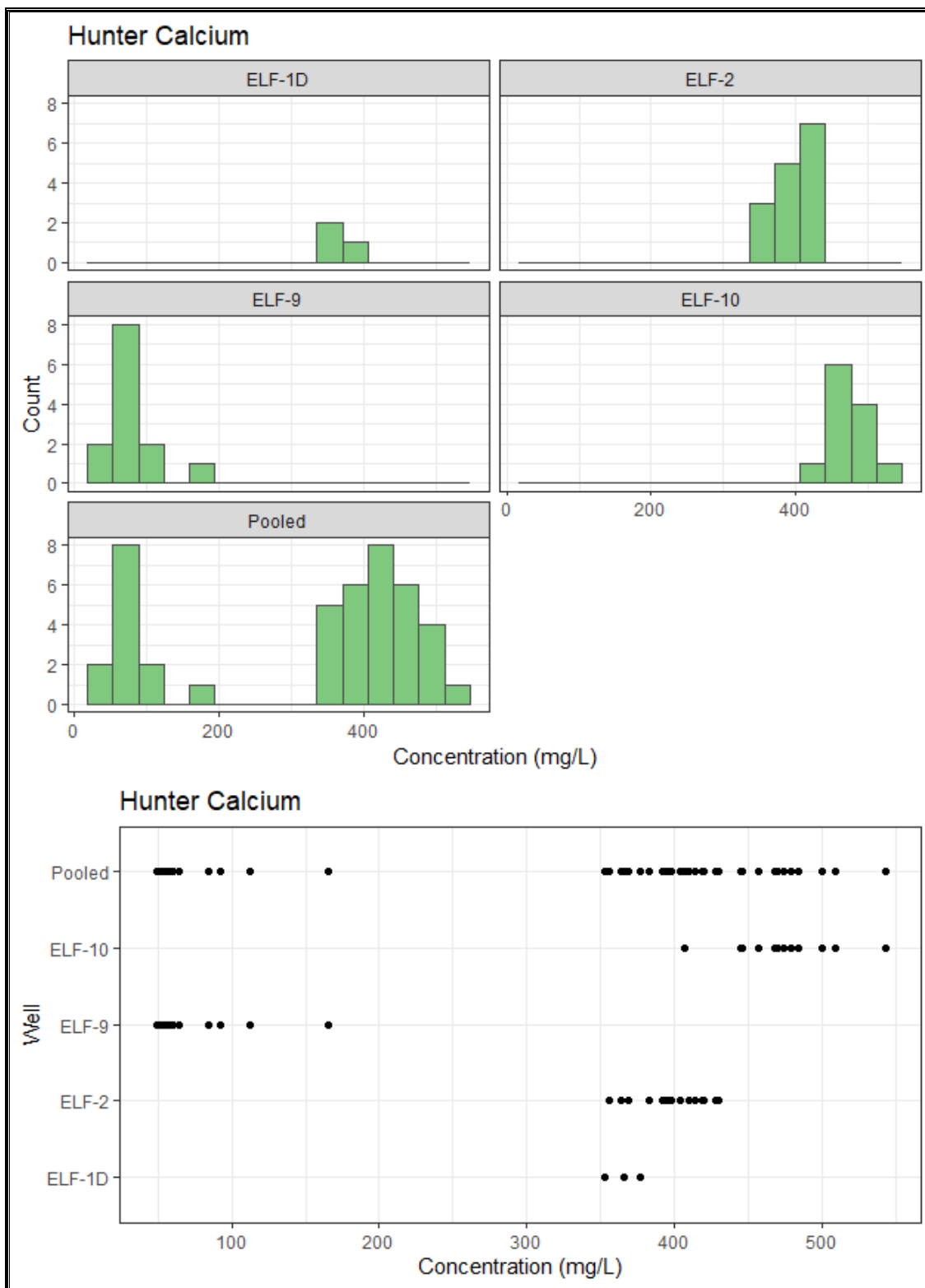


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

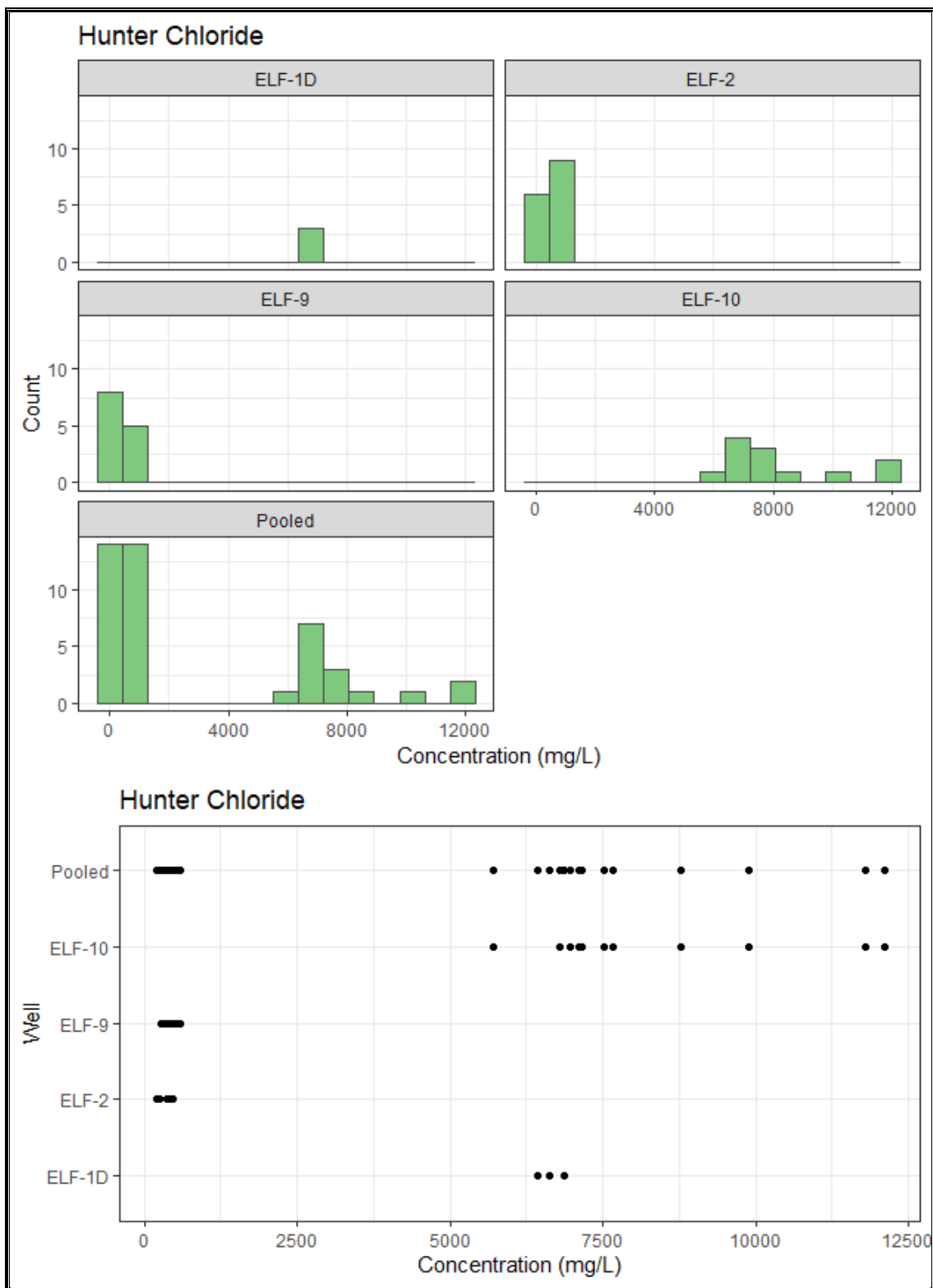


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

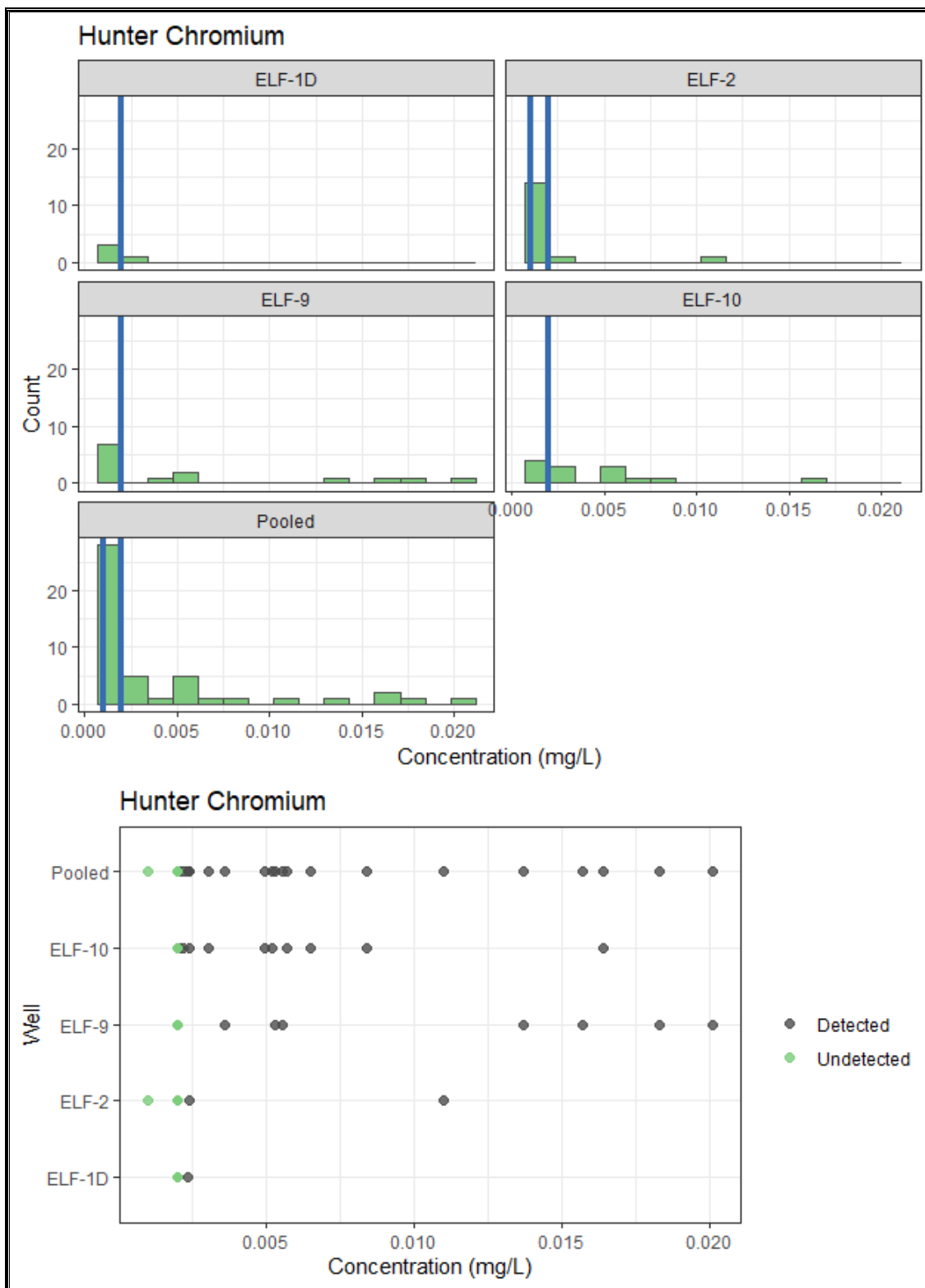


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

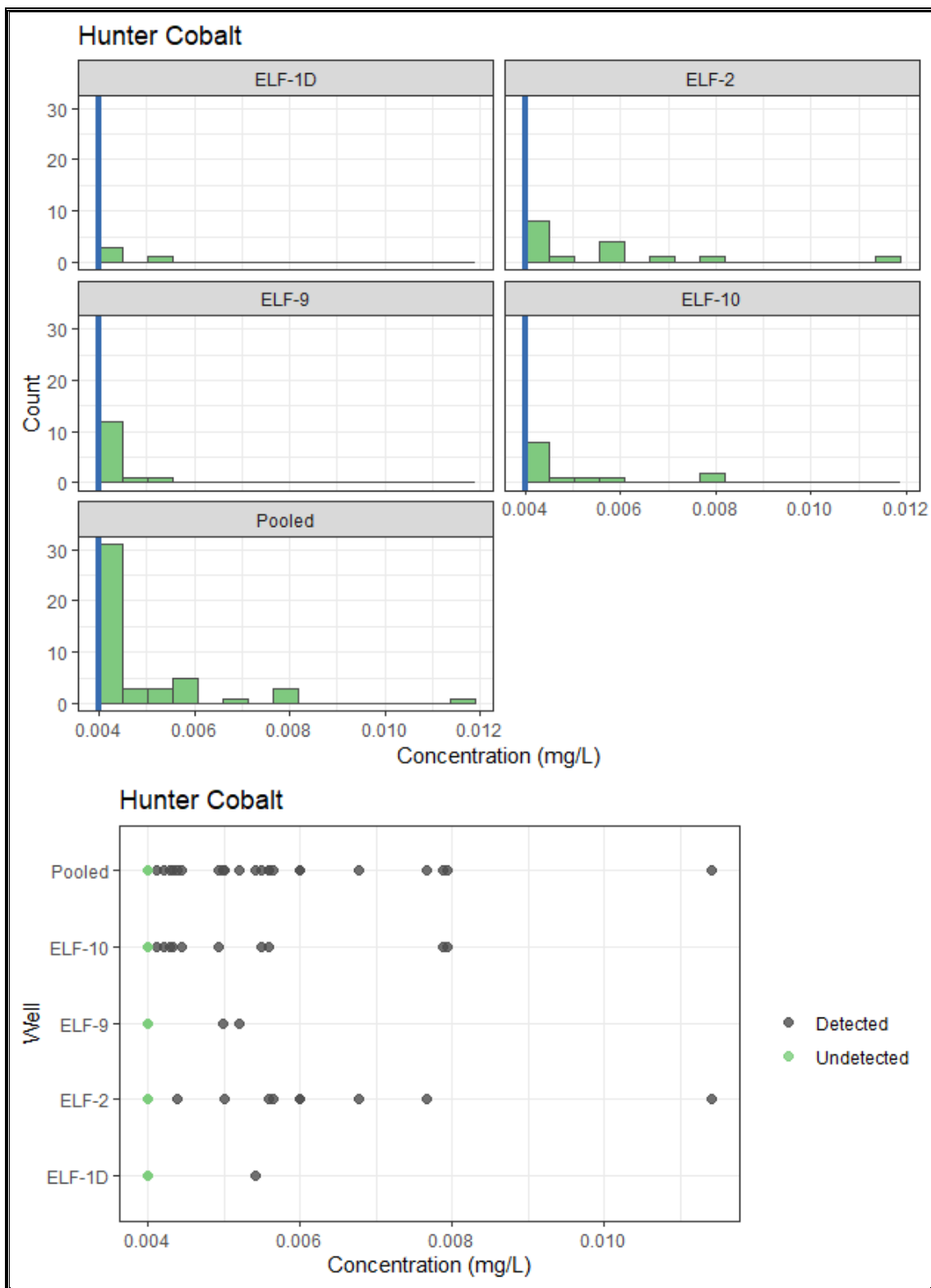


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

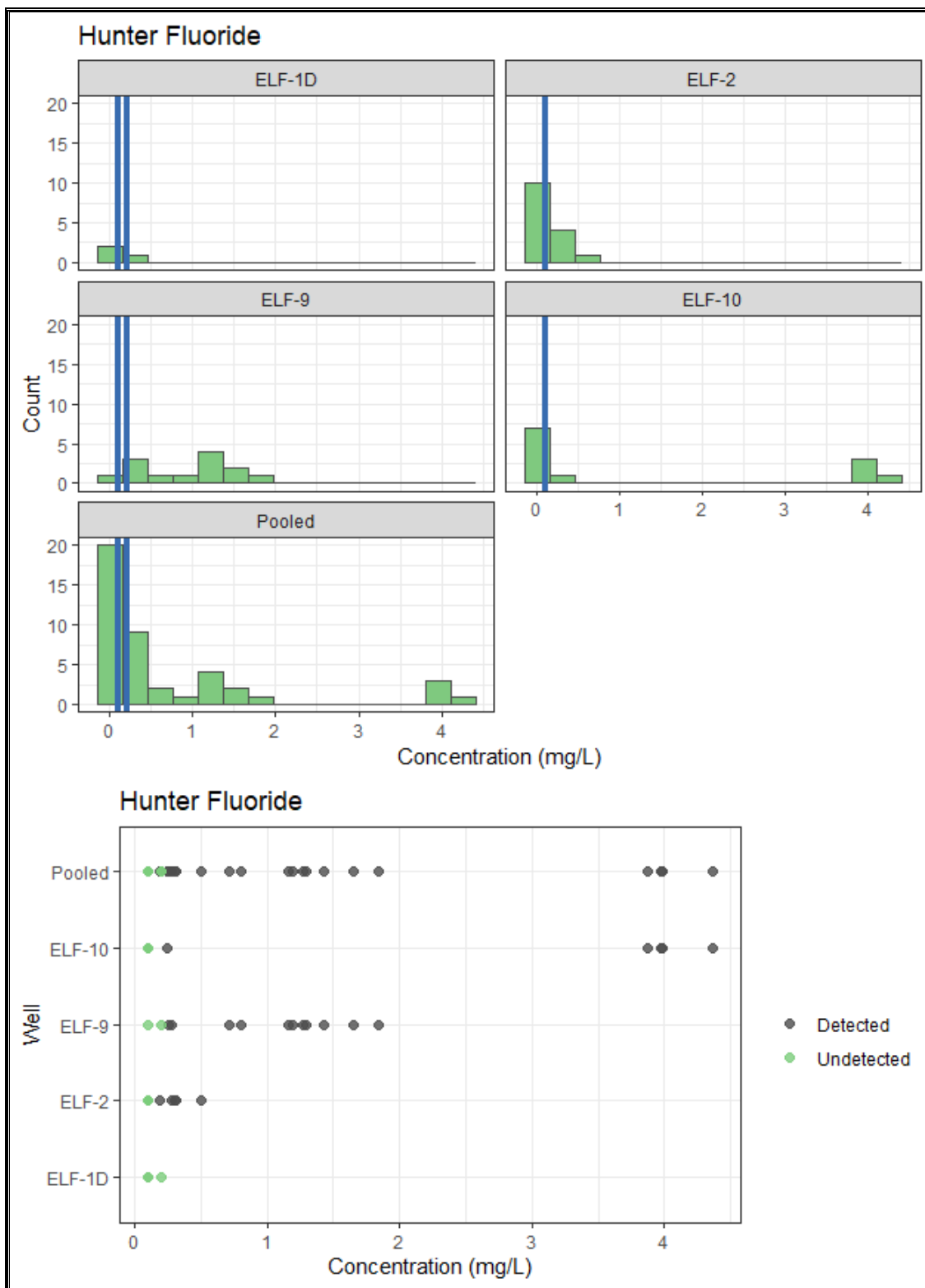


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

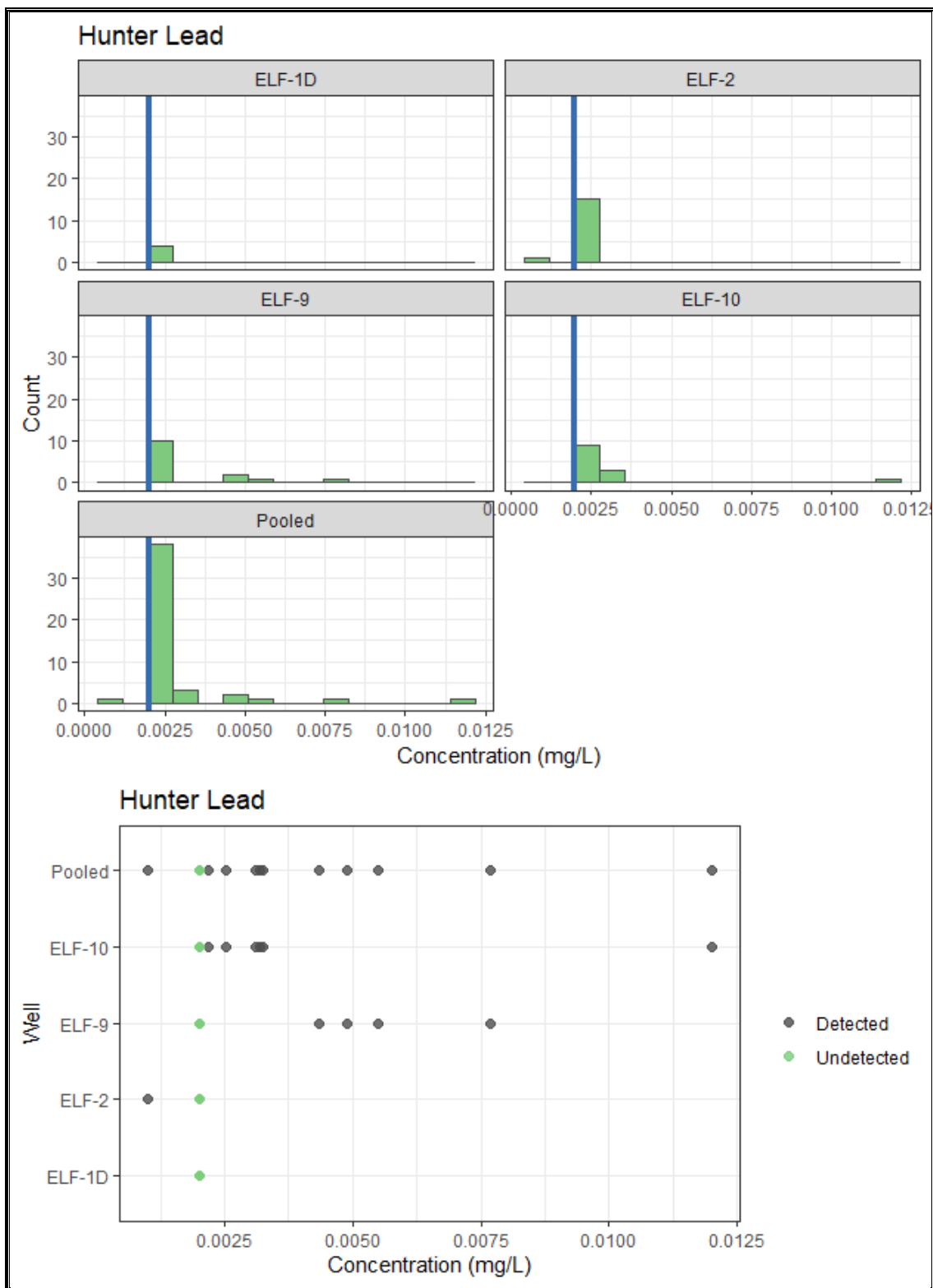


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

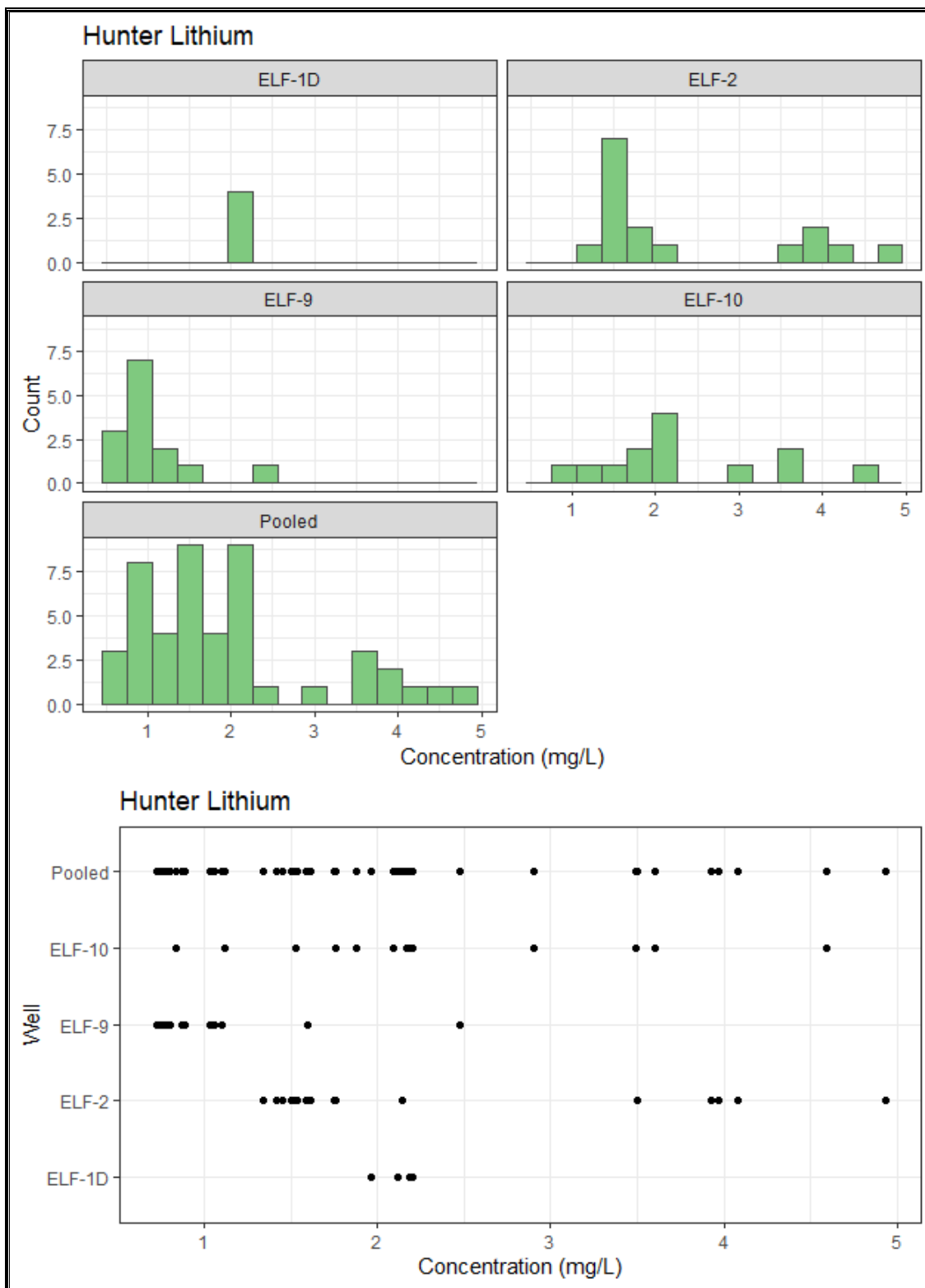


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

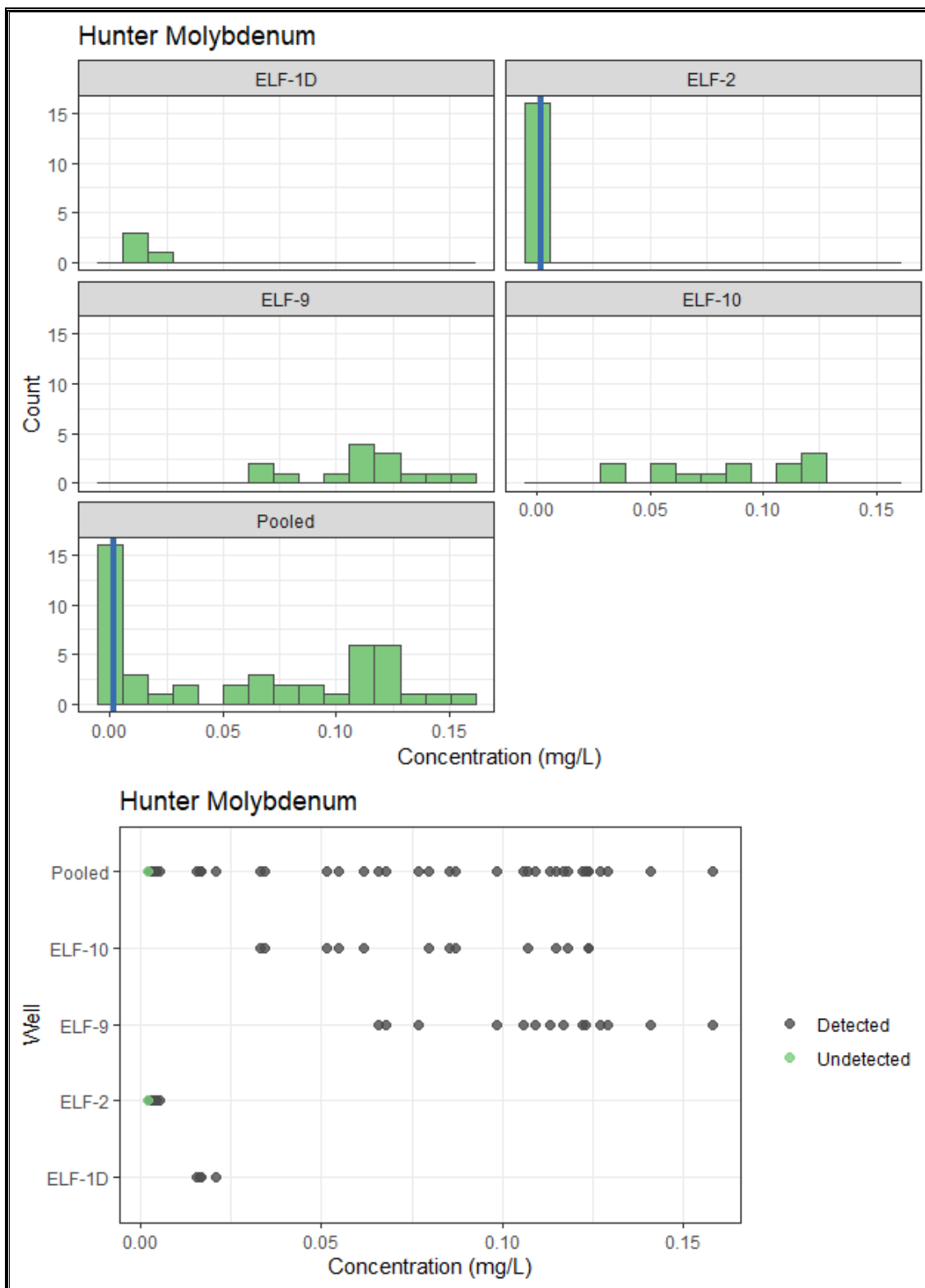


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

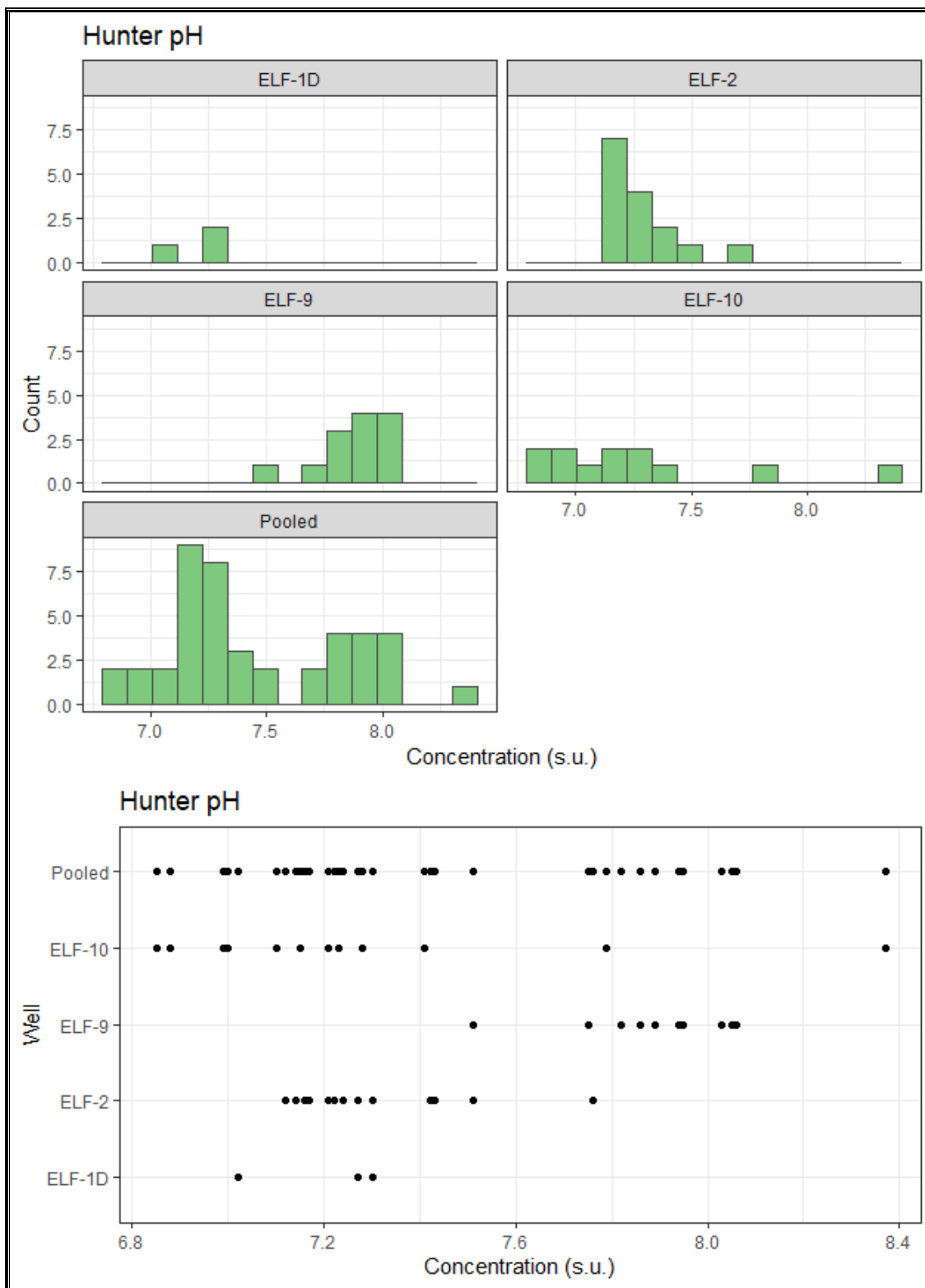


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

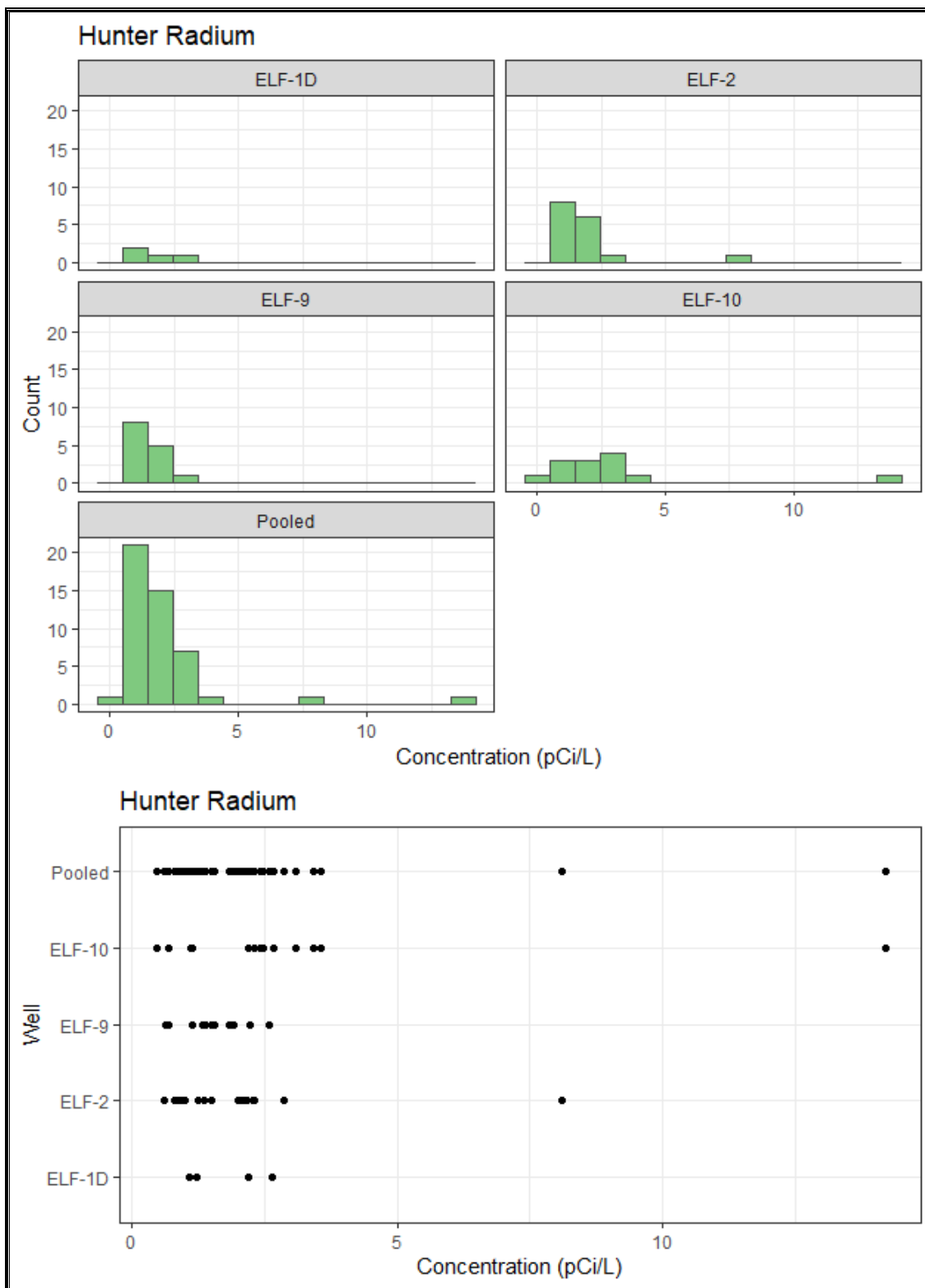


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

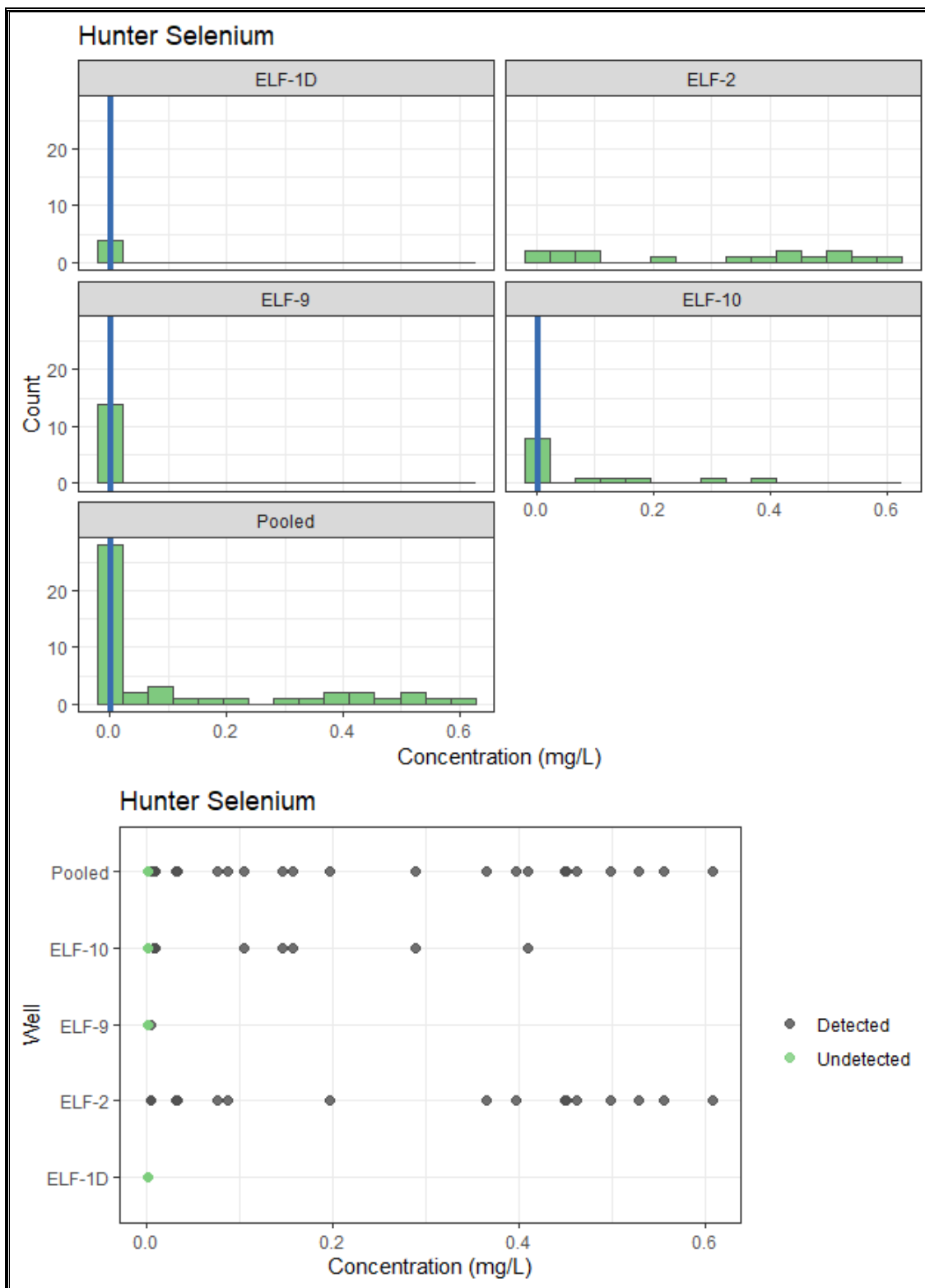


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

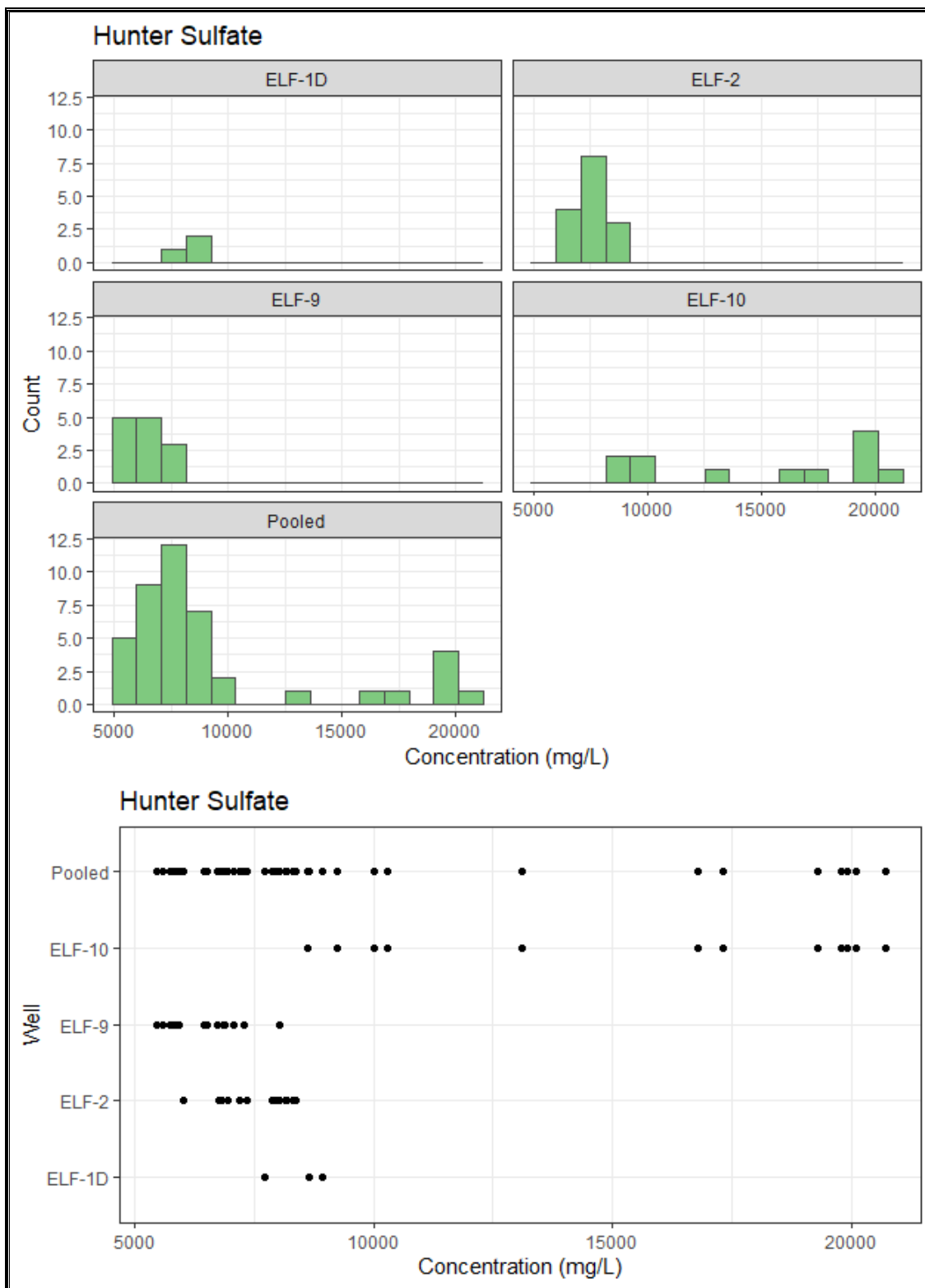


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

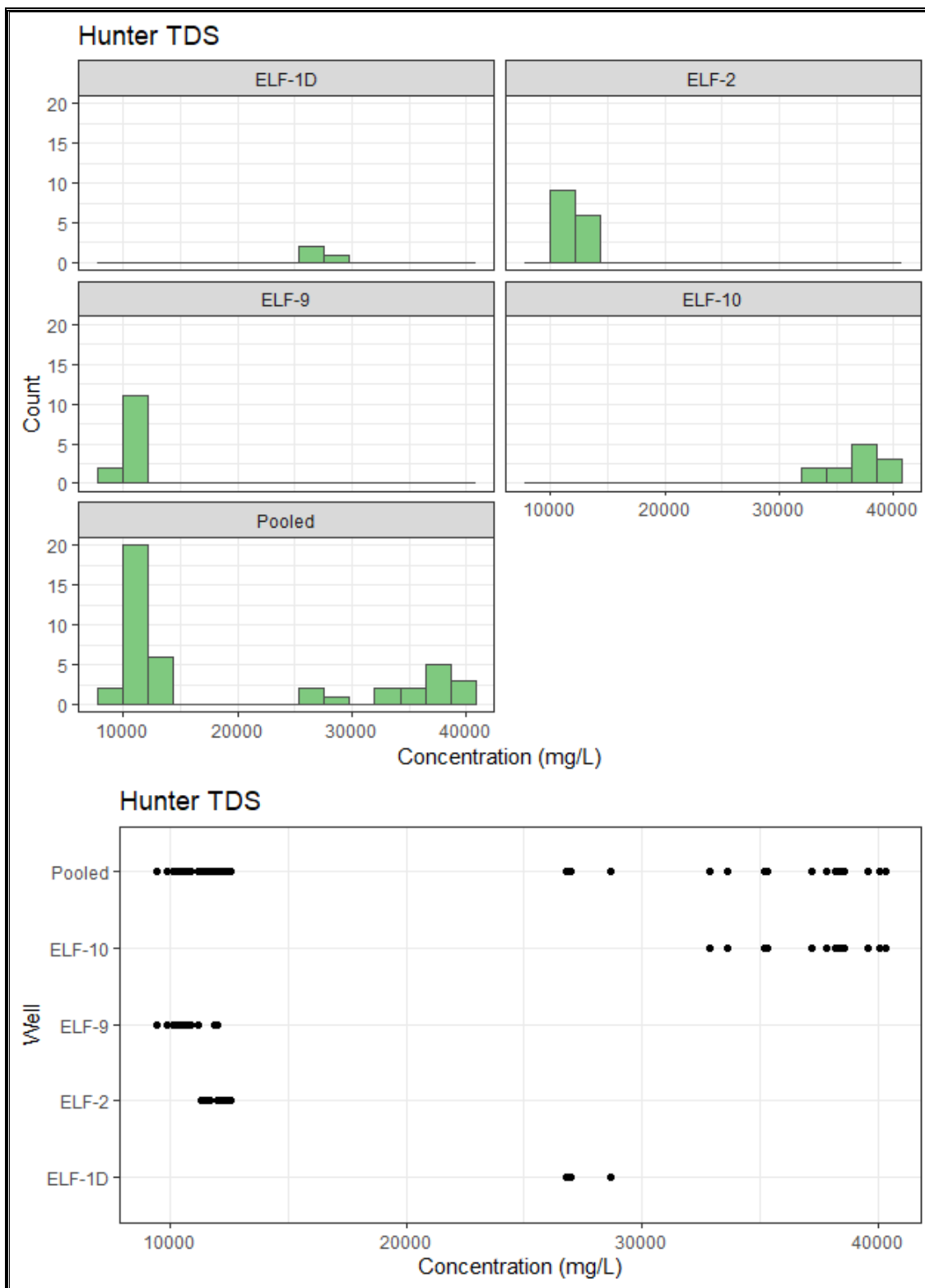


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

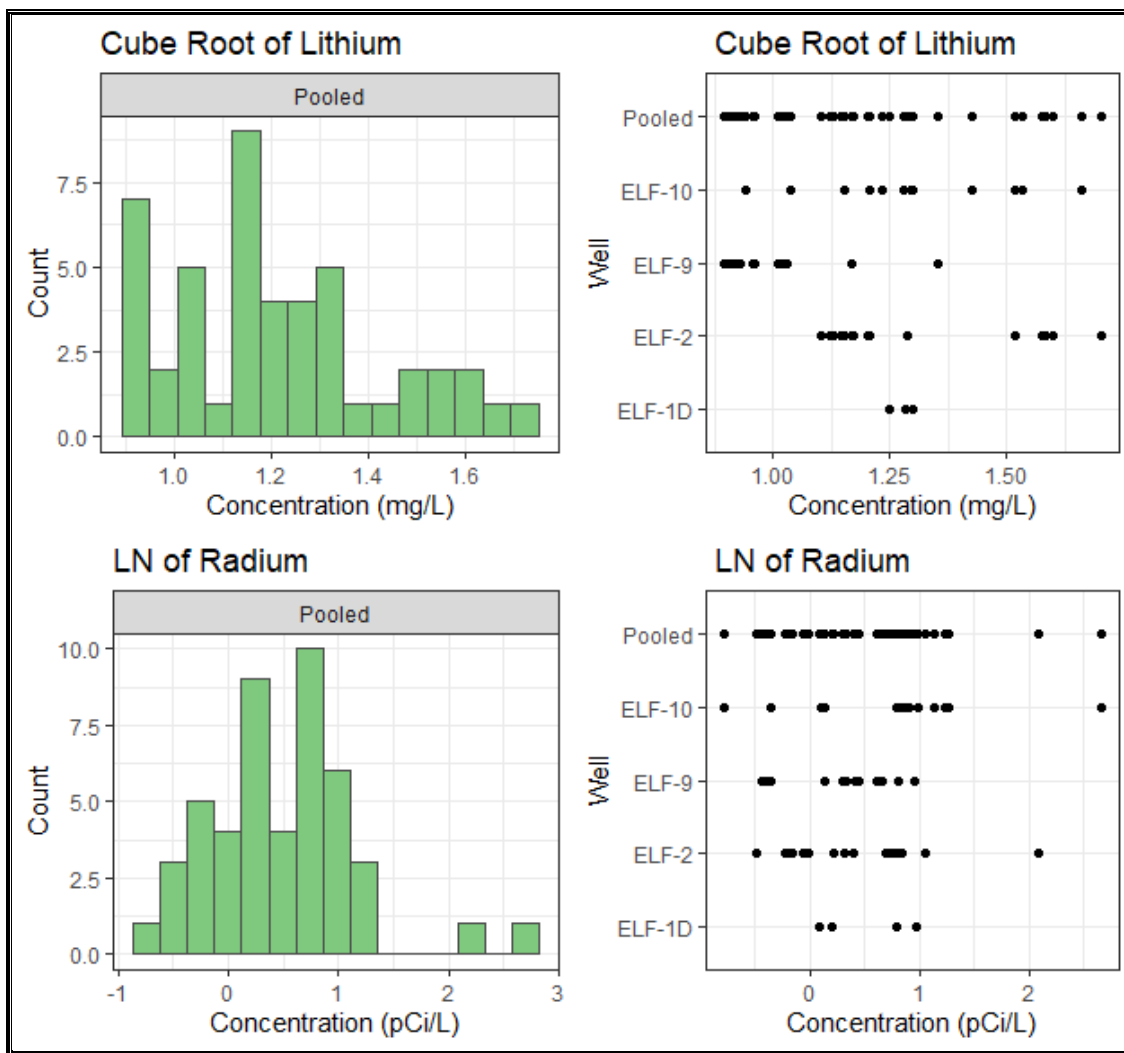


Figure C.3 (cont.). Histograms and dot plots for the upgradient CCR Landfill data.

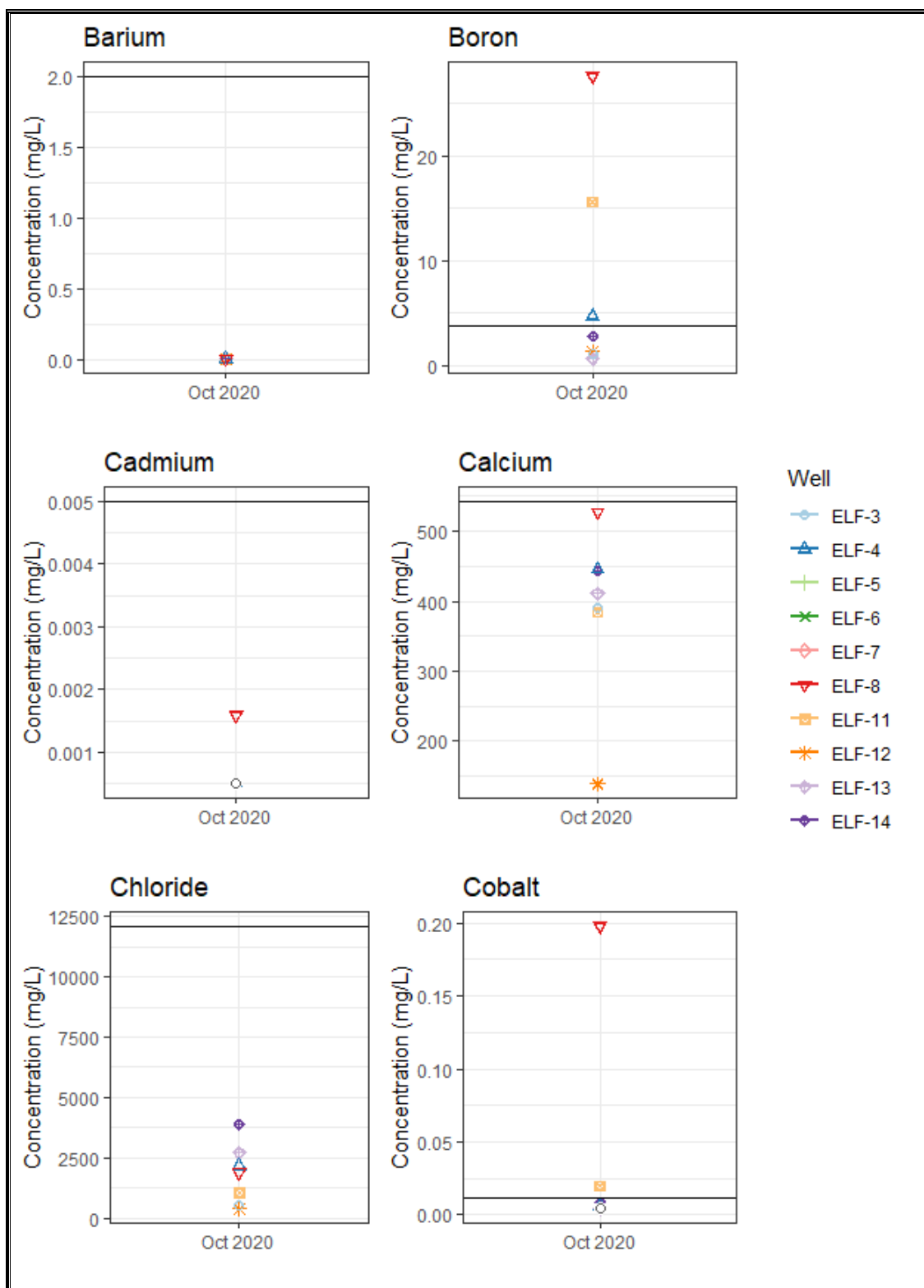


Figure C.4. Groundwater Protection Standard plots for the CCR Landfill.

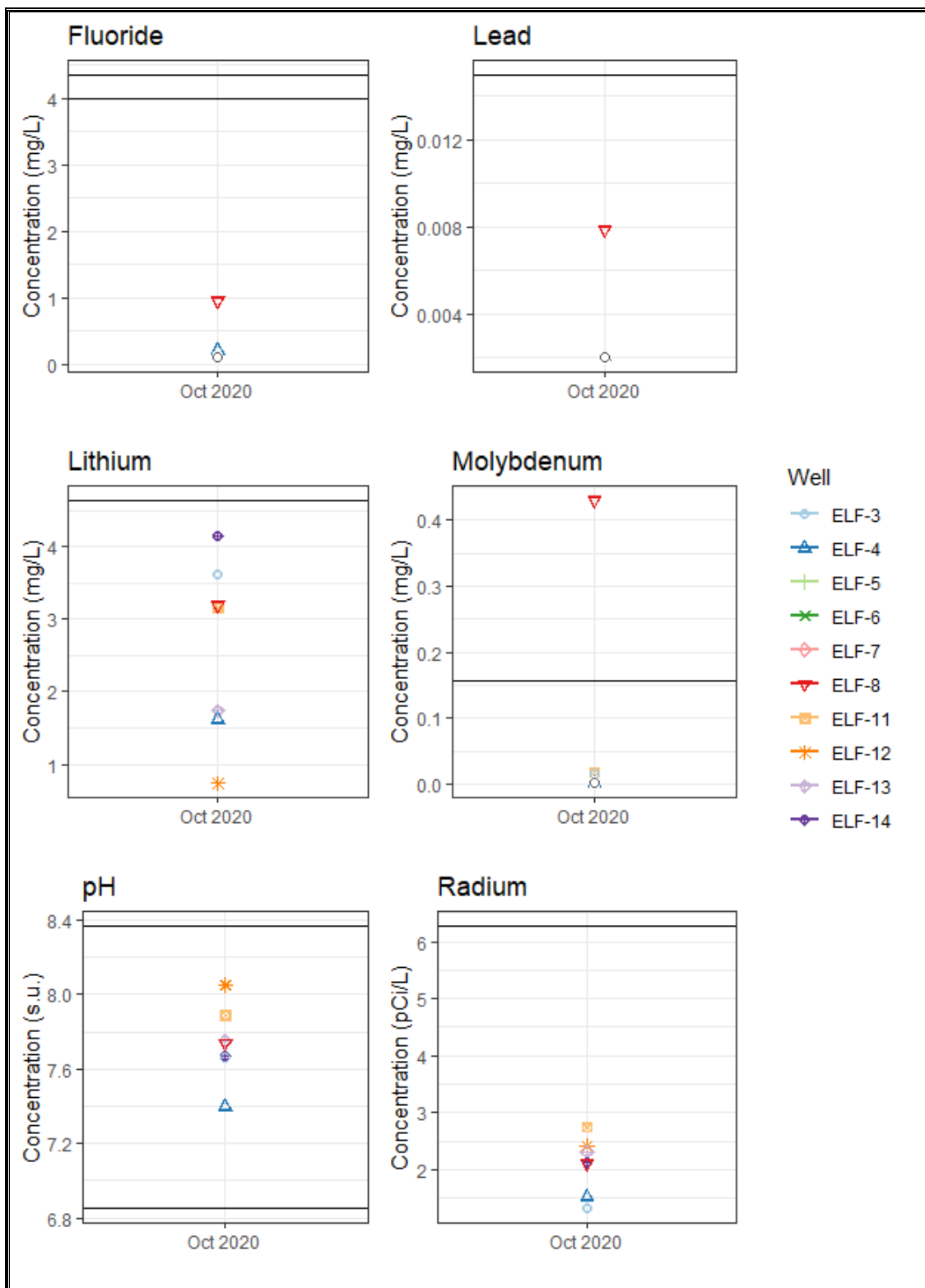


Figure C.4 (cont.). Groundwater Protection Standard plots for the CCR Landfill.

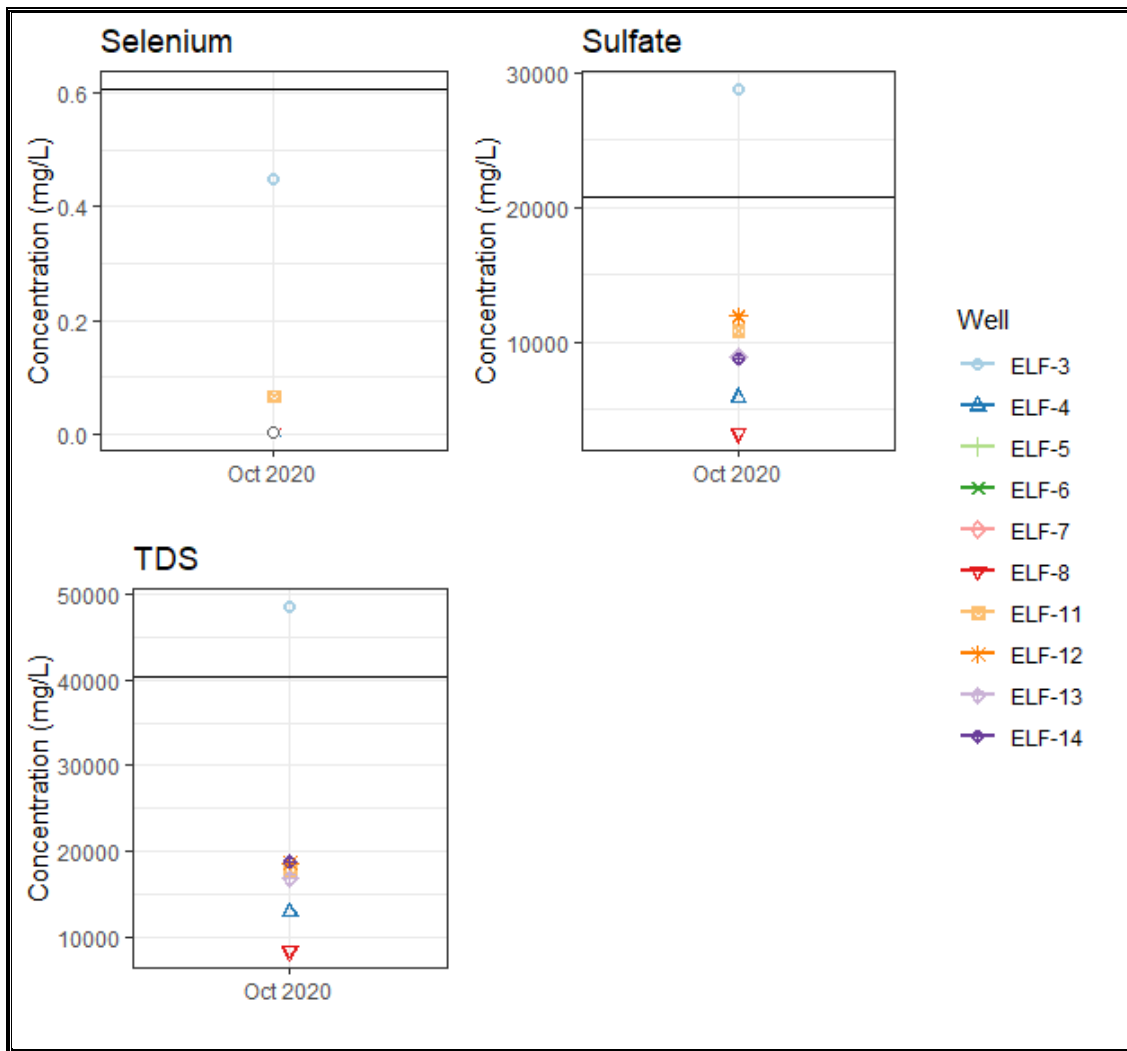


Figure C.4 (cont.). Groundwater Protection Standard plots for the CCR Landfill.

Attachment D:

Field Data Sheets



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|-----------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-1D |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 29, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 01:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 85.48 |
| Field Conditions | Clear and sunny 40°F. Light wind. | | |

FIELD PARAMETERS

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

Water level below top of pump. Hit top of pump with meter at 83.75 feet Pulled the pump, depth to water equals 84.29 feet No Sample



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-10 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 17:50 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 50.42 |
| Field Conditions | sunny and clear, 54°F, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1710 | 14.23 | 46300 | 1.19 | 6.81 | 158 | 14 |
| 1720 | 14.2 | 46300 | 1.16 | 6.8 | 156 | 11.3 |
| 1730 | 14.16 | 46300 | 1.09 | 6.79 | 153 | 10.6 |
| 1740 | 14.12 | 46400 | 1.06 | 6.79 | 151 | 9.7 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Very poor producing well. Very slow to sample. 12 D , 14 V. 68 psi water level during sampling
dropped below top of pump. It took 1.5 hours to collect samples.



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|-----------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-2 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 29, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 10:45 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 24.69 |
| Field Conditions | 42°F, clear and sunny, light wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1010 | 13.39 | 13600 | 1.51 | 7.06 | 193 | 0 |
| 1020 | 13.41 | 13500 | 1.45 | 7.06 | 195 | 0 |
| 1030 | 13.41 | 13500 | 1.39 | 7.06 | 195 | 0 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Good producer, Clearwater. Stabilized quickly. 7D, 7S 40 PSI



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-3 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 17:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 30.89 |
| Field Conditions | Clear and sunny, 55°F, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1615 | 13.48 | 44900 | 2.01 | 7.32 | 74 | 73.5 |
| 1625 | 13.38 | 44800 | 2.09 | 7.32 | 81 | 78.4 |
| 1635 | 13.37 | 44800 | 2.14 | 7.33 | 93 | 77.4 |
| 1645 | 13.42 | 44900 | 2.19 | 7.33 | 97 | 76.9 |
| 1655 | 13.42 | 44900 | 2.23 | 7.33 | 99 | 74.8 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Water level is up on this well which is unusual. Able to collect samples in not too long time



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-4 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 14:52 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 17.70 |
| Field Conditions | sunny and clear, 55°F, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1415 | 14.49 | 14900 | 1.21 | 6.94 | 221 | 0 |
| 1425 | 14.4 | 14800 | 1.14 | 6.94 | 222 | 0 |
| 1435 | 14.38 | 14800 | 1.06 | 6.94 | 222 | 0 |
| 1445 | 14.39 | 14800 | 1.03 | 6.93 | 222 | 0 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Yellow water but clear. Good producer.



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-5 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 14:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 18.75 |
| Field Conditions | Sunny and clear, 55°F, no wind | | |

FIELD PARAMETERS

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

Water level at top of the pump 18.3 feet. Not able to bring water to surface to collect a sample. No sample.



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-6 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 01:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 0 |
| Field Conditions | 55°F, clear and sunny, no wind | | |

FIELD PARAMETERS

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

Water level below top of pump. Measured to top of pump 16.4 feet, no water. Pulled pump. Took water level reading no water! No sample.



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|--------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-7 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 01:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 16.12 |
| Field Conditions | Sunny and clear, 56°F, no wind | | |

FIELD PARAMETERS

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

Water level is below top of pump at 15.60 feet. Pulled pump and DTW was 16.12 feet Able to bring very small amount of water to the surface but not able to continue to pump enough for samples. No samples



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|----------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-8 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 11:40 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 10.52 |
| Field Conditions | 35°F, clear sunny, light breeze. | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1105 | 14.79 | 11300 | 1 | 7.44 | 158 | 12.8 |
| 1115 | 14.89 | 11200 | 0.78 | 7.44 | 157 | 3.1 |
| 1125 | 14.94 | 11200 | 0.75 | 7.44 | 156 | 0 |
| 1135 | 14.97 | 11200 | 0.73 | 7.43 | 154 | 0 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Very good producer, cleared up nicely. 6D, 10 V



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GROUNDWATER SAMPLING FORM

| | | | |
|----------------------------|-------------------------------|-----------------------------|------------------|
| Project Name | Hunter Power Plant | Project Location | Castle Dale UT |
| Job number(s) | PERCM052 | Sample ID | ELF-9 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 29, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 09:48 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 23.14 |
| Field Conditions | 34°F clear and sunny, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 910 | 11.76 | 15900 | 2.7 | 7.8 | 105 | 91 |
| 920 | 11.64 | 14800 | 1.79 | 7.81 | 86 | 3.1 |
| 930 | 11.61 | 14600 | 1.72 | 7.8 | 82 | 0 |
| 940 | 11.59 | 14500 | 1.65 | 7.81 | 78 | 0 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Muddy but cleared up. Water level dropped significantly 11 D, 10V. 70 psi



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) | PERCM052 | Sample ID | ELF-11 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 10:55 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 30.28 |
| Field Conditions | 33°F, clear, light breeze. | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1025 | 13.01 | 19500 | 2.12 | 7.09 | 125 | 119 |
| 1035 | 13.06 | 19400 | 1.71 | 7.1 | 130 | 98 |
| 1045 | 13.12 | 19500 | 1.64 | 7.09 | 131 | 100 |
| 1055 | 13.12 | 19500 | 1.59 | 7.1 | 132 | 104 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Good producer, muddy at first but cleared up. 8 D, 6V



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) | PERCM052 | Sample ID | ELF-12 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 16:00 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 20.48 |
| Field Conditions | 56°F, clear and sunny, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1520 | 13.59 | 21600 | 1.17 | 7.43 | -38 | 127 |
| 1530 | 13.29 | 21600 | 1.09 | 7.43 | -54 | 21.6 |
| 1540 | 13.38 | 21500 | 1.08 | 7.43 | -59 | 11.8 |
| 1550 | 13.28 | 21500 | 1.09 | 7.42 | -61 | 10.6 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Slow, muddy at first but cleared up. 11D, 9V



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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) | PERCM052 | Sample ID | ELF-13 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 13:10 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 4.63 |
| Field Conditions | 50°F, clear and sunny, no wind | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1235 | 13.12 | 20400 | 1.01 | 6.95 | 179 | 0 |
| 1245 | 13.06 | 20400 | 0.91 | 6.94 | 180 | 0 |
| 1255 | 13.08 | 20400 | 0.87 | 6.94 | 180 | 0 |
| 1305 | 13.06 | 20400 | 0.85 | 6.93 | 180 | 0 |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Group B Duplicate sample taken this well. 6D 12 V



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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) | PERCM052 | Sample ID | ELF-14 |
| Sampling Method | Low Flow Bladder Pump | Sample Date | October 28, 2020 |
| Decon Method | Dedicated Equipment | Sample Time | 12:25 |
| Sampler(s) Initials | DV | Depth to Water (ft.) | 6.00 |
| Field Conditions | 38°F, clear and sunny, no wind. | | |

FIELD PARAMETERS

| TIME (min) | WATER TEMP (C) | SC (uS) | DO (mg/l) | pH (s.u.) | ORP (mv) | TURBIDITY (NTU) |
|------------|----------------|---------|-----------|-----------|----------|-----------------|
| 1150 | 14.77 | 23400 | 1.09 | 7.08 | 70 | 391 |
| 1200 | 14.98 | 23200 | 1.14 | 7.08 | 79 | 218 |
| 1210 | 15.01 | 23100 | 1.07 | 7.08 | 81 | 202 |
| 1220 | 15.03 | 23200 | 1.03 | 7.07 | 83 | 198 |
| | | | | | | |
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SAMPLE COLLECTION

| APPENDIX FOR CURRENT SAMPLE | | 3&4 | |
|-----------------------------|------------------|---------------|---------------------------------------|
| 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

Good producer, muddy but clears a lot. 6D, 11 V

Attachment E:

Laboratory Analytical Reports



Radium-226

Case Narrative

American West Analytical Labs

Hunter Power Plant – CCR – 2010965

Work Order Number: 2011028

1. This report consists of the analytical results for 12 water samples received by ALS on 11/03/2020.
2. These samples were prepared and analyzed according to the current revision of SOP 783. The analyses were completed on 11/27/2020.
3. The analysis results for these samples are reported in units of pCi/L. These samples were not filtered prior to analysis.
4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
5. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for all samples and associated QC samples fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. These samples are identified with a "Y1" flag on the final reports.
6. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson

Radiochemistry Primary Data Reviewer

11/28/20

Date

Radiochemistry Final Data Reviewer

11/30/20

Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2011028

Client Name: American West Analytical Labs

Client Project Name: Hunter Power Plant - CCR

Client Project Number: 2010965

Client PO Number: 2010965

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|----------------------|-------------------|------------|--------|----------------|----------------|
| ELF-10 | 2011028-1 | | WATER | 28-Oct-20 | 17:50 |
| ELF-11 | 2011028-2 | | WATER | 28-Oct-20 | 10:55 |
| ELF-12 | 2011028-3 | | WATER | 28-Oct-20 | 16:00 |
| ELF-13 | 2011028-4 | | WATER | 28-Oct-20 | 13:05 |
| ELF-14 | 2011028-5 | | WATER | 28-Oct-20 | 12:25 |
| ELF-2 | 2011028-6 | | WATER | 28-Oct-20 | 10:42 |
| ELF-3 | 2011028-7 | | WATER | 28-Oct-20 | 17:00 |
| ELF-4 | 2011028-8 | | WATER | 28-Oct-20 | 14:52 |
| ELF-8 | 2011028-9 | | WATER | 28-Oct-20 | 11:40 |
| ELF-9 | 2011028-10 | | WATER | 29-Oct-20 | 9:48 |
| Duplicate | 2011028-11 | | WATER | 28-Oct-20 | |
| Field Blank | 2011028-12 | | WATER | 29-Oct-20 | 10:45 |



8201102

AWAL Lab Sample Set #
Page 1 of 2

[illegible]



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client Name/ID:

AWAL

Workorder No:

2011028

Project Manager:

KMO

Initials:

TM

Date:

11/3/20

| | | | |
|--|--|--|---|
| 1. Are airbills / shipping documents present and/or removable? | <input type="checkbox"/> Drop Off | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 2. Are custody seals on shipping containers intact? | <input type="checkbox"/> NONE | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 3. Are custody seals on sample containers intact? | <input checked="" type="checkbox"/> NONE | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 4. Is there a COC (chain-of-custody) present? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 6. Are short-hold samples present? | | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| 7. Are all samples within holding times for the requested analyses? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 8. Were all sample containers received intact? (not broken or leaking) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 9. Is there sufficient sample for the requested analyses? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 11. Are all aqueous samples preserved correctly, if required? | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 12. Were unpreserved samples pH checked, if required? | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| 13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter? | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| 14. Were the samples shipped on ice? | | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| 15. Were cooler temperatures measured at 0.1 - 6.0°C? | IR gun used: <input type="checkbox"/> #3 <input type="checkbox"/> #5 | <input checked="" type="checkbox"/> Red Only | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |

| | | |
|---|-----|-----|
| Cooler #: | 1 | 2 |
| Temperature (°C): | amb | amb |
| # of custody seals on cooler: | 1 | 1 |
| External mR/hr reading: | 11 | 10 |
| Background mR/hr reading: | 10 | |
| Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (if no, see Form 008) | | |
| <input type="checkbox"/> N/A <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | |

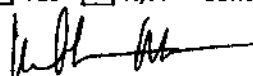
* Please provide details below for 'NO' responses in gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: TM

If applicable, was the client contacted? ☐ YES ☐ N/A Contact Name

Date:

Project Manager Signature / Date:

 11/3/20

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.
2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
3. **GETTING YOUR SHIPMENT TO UPS**
Customers with a scheduled Pickup
 - Your driver will pickup your shipment(s) as usual.

Customers without a scheduled Pickup


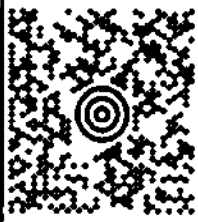


- Schedule a Pickup on [ups.com](https://www.ups.com) to have a UPS driver pickup all of your packages.
- Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at [ups.com](https://www.ups.com).

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SALT LAKE CITY UT 84123-1132

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SALT LAKE CITY UT 84107-2620

FOLD HERE

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|---|--|---|---------------|
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | | 22 LBS
DWT: 15,14,11 | 1 OF 2 |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
ALS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524 | | CO 805 0-01
 | |
|  | | UPS GROUND
TRACKING #: 1Z 9E7 258 03 9162 8968 | |
| | |  | |
| | | BILLING: P/P | |
| | | 
XOL 20.10.23 NV45 34-0A 10/2020* | |

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.
2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. GETTING YOUR SHIPMENT TO UPS

Customers with a scheduled Pickup

- Your driver will pickup your shipment(s) as usual.

Customers without a scheduled Pickup

- Schedule a Pickup on [ups.com](https://www.ups.com) to have a UPS driver pickup all of your packages.
- Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at [ups.com](https://www.ups.com).

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 3954
 4306 S STATE ST
 SALT LAKE CITY UT 84107-2620

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| | | | | |
|--|---|---|--|--|
| <p>ELONA HAYWARD
 801-263-8686
 AMERICAN WEST ANALYTICAL LABS
 3440 S 700 W
 SALT LAKE CITY UT 84119</p> <p>SHIP TO:
 KATIE O'BRIEN
 970-218-4543
 ALS LIFE SCIENCES/ENVIRONMENTAL
 225 COMMERCE DR.
 FORT COLLINS CO 80524</p> <p>46 LBS
 DWT: 24,14,13
 AH</p> <p>2 OF 2</p> <p><i>10-1</i>
 <i>amb</i></p> | <p>CO 805 0-01</p>   | <p>UPS GROUND
 TRACKING #: 1Z 9E7 258 03 9477 3573</p> |  | <p>BILLING: P/P</p> <p>XOL 20.10.23 NV45 34.0A 10/2020*</p>  |
|--|---|---|--|--|

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Lab ID: RE201119-1MB

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 19-Nov-20

Date Prepared: 19-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Final Aliquot: 995 ml

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | -0.03 +/- 0.16 | 0.36 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15490 | 15880 | ug | 103 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2011028-1

Date Printed: Saturday, November 28, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 1 of 1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Lab ID: RE201119-1LCS

Sample Matrix: WATER

Prep Batch: RE201119-1

Final Aliquot: 995 ml

Prep SOP: PAI 783 Rev 15

QCBatchID: RE201119-1-2

Result Units: pCi/l

Date Collected: 19-Nov-20

Run ID: RE201119-1A

File Name: Manual Entry

Date Prepared: 19-Nov-20

Count Time: 15 minutes

Date Analyzed: 27-Nov-20

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 41 +/- 10 | 0 | 46.80 | 87.4 | 67 - 120 | P,Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15490 | 15790 | ug | 102 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2011028-1

Date Printed: Saturday, November 28, 2020

ALS -- Fort Collins

Page 1 of 2

LIMS Version: 7.010

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Lab ID: RE201119-1LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 19-Nov-20

Date Prepared: 19-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Final Aliquot: 995 ml

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 13982-63-3 | Ra-226 | 46 +/- 12 | 0 | 46.80 | 99.3 | 67 - 120 | P,Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15490 | 15880 | ug | 103 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID:
Lab ID: RE201119-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 19-Nov-20
Date Prepared: 19-Nov-20
Date Analyzed: 27-Nov-20

Prep Batch: RE201119-1
QCBatchID: RE201119-1-2
Run ID: RE201119-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|------------|---------|-----|-------|------------|---------|-----|-------|-------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 13982-63-3 | Ra-226 | 41 +/- 10 | | 0 | P,Y1 | 46 +/- 12 | | 0 | P,Y1 | 0.361 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-10
Lab ID: 2011028-1

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.23 +/- 0.27 | 0.42 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15830 | ug | 102 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

| | |
|-----------|-----------|
| Field ID: | ELF-11 |
| Lab ID: | 2011028-2 |

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.14 +/- 0.17 | 0.26 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15510 | 15350 | ug | 98.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-12
Lab ID: 2011028-3

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.09 +/- 0.22 | 0.39 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15940 | ug | 103 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-13

Lab ID: 2011028-4

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.95 +/- 0.50 | 0.51 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15600 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-14
Lab ID: 2011028-5

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.35 +/- 0.36 | 0.55 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15510 | 15610 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-2
Lab ID: 2011028-6

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 1.27 +/- 0.53 | 0.41 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15840 | ug | 102 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-3
Lab ID: 2011028-7

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.21 +/- 0.23 | 0.33 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15840 | ug | 102 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-4
Lab ID: 2011028-8

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.27 +/- 0.22 | 0.29 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15620 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-8
Lab ID: 2011028-9

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.82 +/- 0.37 | 0.21 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15710 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-9

Lab ID: 2011028-10

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 29-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.31 +/- 0.23 | 0.26 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15640 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

| | |
|-----------|------------|
| Field ID: | Duplicate |
| Lab ID: | 2011028-11 |

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 28-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | 0.62 +/- 0.34 | 0.36 | 1 | NA | Y1 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15560 | ug | 100 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Field ID: Field Blank

Lab ID: 2011028-12

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 29-Oct-20

Date Prepared: 19-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RE201119-1

QCBatchID: RE201119-1-2

Run ID: RE201119-1A

Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 13982-63-3 | Ra-226 | -0.03 +/- 0.15 | 0.29 | 1 | NA | Y1,U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 15500 | 15730 | ug | 101 | 40 - 110 % | Y1 |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2011028-1



Radium-228

Case Narrative

American West Analytical Labs

Hunter Power Plant – CCR – 2010965

Work Order Number: 2011028

1. This report consists of the analytical results for 12 water samples received by ALS on 11/03/2020.
2. These samples were prepared according to the current revision of SOP 749.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to the current revision of SOP 724. The analyses were completed on 11/20/2020.
4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
6. The requested MDC was not met for samples 2011028-3 and -5. These samples are identified with an "M3" qualifier on the final reports. The reported activity for these samples exceeds the achieved MDC.
7. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson

Jean Anderson

Radiochemistry Primary Data Reviewer

11/28/20

Date

Kath M. A.

Radiochemistry Final Data Reviewer

11/30/20

Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2011028

Client Name: American West Analytical Labs

Client Project Name: Hunter Power Plant - CCR

Client Project Number: 2010965

Client PO Number: 2010965

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|----------------------|-------------------|------------|--------|----------------|----------------|
| ELF-10 | 2011028-1 | | WATER | 28-Oct-20 | 17:50 |
| ELF-11 | 2011028-2 | | WATER | 28-Oct-20 | 10:55 |
| ELF-12 | 2011028-3 | | WATER | 28-Oct-20 | 16:00 |
| ELF-13 | 2011028-4 | | WATER | 28-Oct-20 | 13:05 |
| ELF-14 | 2011028-5 | | WATER | 28-Oct-20 | 12:25 |
| ELF-2 | 2011028-6 | | WATER | 28-Oct-20 | 10:42 |
| ELF-3 | 2011028-7 | | WATER | 28-Oct-20 | 17:00 |
| ELF-4 | 2011028-8 | | WATER | 28-Oct-20 | 14:52 |
| ELF-8 | 2011028-9 | | WATER | 28-Oct-20 | 11:40 |
| ELF-9 | 2011028-10 | | WATER | 29-Oct-20 | 9:48 |
| Duplicate | 2011028-11 | | WATER | 28-Oct-20 | |
| Field Blank | 2011028-12 | | WATER | 29-Oct-20 | 10:45 |

**American West
Analytical Laboratories**

3440 S. 700 W. Salt Lake City, UT 84119

Phone # (801) 263-8686 Toll Free # (888) 263-8686

Fax # (801) 263-8687 Email awalerawal-labs.com

www.awal-labs.com

CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

2011028

AWAL Lab Sample Set #

Page 1 of 2

Client: **American West Analytical Laboratories**

Address: **3440 S. 700 W.**

City, State, Zip: **Salt Lake City , UT 84119**

Contact: **Elona Hayward**

Phone #: **(801) 263-8686** Cell #: _____

E-mail: **elona@awal-labs.com; denise@awal-labs.com; jose@awal-labs.com**

Project Name: **Hunter Power Plant - CCR**

Project #: _____

PC #: **2010965**

Sampler Name: _____

| Sample ID: | | Date Sampled | Time Sampled | # of Cont. | Sample M | Radium | | | | | | | | | | | Known Hazards & Sample Comments |
|------------|-------------|--------------|--------------|------------|----------|--------|--|--|--|--|--|--|--|--|--|--|--|
| 1 | ELF-10 | 10/28/2020 | 17:50 | 2 | W | X | | | | | | | | | | | 2 Ambient or Chilled |
| 2 | ELF-11 | 10/28/2020 | 10:55 | 2 | W | X | | | | | | | | | | | 3 Temperature _____ °C |
| 3 | ELF-12 | 10/28/2020 | 16:00 | 2 | W | X | | | | | | | | | | | 4 Received Intact
Y N |
| 4 | ELF-13 | 10/28/2020 | 13:05 | 2 | W | X | | | | | | | | | | | 5 Properly Preserved
Y N Checked at bench |
| 5 | ELF-14 | 10/28/2020 | 12:25 | 2 | W | X | | | | | | | | | | | |
| 6 | ELF-2 | 10/28/2020 | 10:42 | 2 | W | X | | | | | | | | | | | |
| 7 | ELF-3 | 10/28/2020 | 17:00 | 2 | W | X | | | | | | | | | | | |
| 8 | ELF-4 | 10/28/2020 | 14:52 | 2 | W | X | | | | | | | | | | | 6 Received Within
Holding Times
Y N |
| 9 | ELF-8 | 10/28/2020 | 11:40 | 2 | W | X | | | | | | | | | | | |
| 10 | ELF-9 | 10/29/2020 | 9:48 | 2 | W | X | | | | | | | | | | | |
| 11 | Duplicate | 10/28/2020 | | 2 | W | X | | | | | | | | | | | |
| 12 | Field Blank | 10/29/2020 | 10:45 | 2 | W | X | | | | | | | | | | | Sample Labels and COC Record Match?
Y N |
| 13 | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | |

| | | | | |
|---|----------------|--|---------------|--|
| Relinquished by:
Signature: <i>Elmer Hayward</i> | Date: 10/30/20 | Received by:
Signature: <i>Tyler Messer</i> | Date: 11/3/20 | Special Instructions:
QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS,
MS/MSD performed on customer sample

Samples sent to ALS - Ft. Collins. |
| Print Name: Elmer Hayward | Time: 7:00 | Print Name: Tyler Messer | Time: 12:10 | |
| Relinquished by:
Signature: | Date: | Received by:
Signature: | Date: | |
| Print Name: | Time: | Print Name: | Time: | |
| Relinquished by:
Signature: | Date: | Received by:
Signature: | Date: | |
| Print Name: | Time: | Print Name: | Time: | |



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client Name/ID:

AWAL

Workorder No:

2011028

Project Manager:

KMO

Initials:

TM

Date:

11/3/20

| | | | |
|--|--|--|---|
| 1. Are airbills / shipping documents present and/or removable? | <input type="checkbox"/> Drop Off | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 2. Are custody seals on shipping containers intact? | <input type="checkbox"/> NONE | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 3. Are custody seals on sample containers intact? | <input checked="" type="checkbox"/> NONE | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 4. Is there a COC (chain-of-custody) present? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 6. Are short-hold samples present? | | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| 7. Are all samples within holding times for the requested analyses? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 8. Were all sample containers received intact? (not broken or leaking) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 9. Is there sufficient sample for the requested analyses? | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines) | | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 11. Are all aqueous samples preserved correctly, if required? | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO* |
| 12. Were unpreserved samples pH checked, if required? | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| 13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter? | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| 14. Were the samples shipped on ice? | | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| 15. Were cooler temperatures measured at 0.1 - 6.0°C? | IR gun used: <input type="checkbox"/> #3 <input type="checkbox"/> #5 | <input checked="" type="checkbox"/> Red Only | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |

| | | |
|---|-----|-----|
| Cooler #: | 1 | 2 |
| Temperature (°C): | amb | amb |
| # of custody seals on cooler: | 1 | 1 |
| External mR/hr reading: | 11 | 10 |
| Background mR/hr reading: | 10 | |
| Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (if no, see Form 008) | | |
| <input type="checkbox"/> N/A <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | |

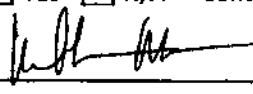
* Please provide details below for 'NO' responses in gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: TM

If applicable, was the client contacted? ☐ YES ☐ N/A Contact Name

Date:

Project Manager Signature / Date:

 11/3/20

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.
2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
3. **GETTING YOUR SHIPMENT TO UPS**
Customers with a scheduled Pickup
 - Your driver will pickup your shipment(s) as usual.

Customers without a scheduled Pickup





- Schedule a Pickup on [ups.com](https://www.ups.com) to have a UPS driver pickup all of your packages.
- Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at [ups.com](https://www.ups.com).

UPS Access Point™
 ADVANCE AUTO PARTS STORE
 4719
 1931 W 3500 S
 WEST VALLEY CITY UT 84119-3437

UPS Access Point™
 CVS STORE # 10741
 4082 S REDWOOD RD
 SALT LAKE CITY UT 84123-1132

UPS Access Point™
 ADVANCE AUTO PARTS STORE
 3954
 4306 S STATE ST
 SALT LAKE CITY UT 84107-2620

FOLD HERE

| | | | | |
|---|---|---|--|--|
| <p>ELONA HAYWARD
 801-263-8686
 AMERICAN WEST ANALYTICAL LABS
 3440 S 700 W
 SALT LAKE CITY UT 84119</p> <p>SHIP TO:
 KATIE O'BRIEN
 970-218-4543
 ALS LIFE SCIENCES/ENVIRONMENTAL
 225 COMMERCE DR.
 FORT COLLINS CO 80524</p> <p>22 LBS
 DWT: 15,14,11</p> <p>1 OF 2</p> | <p>CO 805 0-01</p>   | <p>UPS GROUND
 TRACKING #: 1Z 9E7 258 03 9162 8968</p> |  | <p>BILLING: P/P</p>  <p>XOL 20.10.23 NV45 34-0A 10/2020*</p> |
|---|---|---|--|--|

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.
2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS****Customers with a scheduled Pickup**

- Your driver will pickup your shipment(s) as usual.

Customers without a scheduled Pickup

- Schedule a Pickup on [ups.com](https://www.ups.com) to have a UPS driver pickup all of your packages.
- Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at [ups.com](https://www.ups.com).

UPS Access Point™
ADVANCE AUTO PARTS STORE
4719
1931 W 3500 S
WEST VALLEY CITY UT 84119-3437

UPS Access Point™
CVS STORE # 10741
4082 S REDWOOD RD
SALT LAKE CITY UT 84123-1132

UPS Access Point™
ADVANCE AUTO PARTS STORE
3954
4306 S STATE ST
SALT LAKE CITY UT 84107-2620

FOLD HERE

| | | | |
|--|--|--|--|
| 46 LBS
DWT: 24,14,13
AH | | 2 OF 2 | |
| SHIP TO:
KATIE O'BRIEN
970-218-4543
ALS LIFE SCIENCES/ENVIRONMENTAL
225 COMMERCE DR.
FORT COLLINS CO 80524 | | CO 805 0-01
 | |
|  | | UPS GROUND
TRACKING #: 1Z 9E7 258 03 9477 3573
 | |
| ELONA HAYWARD
801-263-8686
AMERICAN WEST ANALYTICAL LABS
3440 S 700 W
SALT LAKE CITY UT 84119 | | BILLING: P/P
 | |
| | | XOL 20.10.23 NV45 34.0A 10/2020* | |

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Lab ID: RA201113-2MB

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-Nov-20

Date Prepared: 13-Nov-20

Date Analyzed: 20-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|----------------|--------------------|------|---------------|----|---------------|
| 15262-20-1 | Ra-228 | 0.71 +/- 0.40 | 0.73 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33080 | 32260 | ug | 97.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2011028-1

Date Printed: Saturday, November 28, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Lab ID: RA201113-2LCS

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-Nov-20

Date Prepared: 13-Nov-20

Date Analyzed: 20-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 24.5 +/- 5.7 | 0.8 | 23.29 | 105 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33080 | 30920 | ug | 93.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2011028-1

Date Printed: Saturday, November 28, 2020

ALS -- Fort Collins

LIMS Version: 7.010

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Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

Client/Project ID: Hunter Power Plant - CCR 2010965

Lab ID: RA201113-2LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-Nov-20

Date Prepared: 13-Nov-20

Date Analyzed: 20-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Final Aliquot: 997 ml

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Results +/- 2s TPU | MDC | Spike Added | % Rec | Control Limits | Lab Qualifier |
|------------|----------------|--------------------|-----|-------------|-------|----------------|---------------|
| 15262-20-1 | Ra-228 | 20.8 +/- 4.9 | 0.7 | 23.29 | 89.3 | 70 - 130 | P |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33080 | 32010 | ug | 96.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2011028-1

Date Printed: Saturday, November 28, 2020

ALS -- Fort Collins

LIMS Version: 7.010

Page 2 of 2

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID:
Lab ID: RA201113-2LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 13-Nov-20

Date Prepared: 13-Nov-20

Date Analyzed: 20-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC1120

| CASNO | Analyte | Sample | | | | Duplicate | | | | DER | DER Lim |
|------------|---------|--------------|---------|-----|-------|--------------|---------|-----|-------|-------|---------|
| | | Result +/- | 2 s TPU | MDC | Flags | Result +/- | 2 s TPU | MDC | Flags | | |
| 15262-20-1 | Ra-228 | 24.5 +/- 5.7 | | 0.8 | P | 20.8 +/- 4.9 | | 0.7 | P | 0.501 | 2.13 |

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-10
Lab ID: 2011028-1

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.1 | 0.71 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.10 +/- 0.45 | 0.71 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31120 | ug | 94.0 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-11
Lab ID: 2011028-2

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.75 | 1.26 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.75 +/- 0.95 | 1.26 | 1 | NA | M3 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33130 | 18320 | ug | 55.3 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-12
Lab ID: 2011028-3

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.42 | 0.68 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.42 +/- 0.70 | 0.68 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31270 | ug | 94.5 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-13
Lab ID: 2011028-4

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.32 | 0.69 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.37 +/- 0.50 | 0.69 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31390 | ug | 94.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-14

Lab ID: 2011028-5

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 28-Oct-20

Date Prepared: 13-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.12 | 1.01 | 1 | NA | |
| 15262-20-1 | Ra-228 | 2.12 +/- 0.74 | 1.01 | 1 | NA | M3 |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 23400 | ug | 70.7 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-2
Lab ID: 2011028-6

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.08 | 0.76 | 1 | NA | |
| 15262-20-1 | Ra-228 | 0.81 +/- 0.43 | 0.76 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31040 | ug | 93.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-3
Lab ID: 2011028-7

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.32 | 0.72 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.32 +/- 0.50 | 0.72 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31390 | ug | 94.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-4
Lab ID: 2011028-8

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.53 | 0.75 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.53 +/- 0.54 | 0.75 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 30510 | ug | 92.2 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-8
Lab ID: 2011028-9

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7
Date Collected: 28-Oct-20
Date Prepared: 13-Nov-20
Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2
QCBatchID: RA201113-2-1
Run ID: RA201113-2A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 2.11 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.29 +/- 0.49 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31040 | ug | 93.8 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: ELF-9

Lab ID: 2011028-10

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 29-Oct-20

Date Prepared: 13-Nov-20

Date Analyzed: 26-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.36 | 0.73 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.05 +/- 0.45 | 0.73 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31510 | ug | 95.2 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: Duplicate

Lab ID: 2011028-11

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 28-Oct-20

Date Prepared: 13-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 1.72 | 0.74 | 1 | NA | |
| 15262-20-1 | Ra-228 | 1.10 +/- 0.46 | 0.74 | 1 | NA | |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33090 | 31390 | ug | 94.9 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2011028

Client Name: American West Analytical Labs

ClientProject ID: Hunter Power Plant - CCR 2010965

Field ID: Field Blank

Lab ID: 2011028-12

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 29-Oct-20

Date Prepared: 13-Nov-20

Date Analyzed: 27-Nov-20

Prep Batch: RA201113-2

QCBatchID: RA201113-2-1

Run ID: RA201113-2A

Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: RAC1120

| CASNO | Target Nuclide | Result +/- 2 s TPU | MDC | Requested MDC | DL | Lab Qualifier |
|------------|-----------------------|--------------------|------|---------------|----|---------------|
| | COMBINED RA (226+228) | 0 | 0.78 | 1 | NA | U |
| 15262-20-1 | Ra-228 | 0.16 +/- 0.36 | 0.78 | 1 | NA | U |

Chemical Yield Summary

| Carrier/Tracer | Amount Added | Result | Units | Yield | Control Limits | Flag |
|----------------|--------------|--------|-------|-------|----------------|------|
| BARIUM | 33080 | 32440 | ug | 98.1 | 40 - 110 % | |

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2011028-1



Jeff Tucker
PacifiCorp
1407 West North Temple, # 280
Salt Lake City, UT 84116
TEL: (801) 220-2989

RE: Hunter Power Plant - CCR / Group B

Dear Jeff Tucker:

Lab Set ID: 2010965

3440 South 700 West
Salt Lake City, UT 84119

Phone: (801) 263-8686
Toll Free: (888) 263-8686
Fax: (801) 263-8687
e-mail: awal@awal-labs.com
web: www.awal-labs.com

American West Analytical Laboratories received sample(s) on 10/29/2020 for the analyses presented in the following report.

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Thank You,

Approved by:

Digitally signed
by Jose G.
Rocha
Date: 2020.11.17
14:12:29 -07'00'

Laboratory Director or designee

Sample(s) were subcontracted for the following analyses:

Radiological Testing



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-001
Client Sample ID: ELF-10
Collection Date: 10/28/2020 1750h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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Toll Free: (888) 263-8686
Fax: (801) 263-8687
e-mail: awal@awal-labs.com
web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|--------------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | 0.0155 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1035h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1322h | E200.7 | 0.500 | 1.54 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1319h | E200.7 | 10.0 | 407 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | 0.00221 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00400 | 0.00421 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1322h | E200.7 | 0.100 | 2.18 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 927h | E245.1 | 0.0000900 | < 0.0000900 | ¹ |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | 0.0341 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1731h | E200.8 | 0.00200 | < 0.00200 | |

¹ - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-002
Client Sample ID: ELF-11
Collection Date: 10/28/2020 1055h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

3440 South 700 West
Salt Lake City, UT 84119

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 Toll Free: (888) 263-8686
 Fax: (801) 263-8687
 e-mail: awal@awal-labs.com
 web: www.awal-labs.com

Kyle F. Gross
 Laboratory Director

Jose Rocha
 QA Officer

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|--------------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | 0.0108 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1039h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1324h | E200.7 | 0.500 | 15.6 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1439h | E200.7 | 10.0 | 384 | ² |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00400 | 0.0197 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1324h | E200.7 | 0.100 | 3.15 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 939h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | 0.0183 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | 0.0669 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1735h | E200.8 | 0.00200 | < 0.00200 | |

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-003
Client Sample ID: ELF-12
Collection Date: 10/28/2020 1600h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | 0.0101 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1049h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1333h | E200.7 | 0.500 | 1.31 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1322h | E200.7 | 5.00 | 139 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00400 | < 0.00400 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1333h | E200.7 | 0.100 | 0.738 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 941h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | < 0.00200 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1049h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1814h | E200.8 | 0.00200 | < 0.00200 | |

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e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross

Laboratory Director

Jose Rocha

QA Officer



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-004
Client Sample ID: ELF-13
Collection Date: 10/28/2020 1305h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | 0.0100 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1053h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1335h | E200.7 | 0.500 | 0.609 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1325h | E200.7 | 10.0 | 411 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00400 | 0.00421 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1335h | E200.7 | 0.100 | 1.74 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 943h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | < 0.00200 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1053h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1818h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-005
Client Sample ID: ELF-14
Collection Date: 10/28/2020 1225h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | 0.0129 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1057h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1338h | E200.7 | 0.500 | 2.79 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1328h | E200.7 | 10.0 | 443 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00400 | 0.00841 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1338h | E200.7 | 0.100 | 4.15 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 949h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | 0.00399 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1057h | E200.8 | 0.00200 | 0.00573 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1822h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-006
Client Sample ID: ELF-2
Collection Date: 10/28/2020 1042h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

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| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | 0.00965 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1100h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1341h | E200.7 | 0.500 | 3.18 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1447h | E200.7 | 10.0 | 356 | 2 |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00400 | 0.00438 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1341h | E200.7 | 0.100 | 1.42 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 951h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | < 0.00200 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1100h | E200.8 | 0.00200 | 0.00423 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1826h | E200.8 | 0.00200 | < 0.00200 | |

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-007
Client Sample ID: ELF-3
Collection Date: 10/28/2020 1700h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | 0.0107 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1133h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1356h | E200.7 | 0.500 | 1.05 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1357h | E200.7 | 10.0 | 390 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00400 | < 0.00400 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1356h | E200.7 | 0.100 | 3.61 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 953h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | 0.0157 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1133h | E200.8 | 0.00200 | 0.450 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1849h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-008
Client Sample ID: ELF-4
Collection Date: 10/28/2020 1452h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | 0.0111 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1137h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1359h | E200.7 | 0.500 | 4.74 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1400h | E200.7 | 10.0 | 446 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00400 | 0.00638 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1359h | E200.7 | 0.100 | 1.62 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 955h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | 0.00261 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1137h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1853h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-009
Client Sample ID: ELF-8
Collection Date: 10/28/2020 1140h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | 0.0115 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1141h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/6/2020 1403h | E200.7 | 10.0 | 27.6 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.000500 | 0.00159 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1403h | E200.7 | 20.0 | 527 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00400 | 0.198 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | 0.00786 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1402h | E200.7 | 0.100 | 3.20 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 957h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | 0.430 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1141h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1857h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-010
Client Sample ID: ELF-9
Collection Date: 10/29/2020 948h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | 0.00678 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | 0.0126 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1145h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/6/2020 1607h | E200.7 | 0.500 | 1.27 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1607h | E200.7 | 1.00 | 48.9 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00400 | < 0.00400 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/6/2020 1607h | E200.7 | 0.100 | 0.873 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 959h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | 0.0657 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1145h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1901h | E200.8 | 0.00200 | < 0.00200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-011
Client Sample ID: Duplicate
Collection Date: 10/28/2020
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

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| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | 0.0102 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1148h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/9/2020 1405h | E200.7 | 0.500 | 0.719 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1409h | E200.7 | 20.0 | 423 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00400 | 0.00428 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/9/2020 1405h | E200.7 | 0.100 | 1.84 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 1001h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | < 0.00200 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1148h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1905h | E200.8 | 0.00200 | < 0.00200 | |



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-012
Client Sample ID: Field Blank
Collection Date: 10/29/2020 1045h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

TOTAL METALS

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| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------|-------|-----------------|------------------|-------------|-----------------|-------------------|------|
| Antimony | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00400 | < 0.00400 | |
| Arsenic | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |
| Barium | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |
| Beryllium | mg/L | 11/5/2020 1007h | 11/12/2020 1152h | E200.8 | 0.00200 | < 0.00200 | |
| Boron | mg/L | 11/5/2020 1007h | 11/6/2020 1412h | E200.7 | 0.500 | < 0.500 | |
| Cadmium | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.000500 | < 0.000500 | |
| Calcium | mg/L | 11/5/2020 1007h | 11/6/2020 1412h | E200.7 | 1.00 | < 1.00 | |
| Chromium | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |
| Cobalt | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00400 | < 0.00400 | |
| Lead | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |
| Lithium | mg/L | 11/5/2020 1007h | 11/6/2020 1412h | E200.7 | 0.100 | < 0.100 | |
| Mercury | mg/L | 11/9/2020 1206h | 11/10/2020 1003h | E245.1 | 0.0000900 | < 0.0000900 | |
| Molybdenum | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |
| Selenium | mg/L | 11/5/2020 1007h | 11/12/2020 1152h | E200.8 | 0.00200 | < 0.00200 | |
| Thallium | mg/L | 11/5/2020 1007h | 11/9/2020 1909h | E200.8 | 0.00200 | < 0.00200 | |



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-001
Client Sample ID: ELF-10
Collection Date: 10/28/2020 1750h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1059h | E300.0 | 200 | 12,100 | |
| Fluoride | mg/L | | 11/13/2020 1233h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.79 | H |
| Sulfate | mg/L | | 11/10/2020 1059h | E300.0 | 1,500 | 8,610 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 32,900 | |

H - Sample was received outside of the holding time.

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Jose Rocha
QA Officer



INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-002
Client Sample ID: ELF-11
Collection Date: 10/28/2020 1055h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1116h | E300.0 | 100 | 1,040 | |
| Fluoride | mg/L | | 11/13/2020 1250h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.89 | H |
| Sulfate | mg/L | | 11/10/2020 1116h | E300.0 | 750 | 10,800 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 17,800 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-003
Client Sample ID: ELF-12
Collection Date: 10/28/2020 1600h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1133h | E300.0 | 100 | 392 | |
| Fluoride | mg/L | | 11/13/2020 1307h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 8.05 | H |
| Sulfate | mg/L | | 11/10/2020 1133h | E300.0 | 750 | 11,900 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 18,600 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-004
Client Sample ID: ELF-13
Collection Date: 10/28/2020 1305h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1150h | E300.0 | 100 | 2,720 | |
| Fluoride | mg/L | | 11/13/2020 1324h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.75 | H |
| Sulfate | mg/L | | 11/10/2020 1150h | E300.0 | 750 | 8,870 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 16,800 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-005
Client Sample ID: ELF-14
Collection Date: 10/28/2020 1225h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1208h | E300.0 | 100 | 3,880 | |
| Fluoride | mg/L | | 11/13/2020 1341h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.67 | H |
| Sulfate | mg/L | | 11/10/2020 1208h | E300.0 | 750 | 8,730 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 18,800 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-006
Client Sample ID: ELF-2
Collection Date: 10/28/2020 1042h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1225h | E300.0 | 100 | 199 | |
| Fluoride | mg/L | | 11/13/2020 1358h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.51 | H |
| Sulfate | mg/L | | 11/10/2020 1225h | E300.0 | 750 | 7,900 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 12,200 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-007
Client Sample ID: ELF-3
Collection Date: 10/28/2020 1700h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1242h | E300.0 | 500 | 545 | |
| Fluoride | mg/L | | 11/13/2020 1416h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.66 | H |
| Sulfate | mg/L | | 11/10/2020 1242h | E300.0 | 3,750 | 28,800 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 48,600 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-008
Client Sample ID: ELF-4
Collection Date: 10/28/2020 1452h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1334h | E300.0 | 100 | 2,170 | |
| Fluoride | mg/L | | 11/13/2020 1433h | E300.0 | 0.200 | 0.212 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.40 | H |
| Sulfate | mg/L | | 11/10/2020 1334h | E300.0 | 750 | 5,860 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 12,900 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-009
Client Sample ID: ELF-8
Collection Date: 10/28/2020 1140h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1425h | E300.0 | 100 | 1,910 | |
| Fluoride | mg/L | | 11/13/2020 1450h | E300.0 | 0.200 | 0.957 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.74 | H |
| Sulfate | mg/L | | 11/10/2020 1425h | E300.0 | 750 | 3,220 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 8,380 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-010
Client Sample ID: ELF-9
Collection Date: 10/29/2020 948h
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1442h | E300.0 | 100 | 442 | |
| Fluoride | mg/L | | 11/13/2020 1507h | E300.0 | 0.200 | 0.708 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 8.05 | |
| Sulfate | mg/L | | 11/10/2020 1442h | E300.0 | 750 | 6,530 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 10,900 | |

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp **Contact:** Jeff Tucker
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-011
Client Sample ID: Duplicate
Collection Date: 10/28/2020
Received Date: 10/29/2020 1519h

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1459h | E300.0 | 100 | 2,690 | |
| Fluoride | mg/L | | 11/13/2020 1559h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 7.47 | H |
| Sulfate | mg/L | | 11/10/2020 1459h | E300.0 | 750 | 8,600 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 100 | 17,300 | |

H - Sample was received outside of the holding time.

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INORGANIC ANALYTICAL REPORT

Client: PacifiCorp
Project: Hunter Power Plant - CCR / Group B
Lab Sample ID: 2010965-012
Client Sample ID: Field Blank
Collection Date: 10/29/2020 1045h
Received Date: 10/29/2020 1519h

Contact: Jeff Tucker

Analytical Results

| Compound | Units | Date Prepared | Date Analyzed | Method Used | Reporting Limit | Analytical Result | Qual |
|------------------------|----------|---------------|------------------|-------------|-----------------|-------------------|------|
| Chloride | mg/L | | 11/10/2020 1517h | E300.0 | 0.100 | < 0.100 | |
| Fluoride | mg/L | | 11/10/2020 1517h | E300.0 | 0.100 | < 0.100 | |
| pH @ 25° C | pH Units | | 10/29/2020 1745h | SM4500-H+B | 1.00 | 8.16 | |
| Sulfate | mg/L | | 11/10/2020 1517h | E300.0 | 0.750 | < 0.750 | |
| Total Dissolved Solids | mg/L | | 11/2/2020 1420h | SM2540C | 10.0 | 40.0 | |

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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: LCS

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|---------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|------|
| Lab Sample ID: LCS-73521 | Date Analyzed: | 11/06/2020 1436h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | 0.963 | mg/L | E200.7 | 0.0449 | 0.500 | 1.000 | 0 | 96.3 | 85 - 115 | | | | |
| Calcium | 9.09 | mg/L | E200.7 | 0.211 | 1.00 | 10.00 | 0 | 90.9 | 85 - 115 | | | | |
| Lithium | 0.992 | mg/L | E200.7 | 0.0207 | 0.100 | 1.000 | 0 | 99.2 | 80 - 120 | | | | |
| Lab Sample ID: LCS-73520 | Date Analyzed: | 11/09/2020 1709h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | 0.198 | mg/L | E200.8 | 0.000734 | 0.00400 | 0.2000 | 0 | 99.0 | 85 - 115 | | | | |
| Arsenic | 0.195 | mg/L | E200.8 | 0.000298 | 0.00200 | 0.2000 | 0 | 97.4 | 85 - 115 | | | | |
| Barium | 0.190 | mg/L | E200.8 | 0.000544 | 0.00200 | 0.2000 | 0 | 95.1 | 85 - 115 | | | | |
| Cadmium | 0.187 | mg/L | E200.8 | 0.0000742 | 0.000500 | 0.2000 | 0 | 93.4 | 85 - 115 | | | | |
| Chromium | 0.192 | mg/L | E200.8 | 0.00191 | 0.00200 | 0.2000 | 0 | 95.9 | 85 - 115 | | | | |
| Cobalt | 0.193 | mg/L | E200.8 | 0.000300 | 0.00400 | 0.2000 | 0 | 96.4 | 85 - 115 | | | | |
| Lead | 0.193 | mg/L | E200.8 | 0.000448 | 0.00200 | 0.2000 | 0 | 96.5 | 85 - 115 | | | | |
| Molybdenum | 0.191 | mg/L | E200.8 | 0.000652 | 0.00200 | 0.2000 | 0 | 95.6 | 85 - 115 | | | | |
| Selenium | 0.184 | mg/L | E200.8 | 0.000508 | 0.00200 | 0.2000 | 0 | 92.1 | 85 - 115 | | | | |
| Thallium | 0.193 | mg/L | E200.8 | 0.000390 | 0.00200 | 0.2000 | 0 | 96.6 | 85 - 115 | | | | |
| Lab Sample ID: LCS-73520 | Date Analyzed: | 11/12/2020 1031h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | 0.205 | mg/L | E200.8 | 0.000198 | 0.00200 | 0.2000 | 0 | 102 | 85 - 115 | | | | |
| Lab Sample ID: LCS-73605 | Date Analyzed: | 11/10/2020 925h | | | | | | | | | | | |
| Test Code: | HG-DW-245.1 | Date Prepared: | 11/09/2020 1206h | | | | | | | | | | |
| Mercury | 0.00351 | mg/L | E245.1 | 0.0000396 | 0.0000900 | 0.003330 | 0 | 105 | 85 - 115 | | | | |



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: MBLK

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|--------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|--------|--------------|-------|-----------|------|
| Lab Sample ID: MB-73521 | Date Analyzed: | 11/06/2020 1249h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | < 0.500 | mg/L | E200.7 | 0.0449 | 0.500 | | | | | | | | |
| Calcium | < 1.00 | mg/L | E200.7 | 0.211 | 1.00 | | | | | | | | |
| Lithium | < 0.100 | mg/L | E200.7 | 0.0207 | 0.100 | | | | | | | | |
| Lab Sample ID: MB-73520 | Date Analyzed: | 11/09/2020 1705h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | < 0.00400 | mg/L | E200.8 | 0.000734 | 0.00400 | | | | | | | | |
| Arsenic | < 0.00200 | mg/L | E200.8 | 0.000298 | 0.00200 | | | | | | | | |
| Barium | < 0.00200 | mg/L | E200.8 | 0.000544 | 0.00200 | | | | | | | | |
| Cadmium | < 0.000500 | mg/L | E200.8 | 0.0000742 | 0.000500 | | | | | | | | |
| Chromium | < 0.00200 | mg/L | E200.8 | 0.00191 | 0.00200 | | | | | | | | |
| Cobalt | < 0.00400 | mg/L | E200.8 | 0.000300 | 0.00400 | | | | | | | | |
| Lead | < 0.00200 | mg/L | E200.8 | 0.000448 | 0.00200 | | | | | | | | |
| Molybdenum | < 0.00200 | mg/L | E200.8 | 0.000652 | 0.00200 | | | | | | | | |
| Selenium | < 0.00200 | mg/L | E200.8 | 0.000508 | 0.00200 | | | | | | | | |
| Thallium | < 0.00200 | mg/L | E200.8 | 0.000390 | 0.00200 | | | | | | | | |
| Lab Sample ID: MB-73520 | Date Analyzed: | 11/12/2020 1025h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | < 0.00200 | mg/L | E200.8 | 0.000198 | 0.00200 | | | | | | | | |
| Lab Sample ID: MB-73605 | Date Analyzed: | 11/10/2020 923h | | | | | | | | | | | |
| Test Code: | HG-DW-245.1 | Date Prepared: | 11/09/2020 1206h | | | | | | | | | | |
| Mercury | < 0.0000900 | mg/L | E245.1 | 0.0000396 | 0.0000900 | | | | | | | | |



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: MS

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|--------------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|------|
| Lab Sample ID: 2010965-002BMS | Date Analyzed: | 11/06/2020 1442h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Calcium | 411 | mg/L | E200.7 | 4.22 | 20.0 | 20.00 | 384 | 138 | 70 - 130 | | | | 2 |
| Lab Sample ID: 2010965-006BMS | Date Analyzed: | 11/06/2020 1456h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Calcium | 370 | mg/L | E200.7 | 2.11 | 10.0 | 10.00 | 356 | 137 | 70 - 130 | | | | 2 |
| Lab Sample ID: 2010965-002BMS | Date Analyzed: | 11/09/2020 1327h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | 17.8 | mg/L | E200.7 | 0.0898 | 1.00 | 2.000 | 15.6 | 108 | 70 - 130 | | | | |
| Lithium | 5.00 | mg/L | E200.7 | 0.0414 | 0.200 | 2.000 | 3.15 | 92.4 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-006BMS | Date Analyzed: | 11/09/2020 1343h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | 4.30 | mg/L | E200.7 | 0.0449 | 0.500 | 1.000 | 3.18 | 112 | 70 - 130 | | | | |
| Lithium | 2.45 | mg/L | E200.7 | 0.0207 | 0.100 | 1.000 | 1.42 | 103 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-006BMS | Date Analyzed: | 11/09/2020 1830h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | 0.209 | mg/L | E200.8 | 0.000734 | 0.00400 | 0.2000 | 0 | 105 | 75 - 125 | | | | |
| Arsenic | 0.219 | mg/L | E200.8 | 0.000298 | 0.00200 | 0.2000 | 0 | 109 | 75 - 125 | | | | |
| Cadmium | 0.187 | mg/L | E200.8 | 0.0000742 | 0.000500 | 0.2000 | 0 | 93.6 | 75 - 125 | | | | |
| Chromium | 0.193 | mg/L | E200.8 | 0.00191 | 0.00200 | 0.2000 | 0 | 96.5 | 75 - 125 | | | | |
| Lead | 0.183 | mg/L | E200.8 | 0.000448 | 0.00200 | 0.2000 | 0 | 91.4 | 75 - 125 | | | | |
| Molybdenum | 0.217 | mg/L | E200.8 | 0.000652 | 0.00200 | 0.2000 | 0.00133 | 108 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-002BMS | Date Analyzed: | 11/10/2020 2020h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Selenium | 0.461 | mg/L | E200.8 | 0.00102 | 0.00400 | 0.4000 | 0.0669 | 98.6 | 75 - 125 | | | | |



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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: MS

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|--------------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|--------------|
| Lab Sample ID: 2010965-002BMS | Date Analyzed: | 11/09/2020 1758h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | 0.420 | mg/L | E200.8 | 0.00147 | 0.00800 | 0.4000 | 0 | 105 | 75 - 125 | | | | |
| Arsenic | 0.437 | mg/L | E200.8 | 0.000596 | 0.00400 | 0.4000 | 0.000506 | 109 | 75 - 125 | | | | |
| Barium | 0.401 | mg/L | E200.8 | 0.00109 | 0.00400 | 0.4000 | 0.0108 | 97.6 | 75 - 125 | | | | |
| Cadmium | 0.378 | mg/L | E200.8 | 0.000148 | 0.00100 | 0.4000 | 0.000163 | 94.4 | 75 - 125 | | | | |
| Chromium | 0.382 | mg/L | E200.8 | 0.00382 | 0.00400 | 0.4000 | 0 | 95.6 | 75 - 125 | | | | |
| Cobalt | 0.399 | mg/L | E200.8 | 0.000600 | 0.00800 | 0.4000 | 0.0197 | 94.9 | 75 - 125 | | | | |
| Lead | 0.373 | mg/L | E200.8 | 0.000896 | 0.00400 | 0.4000 | 0.000931 | 92.9 | 75 - 125 | | | | |
| Molybdenum | 0.444 | mg/L | E200.8 | 0.00130 | 0.00400 | 0.4000 | 0.0183 | 106 | 75 - 125 | | | | |
| Thallium | 0.376 | mg/L | E200.8 | 0.000780 | 0.00400 | 0.4000 | 0 | 94.0 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-002BMS | Date Analyzed: | 11/12/2020 1042h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | 0.374 | mg/L | E200.8 | 0.000396 | 0.00400 | 0.4000 | 0 | 93.5 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-006BMS | Date Analyzed: | 11/12/2020 1126h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | 0.176 | mg/L | E200.8 | 0.000198 | 0.00200 | 0.2000 | 0 | 87.9 | 75 - 125 | | | | |
| Selenium | 0.202 | mg/L | E200.8 | 0.000508 | 0.00200 | 0.2000 | 0.00423 | 98.9 | 75 - 125 | | | | |
| Lab Sample ID: 2010965-001BMS | Date Analyzed: | 11/10/2020 935h | | | | | | | | | | | |
| Test Code: | HG-DW-245.1 | Date Prepared: | 11/09/2020 1206h | | | | | | | | | | |
| Mercury | 0.000205 | mg/L | E245.1 | 0.0000396 | 0.0000900 | 0.003330 | 0 | 6.16 | 80 - 120 | | | | ¹ |

¹ - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

² - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

2010965-002BMS: Insufficient sample amount was provided to allow for a full amount analysis of the MS/MSD. Reduced sample volume for the MS/MSD was used as a result.



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Laboratory Director

Jose Rocha
QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: MSD

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|---------------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|----------|--------------|--------|-----------|------|
| Lab Sample ID: 2010965-002BMSD | Date Analyzed: | 11/06/2020 1444h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Calcium | 406 | mg/L | E200.7 | 4.22 | 20.0 | 20.00 | 384 | 113 | 70 - 130 | 411 | 1.26 | 20 | |
| Lab Sample ID: 2010965-006BMSD | Date Analyzed: | 11/06/2020 1459h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Calcium | 368 | mg/L | E200.7 | 2.11 | 10.0 | 10.00 | 356 | 118 | 70 - 130 | 370 | 0.513 | 20 | |
| Lab Sample ID: 2010965-002BMSD | Date Analyzed: | 11/09/2020 1330h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | 17.9 | mg/L | E200.7 | 0.0898 | 1.00 | 2.000 | 15.6 | 111 | 70 - 130 | 17.8 | 0.334 | 20 | |
| Lithium | 4.97 | mg/L | E200.7 | 0.0414 | 0.200 | 2.000 | 3.15 | 90.7 | 75 - 125 | 5 | 0.677 | 20 | |
| Lab Sample ID: 2010965-006BMSD | Date Analyzed: | 11/09/2020 1346h | | | | | | | | | | | |
| Test Code: | 200.7-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Boron | 4.30 | mg/L | E200.7 | 0.0449 | 0.500 | 1.000 | 3.18 | 112 | 70 - 130 | 4.3 | 0.0157 | 20 | |
| Lithium | 2.45 | mg/L | E200.7 | 0.0207 | 0.100 | 1.000 | 1.42 | 104 | 75 - 125 | 2.45 | 0.256 | 20 | |
| Lab Sample ID: 2010965-006BMSD | Date Analyzed: | 11/09/2020 1833h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | 0.211 | mg/L | E200.8 | 0.000734 | 0.00400 | 0.2000 | 0 | 106 | 75 - 125 | 0.209 | 0.913 | 20 | |
| Arsenic | 0.221 | mg/L | E200.8 | 0.000298 | 0.00200 | 0.2000 | 0 | 111 | 75 - 125 | 0.219 | 1.12 | 20 | |
| Cadmium | 0.189 | mg/L | E200.8 | 0.0000742 | 0.000500 | 0.2000 | 0 | 94.4 | 75 - 125 | 0.187 | 0.874 | 20 | |
| Chromium | 0.193 | mg/L | E200.8 | 0.00191 | 0.00200 | 0.2000 | 0 | 96.7 | 75 - 125 | 0.193 | 0.305 | 20 | |
| Lead | 0.184 | mg/L | E200.8 | 0.000448 | 0.00200 | 0.2000 | 0 | 92.0 | 75 - 125 | 0.183 | 0.680 | 20 | |
| Molybdenum | 0.217 | mg/L | E200.8 | 0.000652 | 0.00200 | 0.2000 | 0.00133 | 108 | 75 - 125 | 0.217 | 0.0185 | 20 | |
| Lab Sample ID: 2010965-002BMSD | Date Analyzed: | 11/10/2020 2024h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Selenium | 0.461 | mg/L | E200.8 | 0.00102 | 0.00400 | 0.4000 | 0.0669 | 98.4 | 75 - 125 | 0.461 | 0.128 | 20 | |



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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: ME

QC Type: MSD

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|---------------------------------------|----------------|------------------|------------------|-----------|-----------------|---------------|-------------------|------|----------|--------------|--------|-----------|--------------|
| Lab Sample ID: 2010965-002BMSD | Date Analyzed: | 11/09/2020 1802h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Antimony | 0.422 | mg/L | E200.8 | 0.00147 | 0.00800 | 0.4000 | 0 | 105 | 75 - 125 | 0.42 | 0.524 | 20 | |
| Arsenic | 0.437 | mg/L | E200.8 | 0.000596 | 0.00400 | 0.4000 | 0.000506 | 109 | 75 - 125 | 0.437 | 0.0374 | 20 | |
| Barium | 0.402 | mg/L | E200.8 | 0.00109 | 0.00400 | 0.4000 | 0.0108 | 97.8 | 75 - 125 | 0.401 | 0.154 | 20 | |
| Cadmium | 0.379 | mg/L | E200.8 | 0.000148 | 0.00100 | 0.4000 | 0.000163 | 94.7 | 75 - 125 | 0.378 | 0.305 | 20 | |
| Chromium | 0.386 | mg/L | E200.8 | 0.00382 | 0.00400 | 0.4000 | 0 | 96.6 | 75 - 125 | 0.382 | 1.05 | 20 | |
| Cobalt | 0.400 | mg/L | E200.8 | 0.000600 | 0.00800 | 0.4000 | 0.0197 | 95.2 | 75 - 125 | 0.399 | 0.309 | 20 | |
| Lead | 0.372 | mg/L | E200.8 | 0.000896 | 0.00400 | 0.4000 | 0.000931 | 92.8 | 75 - 125 | 0.373 | 0.136 | 20 | |
| Molybdenum | 0.449 | mg/L | E200.8 | 0.00130 | 0.00400 | 0.4000 | 0.0183 | 108 | 75 - 125 | 0.444 | 1.20 | 20 | |
| Thallium | 0.377 | mg/L | E200.8 | 0.000780 | 0.00400 | 0.4000 | 0 | 94.2 | 75 - 125 | 0.376 | 0.189 | 20 | |
| Lab Sample ID: 2010965-002BMSD | Date Analyzed: | 11/12/2020 1046h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | 0.370 | mg/L | E200.8 | 0.000396 | 0.00400 | 0.4000 | 0 | 92.4 | 75 - 125 | 0.374 | 1.18 | 20 | |
| Lab Sample ID: 2010965-006BMSD | Date Analyzed: | 11/12/2020 1130h | | | | | | | | | | | |
| Test Code: | 200.8-W | Date Prepared: | 11/05/2020 1007h | | | | | | | | | | |
| Beryllium | 0.171 | mg/L | E200.8 | 0.000198 | 0.00200 | 0.2000 | 0 | 85.5 | 75 - 125 | 0.176 | 2.78 | 20 | |
| Selenium | 0.204 | mg/L | E200.8 | 0.000508 | 0.00200 | 0.2000 | 0.00423 | 99.8 | 75 - 125 | 0.202 | 0.861 | 20 | |
| Lab Sample ID: 2010965-001BMSD | Date Analyzed: | 11/10/2020 937h | | | | | | | | | | | |
| Test Code: | HG-DW-245.1 | Date Prepared: | 11/09/2020 1206h | | | | | | | | | | |
| Mercury | 0.000187 | mg/L | E245.1 | 0.0000396 | 0.0000900 | 0.003330 | 0 | 5.61 | 80 - 120 | 0.000205 | 9.36 | 20 | ¹ |

¹ - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

2010965-002BMSD: Insufficient sample amount was provided to allow for a full amount analysis of the MS/MSD. Reduced sample volume for the MS/MSD was used as a result.



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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: WC

QC Type: DUP

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|---|----------------|------------|------------|------|-----------------|---------------|-------------------|------|--------|--------------|-------|-----------|------|
| Lab Sample ID: 2010965-001ADUP
Test Code: PH-4500H+B | Date Analyzed: | 10/29/2020 | 1745h | | | | | | | | | | |
| pH @ 25° C | 7.77 | pH Units | SM4500-H+B | 1.00 | 1.00 | | | | | 7.79 | 0.257 | 5 | |
| Lab Sample ID: 2010965-012ADUP
Test Code: PH-4500H+B | Date Analyzed: | 10/29/2020 | 1745h | | | | | | | | | | |
| pH @ 25° C | 8.14 | pH Units | SM4500-H+B | 1.00 | 1.00 | | | | | 8.16 | 0.245 | 5 | |
| Lab Sample ID: 2010965-001ADUP
Test Code: TDS-W-2540C | Date Analyzed: | 11/02/2020 | 1420h | | | | | | | | | | |
| Total Dissolved Solids | 32,800 | mg/L | SM2540C | 80.0 | 100 | | | | | 32900 | 0.365 | 5 | |



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: WC

QC Type: LCS

| Analyte | | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|------------------------|-------------|----------------|------------------|------------|--------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|------|
| Lab Sample ID: | LCS-R145454 | Date Analyzed: | 11/10/2020 658h | | | | | | | | | | | |
| Test Code: | 300.0-W | | | | | | | | | | | | | |
| Chloride | | 4.86 | mg/L | E300.0 | 0.0565 | 0.100 | 5.000 | 0 | 97.2 | 90 - 110 | | | | |
| Fluoride | | 4.97 | mg/L | E300.0 | 0.0240 | 0.100 | 5.000 | 0 | 99.5 | 90 - 110 | | | | |
| Sulfate | | 5.00 | mg/L | E300.0 | 0.136 | 0.750 | 5.000 | 0 | 100 | 90 - 110 | | | | |
| Lab Sample ID: | LCS-R145630 | Date Analyzed: | 11/13/2020 958h | | | | | | | | | | | |
| Test Code: | 300.0-W | | | | | | | | | | | | | |
| Fluoride | | 5.16 | mg/L | E300.0 | 0.0240 | 0.100 | 5.000 | 0 | 103 | 90 - 110 | | | | |
| Lab Sample ID: | LCS-R144972 | Date Analyzed: | 10/29/2020 1745h | | | | | | | | | | | |
| Test Code: | PH-4500H+B | | | | | | | | | | | | | |
| pH @ 25° C | | 9.04 | pH Units | SM4500-H+B | 1.00 | 1.00 | 9.000 | 0 | 100 | 98 - 102 | | | | |
| Lab Sample ID: | LCS-R145157 | Date Analyzed: | 11/02/2020 1420h | | | | | | | | | | | |
| Test Code: | TDS-W-2540C | | | | | | | | | | | | | |
| Total Dissolved Solids | | 184 | mg/L | SM2540C | 8.00 | 10.0 | 205.0 | 0 | 89.8 | 80 - 120 | | | | |



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: WC

QC Type: MBLK

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|----------------------------------|----------------|------------|---------|--------|-----------------|---------------|-------------------|------|--------|--------------|-------|-----------|------|
| Lab Sample ID: MB-R145454 | Date Analyzed: | 11/10/2020 | 641h | | | | | | | | | | |
| Test Code: | 300.0-W | | | | | | | | | | | | |
| Chloride | < 0.100 | mg/L | E300.0 | 0.0565 | 0.100 | | | | | | | | |
| Fluoride | < 0.100 | mg/L | E300.0 | 0.0240 | 0.100 | | | | | | | | |
| Sulfate | < 0.750 | mg/L | E300.0 | 0.136 | 0.750 | | | | | | | | |
| Lab Sample ID: MB-R145630 | Date Analyzed: | 11/13/2020 | 941h | | | | | | | | | | |
| Test Code: | 300.0-W | | | | | | | | | | | | |
| Fluoride | < 0.100 | mg/L | E300.0 | 0.0240 | 0.100 | | | | | | | | |
| Lab Sample ID: MB-R145157 | Date Analyzed: | 11/02/2020 | 1420h | | | | | | | | | | |
| Test Code: | TDS-W-2540C | | | | | | | | | | | | |
| Total Dissolved Solids | < 10.0 | mg/L | SM2540C | 8.00 | 10.0 | | | | | | | | |



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QA Officer

QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: WC

QC Type: MS

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|-------------------------------|----------------|------------------|--------|------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|------|
| Lab Sample ID: 2010965-008AMS | Date Analyzed: | 11/10/2020 1351h | | | | | | | | | | | |
| Test Code: 300.0-W | | | | | | | | | | | | | |
| Chloride | 7,040 | mg/L | E300.0 | 56.5 | 100 | 5,000 | 2170 | 97.4 | 90 - 110 | | | | |
| Fluoride | 5,010 | mg/L | E300.0 | 24.0 | 100 | 5,000 | 0 | 100 | 90 - 110 | | | | |
| Sulfate | 10,900 | mg/L | E300.0 | 136 | 750 | 5,000 | 5860 | 99.9 | 90 - 110 | | | | |



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QC SUMMARY REPORT

Client: PacifiCorp

Lab Set ID: 2010965

Project: Hunter Power Plant - CCR / Group B

Contact: Jeff Tucker

Dept: WC

QC Type: MSD

| Analyte | Result | Units | Method | MDL | Reporting Limit | Amount Spiked | Spike Ref. Amount | %REC | Limits | RPD Ref. Amt | % RPD | RPD Limit | Qual |
|--------------------------------|----------------|------------|--------|------|-----------------|---------------|-------------------|------|----------|--------------|-------|-----------|------|
| Lab Sample ID: 2010965-008AMSD | Date Analyzed: | 11/10/2020 | 1408h | | | | | | | | | | |
| Test Code: 300.0-W | | | | | | | | | | | | | |
| Chloride | 7,120 | mg/L | E300.0 | 56.5 | 100 | 5,000 | 2170 | 98.9 | 90 - 110 | 7040 | 1.08 | 20 | |
| Fluoride | 5,070 | mg/L | E300.0 | 24.0 | 100 | 5,000 | 0 | 101 | 90 - 110 | 5010 | 1.21 | 20 | |
| Sulfate | 10,900 | mg/L | E300.0 | 136 | 750 | 5,000 | 5860 | 102 | 90 - 110 | 10900 | 0.742 | 20 | |

WORK ORDER Summary

Work Order: **2010965**

Page 1 of 5

Client: PacifiCorp

Due Date: 11/12/2020

Client ID: PAC900

Contact: Jeff Tucker

Project: Hunter Power Plant - CCR / Group B

QC Level: II+

WO Type: Project

Comments: QC2+. Include EDD. RADS sent to ALS-Ft Collins. cc: Dennis Vanderbeek & Brad Giles. cc: Report to mshirley@waterenvtech.com, Laura Watson and Dave Erickson. Footnote: all received out of hold for pH except for sample #'s 10 & 12;

VNS

| Sample ID | Client Sample ID | Collected Date | Received Date | Test Code | Matrix | Sel | Storage | |
|--------------|------------------|------------------|------------------|---|--------|-------------------------------------|-----------|---|
| 2010965-001A | ELF-10 | 10/28/2020 1750h | 10/29/2020 1519h | 300.0-W | Water | <input checked="" type="checkbox"/> | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | <input type="checkbox"/> | DF-WC | |
| | | | | TDS-W-2540C | | <input type="checkbox"/> | DF-WC | |
| 2010965-001B | | | | 200.7-W | | <input checked="" type="checkbox"/> | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | <input type="checkbox"/> | DF-Metals | |
| | | | | 200.8-W | | <input checked="" type="checkbox"/> | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | <input type="checkbox"/> | DF-Metals | |
| | | | | HG-DW-245.1 | | <input type="checkbox"/> | DF-Metals | |
| | | | | HG-DW-PR | | <input type="checkbox"/> | DF-Metals | |
| 2010965-001C | | | | OUTSIDE LAB | | <input type="checkbox"/> | ALS | 2 |
| 2010965-002A | ELF-11 | 10/28/2020 1055h | 10/29/2020 1519h | 300.0-W | Water | <input checked="" type="checkbox"/> | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | <input type="checkbox"/> | DF-WC | |
| | | | | TDS-W-2540C | | <input type="checkbox"/> | DF-WC | |
| 2010965-002B | | | | 200.7-W | | <input checked="" type="checkbox"/> | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | <input type="checkbox"/> | DF-Metals | |
| | | | | 200.8-W | | <input checked="" type="checkbox"/> | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | <input type="checkbox"/> | DF-Metals | |
| | | | | HG-DW-245.1 | | <input type="checkbox"/> | DF-Metals | |
| | | | | HG-DW-PR | | <input type="checkbox"/> | DF-Metals | |
| 2010965-002C | | | | OUTSIDE LAB | | <input type="checkbox"/> | ALS | 2 |
| 2010965-003A | ELF-12 | 10/28/2020 1600h | 10/29/2020 1519h | 300.0-W | Water | <input checked="" type="checkbox"/> | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | <input type="checkbox"/> | DF-WC | |
| | | | | TDS-W-2540C | | <input type="checkbox"/> | DF-WC | |

WORK ORDER Summary

Work Order: **2010965**

Page 2 of 5

Client: PacifiCorp

Due Date: 11/12/2020

| Sample ID | Client Sample ID | Collected Date | Received Date | Test Code | Matrix | Sel | Storage | |
|--------------|------------------|------------------|------------------|---|--------|-----|-----------|---|
| 2010965-003B | ELF-12 | 10/28/2020 1600h | 10/29/2020 1519h | 200.7-W | Water | ✓ | DF-Metals | 1 |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-003C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-004A | ELF-13 | 10/28/2020 1305h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-004B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-004C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-005A | ELF-14 | 10/28/2020 1225h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-005B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-005C | | | | OUTSIDE LAB | | | ALS | 2 |

WORK ORDER Summary

Work Order: **2010965**

Page 3 of 5

Client: PacifiCorp

Due Date: 11/12/2020

| Sample ID | Client Sample ID | Collected Date | Received Date | Test Code | Matrix | Sel | Storage | |
|--------------|------------------|------------------|------------------|---|--------|-----|-----------|---|
| 2010965-006A | ELF-2 | 10/28/2020 1042h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-006B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-006C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-007A | ELF-3 | 10/28/2020 1700h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-007B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-007C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-008A | ELF-4 | 10/28/2020 1452h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-008B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |

WORK ORDER Summary

Work Order: **2010965**

Page 4 of 5

Client: PacifiCorp

Due Date: 11/12/2020

| Sample ID | Client Sample ID | Collected Date | Received Date | Test Code | Matrix | Sel | Storage | |
|--------------|------------------|------------------|------------------|---|--------|-----------|-----------|---|
| 2010965-008B | ELF-4 | 10/28/2020 1452h | 10/29/2020 1519h | HG-DW-PR | Water | | DF-Metals | 1 |
| 2010965-008C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-009A | ELF-8 | 10/28/2020 1140h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-009B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | DF-Metals | | |
| | | | | HG-DW-PR | | DF-Metals | | |
| 2010965-009C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-010A | ELF-9 | 10/29/2020 0948h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-010B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | DF-Metals | | |
| | | | | HG-DW-PR | | DF-Metals | | |
| 2010965-010C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-011A | Duplicate | 10/28/2020 | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: CL F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-011B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |

WORK ORDER Summary

Work Order: **2010965** Page 5 of 5

Client: PacifiCorp

Due Date: 11/12/2020

| Sample ID | Client Sample ID | Collected Date | Received Date | Test Code | Matrix | Sel | Storage | |
|--------------|------------------|------------------|------------------|---|--------|-----|-----------|---|
| 2010965-011B | Duplicate | 10/28/2020 | 10/29/2020 1519h | 200.8-W | Water | ✓ | DF-Metals | 1 |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-011C | | | | OUTSIDE LAB | | | ALS | 2 |
| 2010965-012A | Field Blank | 10/29/2020 1045h | 10/29/2020 1519h | 300.0-W | Water | ✓ | DF-WC | 1 |
| | | | | 3 SEL Analytes: Cl F SO4 | | | | |
| | | | | PH-4500H+B | | | DF-WC | |
| | | | | TDS-W-2540C | | | DF-WC | |
| 2010965-012B | | | | 200.7-W | | ✓ | DF-Metals | |
| | | | | 3 SEL Analytes: B CA LI | | | | |
| | | | | 200.7-W-PR | | | DF-Metals | |
| | | | | 200.8-W | | ✓ | DF-Metals | |
| | | | | 11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL | | | | |
| | | | | 200.8-W-PR | | | DF-Metals | |
| | | | | HG-DW-245.1 | | | DF-Metals | |
| | | | | HG-DW-PR | | | DF-Metals | |
| 2010965-012C | | | | OUTSIDE LAB | | | ALS | 2 |

AVADIS Only - One chemical sample expired signature cap

Test Code

PH-4500H+B



American West Analytical Laboratories

3440 S. 700 W. Salt Lake City, UT 84119
Phone # (801) 263-8686 Toll Free # (888) 263-8686
Fax # (801) 263-8687 Email: awal@awal-labs.com

www.awal-labs.com

CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (POL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

2010965

AWAL Lab Sample Set #

Page 1 of 2

Client: **PacifiCorp Environmental Remediation**
Address: **1407 West North Temple Ste 270**
City, State, Zip: **Salt Lake City, UT 84140**
Contact: **Jeff Tucker**
Phone #: **(801) 220-267** Cell #:
E-mail: **jeff.tucker@pacificorp.com; dennis.vanderbeek@pacificorp.com; brad.giles@pacificorp.com**
Project Name: **Hunter Power Plant - CCR**
Project #:
PO #:
Sampler Name:

| QC Level: | | Turn Around Time: | | Rush sets received after 4:00 pm are considered received on the next business day. | | Due Date: | | | | | | |
|--|--------|-------------------|--------------|--|---------------|------------|--------------|---------------------------|--------------------------|---|--|--|
| 2+ | | Standard | | | | 11/12/20 | | | | | | |
| Report down to the MDL
<input type="checkbox"/> Include EDD:
<input checked="" type="checkbox"/> Lab Filter for: Metals
<input type="checkbox"/> Field Filtered For: | | | | Unless other arrangements have been made, signed reports will be emailed by 5:00 pm on the day they are due. | | | | | | | | |
| For Compliance With:
<input type="checkbox"/> NELAP
<input type="checkbox"/> RCRA
<input type="checkbox"/> CWA
<input type="checkbox"/> SDWA
<input type="checkbox"/> ELAP / A2LA
<input type="checkbox"/> NLLAP
<input type="checkbox"/> Non-Compliance
<input type="checkbox"/> Other: | | | | Laboratory Use Only
COC Tape Was:
1 Present on Outer Package Y N NA
2 Unbroken on Outer Package Y N NA
3 Present on Sample Y N NA
4 Unbroken on Sample Y N NA | | | | | | | | |
| Known Hazards & Sample Comments | | | | Samples Were:
1 Shipped or hand delivered
2 Ambient or Chilled
3 Temperature 0.3 °C
4 Received Intact Y N
5 Properly Preserved Y N Checked at bench
PH out of hold except received within Holding Times Y N #1510 & 12 | | | | | | | | |
| Sample Site ID: | | Date Sampled | Time Sampled | # of Containers | Sample Matrix | TDS A2540C | pH A4500-H B | Chloride / Sulfate E300.0 | Fluoride A4500-F C 300.0 | Sb, As, Ba, Be, Bi, Cd, Ca, Cr, Co, Pb, Li, Mo, Se, Ti, Hg E200.7 / E200.8 / E245.1 | Radium A4500-R 226 & 228 (separate & combined) | |
| 1 | ELF-10 | 10/28/20 | 17:50 | 4 | W | X | X | X | X | X | X | |
| 2 | ELF-11 | 10-28-20 | 10:55 | 4 | W | X | X | X | X | X | X | |
| 3 | ELF-12 | 10-28-20 | 16:00 | 4 | W | X | X | X | X | X | X | |
| 4 | ELF-13 | 10-28-20 | 13:05 | 4 | W | X | X | X | X | X | X | |
| 5 | ELF-14 | 10-28-20 | 12:25 | 4 | W | X | X | X | X | X | X | |
| 6 | ELF-15 | No Sample | | 4 | W | X | X | X | X | X | X | |
| 7 | ELF-2 | 10/29/20 | 10:42 | 4 | W | X | X | X | X | X | X | |
| 8 | ELF-3 | 10-28-20 | 17:00 | 4 | W | X | X | X | X | X | X | |
| 9 | ELF-4 | 10-28-20 | 14:52 | 4 | W | X | X | X | X | X | X | |
| 10 | ELF-5 | No Sample | | 4 | W | X | X | X | X | X | X | |
| 11 | ELF-6 | No Sample | | 4 | W | X | X | X | X | X | X | |
| 12 | ELF-7 | No Sample | | 4 | W | X | X | X | X | X | X | |
| 13 | ELF-8 | 10-28-20 | 11:40 | 4 | W | X | X | X | X | X | X | |
| 14 | ELF-9 | 10/29/20 | 9:48 | 4 | W | X | X | X | X | X | X | |

| | | | |
|---|---|--|---|
| Relinquished by:
Signature: Dennis Vanderbeek | Date: 10-29-20
Time: 15:19 | Received by:
Signature: Denise Brown | Date: 10/29/20
Time: 15:19 |
| Print Name: Dennis Vanderbeek | Date:
Time: | Print Name: Denise Brown | Date:
Time: |
| Relinquished by:
Signature: | Date:
Time: | Received by:
Signature: | Date:
Time: |
| Print Name: | Date:
Time: | Print Name: | Date:
Time: |

| |
|-----------------------|
| Special Instructions: |
| GROUP B |
| |
| |
| |
| |
| |
| |
| |
| |



**American West
Analytical Laboratories**

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CHAIN OF CUSTODY

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AWAL Lab Sample Set #

Page 2 of 2

Due Date: **11/12/20**

Unless other arrangements have been made, signed reports will be emailed by **5:00 pm** on the day they are due.

Laboratory Use Only

COC Tape Was:

1 Present on Outer Package
Y N **NA**

2 Unbroken on Outer Package
Y N **NA**

3 Present on Sample
Y N **NA**

4 Unbroken on Sample
Y N **NA**

Samples Were:

1 Shipped **Hand Delivered**

2 Ambient Controlled **0.3** °C

3 Temperature **0.3** °C

4 Received Intact
Y N **NA**

5 Properly Preserved
Y N **NA**

6 Received Within Holding Times
Y N **NA**

7 Sample Labels and COC Record Match?
Y N **NA**

Client: **PacifiCorp Environmental Remediation**
Address: **1407 West North Temple Ste 270**
City, State, Zip: **Salt Lake City, UT 84140**
Contact: **Jeff Tucker**
Phone #: **(801) 220-267** Call #:
E-mail: **jeff.tucker@pacifiCorp.com; dennis.vanderbeek@pacifiCorp.com; brad.giles@pacifiCorp.com**
Project Name: **Hunter Power Plant - CCR**
Project #:
PO #:
Sampler Name:

| Sample Site ID: | Date Sampled | Time Sampled | # of Containers | Sample Matrix | TDS A7540C | pH A4500-HB | Chloride / Sulfate L300.0 | Fluoride A4500-F | Sb, As, Ba, Be, Bi, Bo, Cd, Ca, Cr, Co, Pb, Li, Mn, Se, Ti, Hg E200.7 / E200.8 / E245.1 | Radium A4500-Ra | Other |
|-----------------|--------------|--------------|-----------------|---------------|------------|-------------|---------------------------|------------------|---|-----------------|-------|
| 1 Duplicate | 10-28-20 | | 4 | W | X | X | X | X | X | X | |
| 2 Field Blank | 10-29-20 | 10:45 | 4 | W | X | X | X | X | X | X | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |

Relinquished by: **Dennis Vanderbeek**
Signature: **Dennis Vanderbeek**
Date: **10-29-20**
Time: **15:19**
Print Name: **Dennis Vanderbeek**
Relinquished by: **Dennis Vanderbeek**
Signature: **Dennis Vanderbeek**
Date: **10-29-20**
Time: **15:19**
Print Name: **Dennis Vanderbeek**

Received by: **Dennis Brun**
Signature: **Dennis Brun**
Date: **10-29-20**
Time: **15:19**
Print Name: **Dennis Brun**
Received by: **Dennis Brun**
Signature: **Dennis Brun**
Date: **10-29-20**
Time: **15:19**
Print Name: **Dennis Brun**

Special Instructions: **GROUP B**

By signing this Chain of Custody you are agreeing to permit AWAL to subcontract any analyses not normally performed at AWAL.

REV 10/14/2010

Lab Set ID: 2010965

pH Lot #: 16506

Preservation Check Sheet

Sample Set Extension and pH

[illegible]

Procedure:

- 1) Pour a small amount of sample in the sample lid
- 2) Pour sample from lid gently over wide range pH paper
- 3) **Do Not** dip the pH paper in the sample bottle or lid
- 4) If sample is not preserved, properly list its extension and receiving pH in the appropriate column above
- 5) Flag COC, notify client if requested
- 6) Place client conversation on COC
- 7) Samples may be adjusted

Frequency: All samples requiring preservation

- * The sample required additional preservative upon receipt.
- + The sample was received unpreserved.
- ▲ The sample was received unpreserved and therefore preserved upon receipt.
- # The sample pH was unadjustable to a pH < 2 due to the sample matrix.
- The sample pH was unadjustable to a pH > ____ due to the sample matrix interference.

American West
Analytical Laboratories

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CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AVAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

AWAL Lab Sample Set #

Page 1 of 2

Client: **American West Analytical Laboratories**

Address: 3440 S. 780 W.

City, State, Zip: **Salt Lake City, UT 84119**

Contact: **Elona Hayward**

Phone #: (801) 263-8686

Cell #:

E-mail: elona@awal-labs.com; denise@awal-labs.com; jose@awal-labs.com

Project Name: **Hunter Power Plant - CCR**

Project #:

PO #: 2010965

Sampler Name:

| Sample ID: | | | Date Sampled | Time Sampled | # of Containers | Sample N | Radium | Known Hazards & Sample Comments | | | | | | | | | | |
|------------|-------------|------------|--------------|--------------|-----------------|----------|--------|---------------------------------|--|--|--|--|--|--|--|--|--|--|
| 1 | ELF-10 | 10/28/2020 | 17:50 | 2 | W | X | | | | | | | | | | | | 2 Ambient or Chilled |
| 2 | ELF-11 | 10/28/2020 | 10:55 | 2 | W | X | | | | | | | | | | | | 3 Temperature _____ °C |
| 3 | ELF-12 | 10/28/2020 | 16:00 | 2 | W | X | | | | | | | | | | | | 4 Received Intact
Y N |
| 4 | ELF-13 | 10/28/2020 | 13:05 | 2 | W | X | | | | | | | | | | | | 5 Properly Preserved
Y N Checked at bench |
| 5 | ELF-14 | 10/28/2020 | 12:25 | 2 | W | X | | | | | | | | | | | | 6 Received Within
Holding Times
Y N |
| 6 | ELF-2 | 10/28/2020 | 10:42 | 2 | W | X | | | | | | | | | | | | |
| 7 | ELF-3 | 10/28/2020 | 17:00 | 2 | W | X | | | | | | | | | | | | |
| 8 | ELF-4 | 10/28/2020 | 14:52 | 2 | W | X | | | | | | | | | | | | |
| 9 | ELF-8 | 10/28/2020 | 11:40 | 2 | W | X | | | | | | | | | | | | |
| 10 | ELF-9 | 10/29/2020 | 9:48 | 2 | W | X | | | | | | | | | | | | |
| 11 | Duplicate | 10/28/2020 | | 2 | W | X | | | | | | | | | | | | Sample Labels and COC Record Match?
Y N |
| 12 | Field Blank | 10/29/2020 | 10:45 | 2 | W | X | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | |

| | | | | |
|---|-----------------------|----------------------------|-------|--|
| Relinquished by:
Signature: <i>Elmer Hayward</i> | Date: <i>10/29/20</i> | Received by:
Signature: | Date: | Special Instructions:

QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS,

MS/MSD performed on customer sample

Samples sent to ALS - Ft. Collins. |
| Print Name: <i>Elmer Hayward</i> | Time: <i>10:00</i> | Print Name: | Time: | |
| Relinquished by:
Signature: | Date: | Received by:
Signature: | Date: | |
| Print Name: | Time: | Print Name: | Time: | |
| Relinquished by:
Signature: | Date: | Received by:
Signature: | Date: | |
| Print Name: | Time: | Print Name: | Time: | |

ATTACHMENT C:
Remedy Selection – Progress Reports

Date: October 10, 2019
To: Jeff Tucker
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 semi-annual progress report for remedy selection.

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 will be addressed in Remedy Selection Report.
- **9/23/2019:** Contract finalized to inspect each horizontal well using a mobile camera. Equipment will be on site during the inspection to clean the wells if warranted.

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

- Completion of a Remedy Selection Report;
- Completion of a remedy optimization plan; and
- Initiate remedy optimization.

Date: April 13, 2020
To: Jeff Tucker
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.

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- **9/23/2019:** Contract 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 openings.

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

- Complete horizontal well inspections using a smaller remote camera system;
- Completion of a Remedy Selection Report;
- Completion of a well optimization plan; and
- Initiate well optimization.

Date: October 8, 2020
To: Jeff Tucker
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:

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- **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 will be addressed in Remedy Selection Report.
- **9/23/2019:** Contract 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 openings.
- **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 are being 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.

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

- Complete horizontal well inspections using a smaller remote camera system;
- Completion of a well optimization plan; and
- Initiate well optimization.