

ANNUAL GROUNDWATER MONITORING REPORT FOR 2021

COLORADO SPRINGS UTILITIES' CLEAR SPRING RANCH Coal Combustion Residuals Landfill El Paso County, Colorado

January 31, 2022

Prepared For:

40 CFR Part 257.90(e)

and

Colorado Department of Public Health & Environment
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1.0 EXECUTIVE SUMMARY

During the 2021 reporting period, Colorado Springs Utilities' (Utilities') Clear Spring Ranch (CSR) Coal Combustion Residuals (CCR) Landfill was operating pursuant to the assessment monitoring program set forth in 40 CFR §257.95. The landfill entered assessment monitoring in 2018.

During 2021, the following monitoring wells were determined to have a statistically significant increase over background for the following EPA CCR Rule Appendix III constituents pursuant to 40 CFR §257.94(e):

- ▼ Boron within monitoring wells SC-11, SC-12, SC-13, and SC-14
- ▼ Fluoride within monitoring well SC-12

EPA CCR Rule Appendix IV constituent selenium was measured in downgradient well SC-10 at a statistically significant level exceeding the Groundwater Protection Standards (GWPS) during the second semi-annual sampling event. Utilities is responding to this finding in accordance with §257.95(g) of EPA's CCR Rule.

2.0 INTRODUCTION

This annual report summarizes the groundwater monitoring activities performed during 2021 in association with the CCR Landfill at Utilities' CSR. The landfill is located west-southwest of the intersection of Interstate 25 and Ray Nixon Road (Exit 125) in El Paso County, Colorado. CCR from Utilities' Ray Nixon Power Plant is placed in the landfill. CCR from Utilities' Martin Drake Power Plant was being placed in the landfill; however, the Martin Drake Power Plant ceased operation of its coal-burning units in Fall 2021 and CCR is no longer being generated at this power plant.

The CCR Landfill is regulated by the U.S. Environmental Protection Agency (EPA), the Colorado Department of Public Health & Environment (CDPHE), and El Paso County. The land-use is authorized via a Certificate of Designation (CD) obtained from El Paso County (CD #004-001).

The groundwater monitoring activities were performed for compliance with the EPA's Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (40 CFR §257.50 through §257.107) (EPA CCR Rule) and the CDPHE's Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part 1, Section 2.2 - Ground Water Monitoring).

The groundwater monitoring activities were conducted in general accordance with the Coal Combustion Residuals Landfill Groundwater Detection Monitoring Plan (AECOM 2017). This Monitoring Plan was approved by the CDPHE on November 14, 2017 (CDPHE 2017).

This report fulfills the EPA's, CDPHE's, and El Paso County's annual reporting requirements.

2.1 Groundwater Classification and Management

From its inception in the late 1970's, the CCR Landfill has been designed and operated to protect the Fountain Creek Alluvial Aquifer, which is the closest aquifer to the site used for drinking water purposes. The CCR Landfill is located approximately 0.5 miles upgradient of a Retention Dam, described below. The Fountain Creek Alluvial Aquifer is located approximately 0.5 miles downgradient of the Retention Dam. There are no drinking water or agricultural wells within the CD Area, in which the CCR Landfill is located.

To protect the Fountain Creek Alluvial Aquifer, groundwater associated with the CCR Landfill is managed via a Retention Dam and pump back system. The Retention Dam was constructed downgradient of the CCR Landfill in 1978 to inhibit the off-site migration of surface water and groundwater. The dam has a bentonite core and is keyed into the underlying Pierre Shale bedrock. To improve the dam's performance, in the 1990s, Utilities installed a bentonite barrier wall along the upgradient toe of the dam, and a french drain and pump back system downgradient of the dam. The french drain captures water seepage through the dam. The drain extends for approximately 525 feet along the southern portion of the dam. The french drain's collection trench is gravel filled and slopes towards a sump located at the northern end of the trench. An extraction well and pump remove water collected in the sump and pump it back to the upgradient Retention Dam pond. The dam is registered with and inspected by the Office of the State Engineer - Division of Water Resources - Dam Safety Branch (Dam I.D. #100401). A site plan is presented in Appendix A.

3.0 GROUNDWATER FLOW ANALYSIS AND GEOLOGIC PROFILE

The CCR Landfill is located within a small, west-east trending topographic depression that is underlain with, and bounded to the north and south, by Pierre Shale. An investigation of CSR involving laboratory hydraulic conductivity tests on cores of un-weathered Pierre Shale indicated that the Pierre Shale is essentially impermeable (Haley & Aldrich 1994). The surficial geology consists of approximately 4 to 50 feet of alluvial sediments deposited on top of the Pierre Shale (Layne Western 1977).

The alluvial sediments overlying the Pierre Shale formation include the Piney Creek, Broadway, Louviers, and Slocum Alluviums. The alluvium is concentrated in low areas and drainages with Pierre Shale generally present near the ground surface of ridges. The groundwater bearing matrix generally consists of silt, sand, clay, gravel, sandy clay, silty sand, sand with silt, clayey gravel, and sand with clay. Most of this alluvium is poorly-sorted and fine-grained with silt-sized materials predominating. The exploratory boreholes and monitoring wells installed to date suggest that groundwater does not occur as a continuous saturated zone beneath the CD area. It is localized along the historic and current ephemeral channels with little to no groundwater present on the bedrock ridges that border the site (Haley & Aldrich 1995).

Groundwater elevation measurements collected on September 29, 2021 were used to interpolate a potentiometric groundwater surface, which is depicted within Appendix A – Figure 2. The groundwater surface data suggests that groundwater beneath the CCR Landfill generally flows in a southeasterly direction towards the Retention Dam.

4.0 GROUNDWATER QUALITY SAMPLING AND ANALYSIS

As detailed in the CCR Landfill Groundwater Detection Monitoring Plan, the current groundwater quality monitoring well network for the CCR Landfill is comprised of five background wells (CC-1, FC-1, FC-2, FC-3A, & FC-3B), four downgradient wells (SC-10, SC-11, SC-12, & SC-13) along the eastern edge of the landfill, and one cross gradient well (SC-14) on the south side of the landfill. Two rounds of semi-annual Appendix III detection monitoring and Appendix IV assessment monitoring groundwater samples were collected from these wells in March 2021 and September 2021. The locations of the monitoring wells are depicted within Appendix A – Figure 2.

Groundwater samples were collected in general accordance with the 2017 CCR Landfill Groundwater Detection Monitoring Plan. The monitoring wells were purged using dedicated bladder pumps with tubing; after which, the groundwater samples were collected from the discharge tube of the bladder pump directly

into laboratory-supplied sample containers. The sample containers were then labeled and placed into an insulated ice-chilled sample cooler. Samples were hand delivered to the analytical laboratory.

In 2018, Utilities' CCR Landfill migrated from Detection Monitoring to Assessment Monitoring. Assessment Monitoring is required whenever a statistically significant increase over background levels has been detected for one or more of the Detection Monitoring constituents. Assessment Monitoring must continue until concentrations of all Detection and Assessment Monitoring constituents are determined to be at or below background values using statistical procedures for two consecutive sampling events.

Boron and fluoride have been measured at concentrations estimated statistically as being significantly higher than background and have not been determined to be at or below background values using statistical procedures for two consecutive sampling events. Therefore, both Detection Monitoring and Assessment Monitoring continued throughout 2021.

4.1 Detection Monitoring

During 2021, Utilities collected groundwater samples semi-annually from the monitoring wells listed in Section 4.0 above and analyzed the samples using EPA and/or industry accepted methods for the Detection Monitoring constituents listed in Appendix III of the EPA CCR Rule (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids). The laboratory analytical results and sampling dates are summarized in the table presented in Appendix C. Copies of the analytical reports and chain of custody documentation are presented in Appendix D.

4.2 Assessment Monitoring

During 2021, Utilities collected groundwater samples semi-annually from the monitoring wells listed in Section 4.0 above and analyzed the samples using EPA and/or industry accepted methods for the Assessment Monitoring constituents listed in Appendix IV of the EPA CCR Rule (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, radium 226, radium 228, selenium, and thallium). The laboratory analytical results and sampling dates are summarized in the table presented in Appendix C. Copies of the analytical reports and chain of custody documentation are presented in Appendix D.

4.3 Quality Assurance / Quality Control

Quality assurance and quality control (QA/QC) measures were implemented to ensure the reliability and validity of field and analytical data. Appendix D contains copies of the laboratory analytical reports along with QA/QC data. The QA/QC data includes duplicate samples (identified as Well ID_Dup), equipment / decontamination blanks (identified by Equip-Blk), method blanks (identified as LRB – Lab Reagent Blank), matrix spike sample results, and laboratory control sample results.

The equipment blanks were collected using laboratory-provided distilled water. Analytes were not detected in the equipment blank samples. During the March 2021 sampling event duplicate samples were collected from monitoring wells FC-3A and SC-12, and during the September 2021 sampling event duplicate samples were collected from monitoring wells FC-3B and SC-13. Parent / duplicate sample relative percent differences were generally less than 20% and duplicate sample results are presented in Appendix C tables.

Utilities reviewed the analytical results for laboratory QC samples. Review included chain-of-custody record and laboratory-receipt form to verify custody, sample holding-times were met, and samples were properly handled from collection through laboratory analysis. Utilities verified that the laboratory reporting limits for

analytes were below applicable regulatory limits (MCL and CCR Rule standards). Laboratory quality control activities were included and are discussed in the Appendix D laboratory report case narratives. Significant QA/QC anomalies were not identified, and all data was determined to be useable.

4.4 Monitoring Well Installation, Repair and Abandonment

No CCR Landfill groundwater monitoring wells were installed or decommissioned during 2021.

5.0 STATISTICAL ANALYSIS RESULTS SUMMARY

The methods used to statistically analyze the Detection and Assessment Monitoring groundwater data, the rationale for the analytical methods, and the results of the 2021 statistical analysis are presented in Appendix B.

The 2021 groundwater sampling results suggest that the following EPA CCR Rule Appendix III constituents are present at concentrations estimated statistically as being significantly higher than background:

- ▼ Boron within monitoring wells SC-11, SC-12, SC-13, and SC-14
- ▼ Fluoride within monitoring well SC-12

EPA CCR Rule Appendix IV constituent selenium was measured in downgradient well SC-10 at a statistically significant level exceeding the Groundwater Protection Standards (GWPS) during the second semi-annual sampling event. Utilities is responding to this finding in accordance with §257.95(g) of EPA's CCR Rule.

6.0 GROUNDWATER PROTECTION STANDARDS (GWPS)

GWPS were established in accordance with §257.95(d)(2) of the EPA CCR Rule. The Rule states in §257.95(h) that the GWPS shall be:

- (1) *For constituents for which a maximum contaminant level (MCL) has been established under §141.62 and §141.66 of this title, the MCL for that constituent;*
- (2) *For the following constituents:*
 - (i) *Cobalt 6 micrograms per liter (ug/l);*
 - (ii) *Lead 15 ug/l;*
 - (iii) *Lithium 40 ug/l;*
 - (iv) *Molybdenum 100 ug/l.*
- (3) *For constituents for which the background level is higher than the levels identified under paragraphs (h)(1) and (h)(2) of this section, the background concentration.*

To create the GWPS, an upper tolerance limit (UTL) was calculated for each of the EPA CCR Rule Appendix IV constituents to establish their background concentration. Each UTL was then compared to the corresponding MCL or EPA CCR Rule standard. If a UTL was greater than the MCL or standard, then the UTL was used as the GWPS.

GWPS were calculated for the 2021 semi-annual sampling events and are provided in the statistical analysis report provided in Appendix B. A summary of the GWPS resulting from the 2021 sampling are presented in the table below:

GROUNDWATER PROTECTION STANDARDS

Appendix IV Constituent	MCL (mg/l)	EPA CCR Rule Standard (mg/l)	Background Higher than MCL or Standard *	Upper Tolerance Limit (mg/l)	GWPS (mg/l)
Antimony	0.006	-	No	0.0016	0.006
Arsenic	0.01	-	Yes	0.0127	0.0127
Barium	2	-	No	0.0518	2
Beryllium	0.004	-	No	0.002	0.004
Cadmium	0.005	-	No	0.005	0.005
Chromium	0.1	-	No	0.00712	0.1
Cobalt	-	0.006	Yes	0.0139	0.0139
Fluoride	4	-	No	0.85	4
Lead	-	0.015	No	0.0089	0.015
Lithium	-	0.040	Yes	1.13	1.13
Mercury	0.002	-	No	0.00002	0.002
Molybdenum	-	0.100	No	0.0161	0.100
Selenium	0.05	-	Yes	0.199	0.199
Thallium	0.002	-	No	0.002	0.002
Radium 226 and 228 Combined	5 pCi/l	-	Yes	6.7 pCi/l	6.7 pCi/l

* Upper tolerance limit calculated for the constituents and compared to the MCL or the EPA CCR Rule standard. If the UTL was greater than the MCL or standard, then the UTL was used as the GWPS.

Once GWPS have been calculated, §257.95(g)(3) requires that the owner / operator determine if any of the Appendix IV constituents are present at a statistically significant level exceeding the GWPS. To determine such, a confidence interval was calculated for each constituent and compared to the GWPS. The confidence interval calculations for 2021 are provided in Appendix B. The confidence interval calculations indicate that selenium was measured in downgradient well SC-10 at a statistically significant level exceeding the GWPS during the second semi-annual sampling event.

7.0 SUMMARY OF FINDINGS

Comparison of the groundwater flow to those historically measured shows de minimis differences in the groundwater flow regime beneath the site. Groundwater associated with the CCR Landfill continues to flow to the southeast towards the Retention Dam, which inhibits its migration off-site.

Statistical analysis suggests that boron concentrations at compliance groundwater monitoring wells SC-11, SC-12, SC-13, and SC-14 and fluoride concentrations at compliance groundwater monitoring well SC-12 exhibit a statistically significant increase over background concentrations; therefore, the CCR Landfill will continue with Assessment Monitoring.

EPA CCR Rule Appendix IV constituent selenium was measured in downgradient well SC-10 at a statistically significant level exceeding the GWPS during the second semi-annual sampling event. Utilities is responding to this finding in accordance with §257.95(g) of EPA's CCR Rule. As this statistically significant level exceedance determination was made in 2022, based on 2021 laboratory data, reporting requirements in accordance with §257.90(e)(6)(iv) of the CCR Rule will be included in the 2022 annual groundwater monitoring and corrective action report, as applicable.

The overall CCR Landfill groundwater monitoring program was reviewed. No notable problems were encountered during 2021. In consideration of the complex geology and other constraints, Utilities believes that the current Professional Engineer-certified and CDPHE-approved Coal Combustion Residuals Landfill Groundwater Detection Monitoring Plan continues to be appropriate for the site and compliant with the EPA CCR Rule.

7.1 **Risk**

Utilities believes that the risk posed by the CCR Landfill to human health and the environment via the groundwater exposure pathway continues to be low for the following reasons:

- ▼ Groundwater underlying the CSR CD Area (which includes the CCR Landfill) is not used for domestic or agricultural purposes. There are no drinking water or agricultural wells within the CD Area and is no reasonable potential for future domestic or agricultural uses of groundwater within this area, as it is owned and controlled by Utilities.
- ▼ Previously evaluated groundwater quality data indicates that groundwater upgradient of and underlying the CSR CD Area, in which the CCR Landfill is located, has a total dissolved solids (TDS) concentration exceeding 10,000 mg/l. The EPA, in their Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy, classifies groundwater with TDS concentrations greater than or equal to 10,000 mg/l as Class III water (EPA 1988). Class III is defined as "groundwater not a potential source of drinking water and/or limited beneficial use." The high TDS of groundwater upgradient of and beneath the CD Area discourages its use for domestic or agricultural purposes.
- ▼ The CSR Retention Dam inhibits the off-site migration of stormwater and groundwater associated with the CCR Landfill; therefore, limiting the potential for exposure. The Retention Dam largely hydrologically disconnects the CCR Landfill associated groundwater from the downgradient Fountain Creek Alluvial Aquifer (i.e. the closest drinking water source).

7.2 **Activities for 2022**

For 2022, Utilities plans to continue with Detection Monitoring and Assessment Monitoring. Utilities will also respond to the statistically significant finding regarding selenium in well SC-10 in accordance with §257.95(g) of EPA's CCR Rule.

8.0 REFERENCES

AECOM Technical Services. 2017. Coal Combustion Residuals (CCR) Ash Monofill Groundwater Detection Monitoring Plan Clear Spring Ranch, El Paso County, Colorado Revision 0. October 2017.

CDPHE. 2017. E-Mail from Jill Parisi / CDPHE to Patti Zietlow / Colorado Springs Utilities Re: Clear Spring Ranch CCR Landfill Groundwater Detection Monitoring Plan. November 14, 2017.

Haley & Aldrich. 1994. Hannah Ranch Dam Seepage Analysis Preliminary Engineering Report. April 1994.

Haley & Aldrich. 1995. Hanna Ranch Supernatant Dam Design Summary Report. February 1995.

Layne Western. 1977. Ash Disposal Site, R.D. Nixon Power Plant. Carl Nuzman, Bruce Maxwell & Carl Larson. August 1977.

Title 40 of the Code of Federal Regulations (CFR) Part 257 Subpart D.

U.S. EPA. 1988. Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy. Office of Groundwater Protection. June 1988.



Report Distribution List:

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- ▼ Ian Gavin / Colorado Springs Utilities - Nixon Power Plant
- ▼ Utilities CCR Landfill Website

APPENDIX A

Vicinity Map and Groundwater Elevation Contours



Colorado Springs Utilities

It's how we're all connected

Environmental Services
121 South Tejon Street, Fourth Floor
Colorado Springs, Colorado 80903

Orientation:



Legend:

-  Fountain Creek
-  Boundary - Certificate of Designation CD-04-001
-  Boundary - Clear Spring Ranch

VICINITY MAP

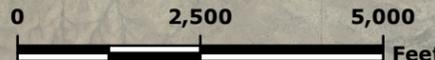
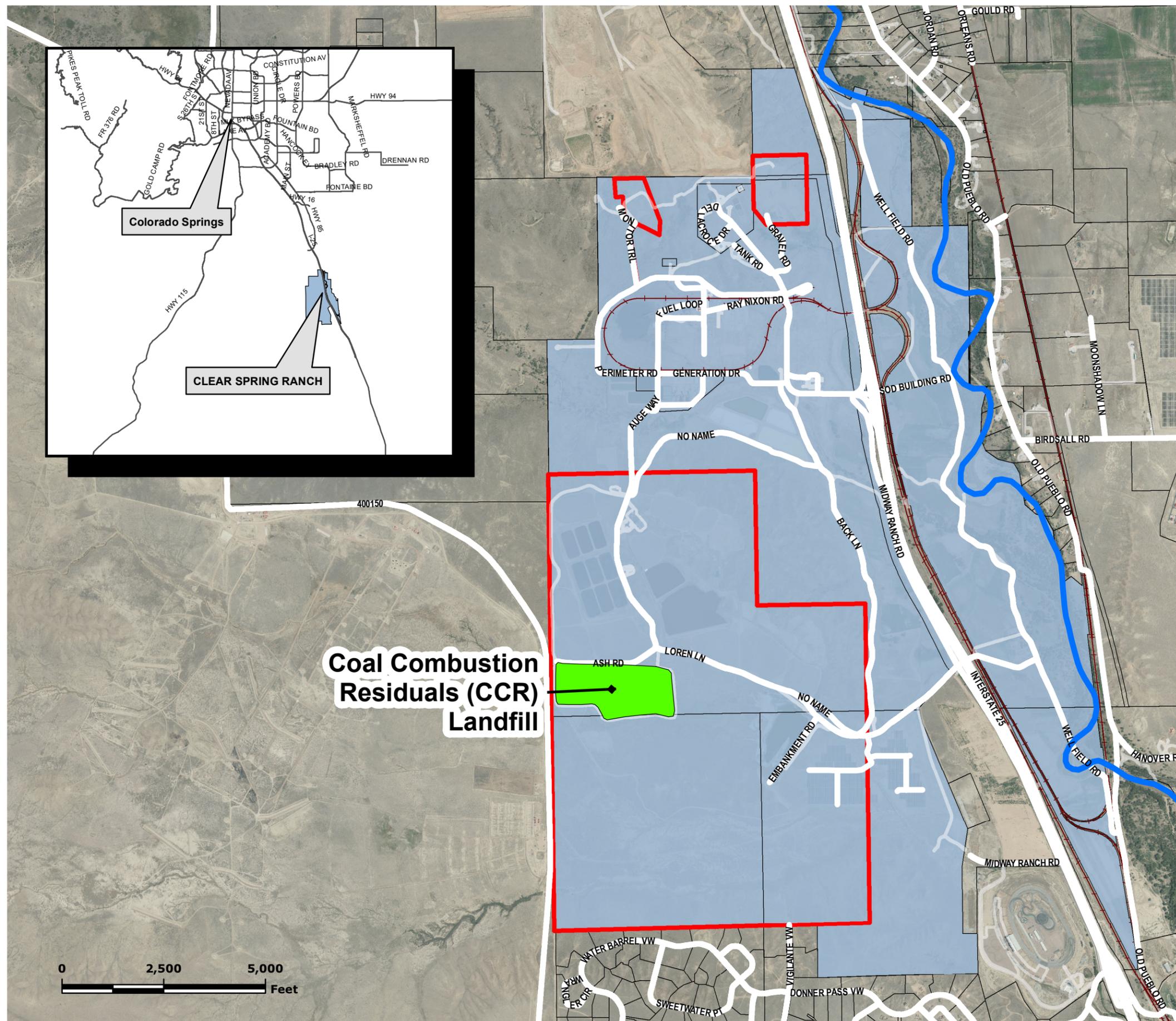
Clear Spring Ranch
Coal Combustion Residuals Landfill
El Paso County

Project No: 550-504-7

Prepared By: Environmental Services

Date: January 31, 2022

**Figure
Number**
1

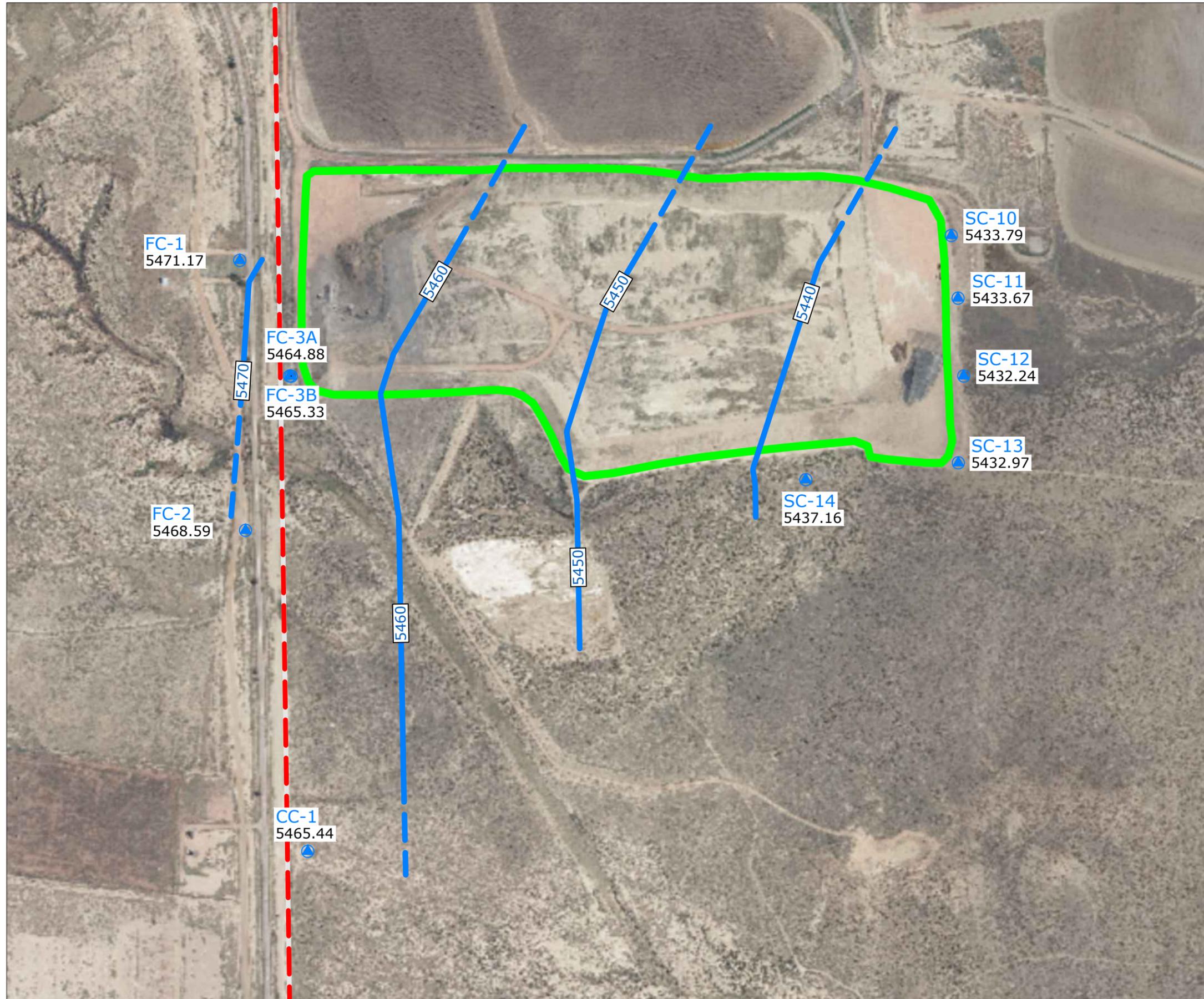




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Colorado Springs, Colorado 80903



Orientation:



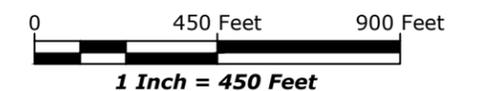
Legend:

- Coal Combustion Residuals (CCR) Landfill
- Boundary - Clear Spring Ranch Property
- Boundary - Certificate of Designation
- Groundwater Potentiometric Surface (Dashed portions are estimated)
- Groundwater Elevation - Feet (Above mean sea level)
- Groundwater Monitoring Well Location

Notes:

* Groundwater Elevation Measurements Collected September 29, 2021.

Scale:



GROUNDWATER ELEVATION CONTOURS - 2021

Clear Spring Ranch
Coal Combustion Residuals Landfill
El Paso County

Project No: 550-504-7

Prepared By: Environmental Services

Date: January 31, 2022

Figure
Number
2

APPENDIX B

Statistical Analysis Report

Statistical Analysis Report for CSU Clear Spring Ranch
2021 CCR Program, Annual Update, Ash Landfill Network

Kirk Cameron, Ph.D., MacStat Consulting, Ltd.

2022-01-25

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1 Introduction

This report summarizes the statistical analysis performed on groundwater quality constituents monitored during 2021 of the Coal Combustion Residuals (CCR) Rule’s groundwater monitoring program at the Colorado Springs Utilities (CSU) Clear Spring Ranch Ash Landfill (CSR).

The Clear Spring Ranch Ash Landfill CCR unit is currently in Assessment Monitoring, necessitating monitoring of both the Appendix III and IV constituents listed in **Table 2**. As part of this year’s efforts (i.e., 2021), the baseline data sets collected since the first year of the CCR-Rule Program were evaluated in order to establish updated groundwater protection standards (GWPS) on upgradient background data representing Appendix IV constituents, and then to compare 2021 compliance measurements against these statistical limits to assess any statistically significant increases (SSI) above the GWPS. The analysis also established updated prediction limits on upgradient background data for Appendix III constituents, and compared 2021 compliance measurements against these statistical limits to assess any SSIs above background. Summaries of all the statistical test results are provided in subsequent sections of this report.

At the Clear Spring Ranch Ash Landfill network, the sampling results used to compute the background statistics and to identify potential SSIs were obtained from a set of designated background wells (CC-1, FC-1, FC-2, FC-3A, FC-3B) using data collected from June 2015 until November 2021.

Groundwater samples were analyzed for 21 distinct constituents as required under Appendix III and Appendix IV of the CCR Rule (listed in **Table 2**). Only non-filtered sample results were utilized for the statistical analysis. As required by the USEPA’s Coal Combustion Residuals (CCR) Rule section describing the Assessment Monitoring Program (§257.95), test results for the 2021 Appendix IV Assessment Monitoring events were compared to the GWPS for determination of any exceedances. Also, test results for the Appendix III parameters were compared against the updated background prediction limits.

Included in this report are ‘Traffic Light’ matrices to facilitate an at-a-glance identification of any statistically significant exceedances and to promote intra-company follow-up assessments of the possible causes and to plan for mitigation actions, whenever warranted. Sample analytical results of CCR-Rule Appendix III and Appendix IV constituents obtained from each of the monitoring wells and events were used to perform the statistical analysis and generate the graphs shown in this report. The current CCR Rule groundwater monitoring network, as Certified by a Professional Engineer, is presented in **Table 1**.

The ‘R’ Statistical Analysis package (www.r-project.org) in conjunction with R-Studio (www.rstudio.com), both popular public domain software products, were used in the production of the statistical values and graphs. Data dumps from CSU’s Database were used to populate the R-based statistical analyses.

Table 1: CCR Rule Monitoring Network

Background	Downgradient
CC-1	SC-10
FC-1	SC-11
FC-2	SC-12
FC-3A	SC-13
FC-3B	SC-14

For this year’s efforts, the baseline datasets of the CCR-Rule groundwater monitoring program were

augmented with routine monitoring samples in order to update the background data set. The background data were then utilized to develop both updated prediction limits and statistically-derived GWPS in those cases where site-specific background levels naturally exceed published regulatory limits. Finally, data from the compliance wells were statistically compared either to prediction limits for Appendix III parameters or to the GWPS for Appendix IV parameters to determine whether any statistical limits or standards were exceeded.

At the Clear Spring Ranch Ash Landfill CCR network, the sampling results used to compute the background statistics were obtained only from designated background wells using historical data that were first screened for possible trends or shifts in concentration levels over time. Any early data exhibiting a substantially different pattern or average concentration level than more recent data were excluded from the calculations. The cutoff date used for selecting background data was determined on a constituent by constituent basis, but was designed to include as much data as possible reflecting current groundwater conditions. For this year's analysis, no significant background trends or changes were identified except for Thallium prior to mid-2017. For the remaining parameters, all the background data were included in the statistical calculations.

Groundwater samples were analyzed for a total of 21 distinct constituents, as required for the CCR monitoring program. Fluoride is monitored under both Appendices. Summary statistics of all the Appendix III and IV compliance well data collected in 2021 are presented in **Appendix A**. Descriptive graphical summaries of all the data are presented in **Appendix B**. Time series plots of each well-constituent pair display the individual measurement results, while side-by-side boxplots, colored by gradient, allow visual comparisons between upgradient or background wells versus downgradient locations, relative to an overlaid regulatory limit (REGLIM) – either the CCR Rule Standard or the MCL – when applicable.

USEPA's Unified Guidance document on the statistical analysis of groundwater monitoring data (USEPA 2009) discusses recommended strategies for statistical evaluations during Detection and Assessment Monitoring. Of note, it is a 'best-practice' when using prediction limits to always implement some form of retesting, in order to avoid potential false positive results and to confirm real changes in groundwater quality. Under this framework, a statistically significant increase (SSI) is identified only when both the routine observation and any resamples exceed the prediction limit.

In Assessment Monitoring, confidence-interval (CI) bands are a recommended technique for performing statistical comparisons to GWPS. In particular, trends at downgradient wells in analytical concentrations of required parameters can be plotted and used to estimate CI bands, which in turn can be compared against their respective GWPS. A statistically significant increase (SSI) is found if and only if the lower limit of the CI band exceeds the GWPS for the most recent Assessment Monitoring sampling event.

2 Statistical Analysis Approach: Appendix III Parameters

CSU has established a statistical testing approach within its CCR detection monitoring program using the following decision logic:

1. For each Appendix III parameter and compliance well location, a comparison is made between each routinely collected sample and a site-specific upper prediction limit (UPL) computed from upgradient background data (or for pH, against a site-specific prediction interval).
2. If the routine observation exceeds the upper prediction limit (or for pH, is lower than the lower prediction limit), a potential SSI is identified. If the routine observation is within the bounds of the UPL or prediction interval, the test passes.

Table 2: CCR Rule Monitored Constituents

Appendix III	Appendix IV
Boron	Antimony
Calcium	Arsenic
Chloride	Barium
Fluoride	Beryllium
Sulfate	Cadmium
pH	Chromium
TDS	Cobalt
	Fluoride
	Lead
	Lithium
	Mercury
	Molybdenum
	Rad226+228
	Selenium
	Thallium

3. In the event of a potential SSI, one resample is compared against the UPL or prediction interval. If the resample falls within the bounds of prediction limit/interval, the test passes. If instead the resample exceeds the bounds of the limit/interval, an SSI is confirmed for that well and constituent.

2.1 Background Statistical Models and Prediction Limits

Beginning with this year’s annual report, certain technical improvements were implemented when computing each prediction limit (UPL) or prediction interval, leading to the following steps:

1. All baseline data from designated upgradient or background wells collected through November 2021 were grouped and initially screened for possible outliers. This outlier screening was performed visually on time series plots of the data, as well as systematically via a modified version of Tukey’s boxplot rule.

Unlike previous analyses, however, apparent outliers were not formally tested or removed from the data analysis. Instead, as described in Step 2 below, any possible outliers were *down-weighted* in the statistical calculations, in order to minimize the impact of such values on the UPL estimates.

In case of a nonparametric model, any potential outliers that were flagged were visually compared against observations at other well locations. If similar patterns or measurement ranges were seen, the suspect values were kept in the data. If not, the suspected outliers were excluded from the prediction limit computations. At the Clear Spring Ranch Ash Landfill CCR network, 2 possible nonparametric outliers were flagged in the grouped background data.

Any confirmed nonparametric background outliers are listed in **Table 3** below. These values were excluded from the UPL calculations, but *are* shown on the time series plots for the sake of completeness and transparency.

Table 3: Confirmed and Excluded NonParametric Background Outliers

COC	Well	Date	Result	NonDetect Flag	Outlier
Antimony	CC-1	2018-02-14	0.008	1	TRUE
Antimony	FC-1	2018-02-14	0.008	1	TRUE

This new strategy for handling outliers entails certain benefits, especially since the process of flagging outliers always involves a mixture of art (i.e., professional judgment) and statistical science. In some cases, disputes can arise among stakeholders as to whether specific values ought to be treated as outliers and/or eliminated from statistical analysis. This can especially be true when there is no known physical cause of the apparent outliers (e.g., laboratory or sampling error). Down-weighting done in an objective manner does not exclude any data, yet minimizes the impact of true outliers.

At the Clear Spring Ranch Ash Landfill CCR network, 2 parametric outliers were flagged in the grouped background data.

Any parametric background outliers are listed in **Table 4** below. These values were down-weighted using the values shown in the Weight column. Note that non-outliers generally have weights equal to 1.

Table 4: Down-Weighted Parametric Background Outliers

COC	Well	Date	Result	NonDetect Flag	Weight	Outlier
Barium	CC-1	2016-06-22	5.66	0	0.00268	TRUE
Molybdenum	FC-3B	2021-09-30	0.78	0	0.00045	TRUE

2. The grouped baseline data were analyzed to determine whether they could be fit to a known statistical model. If so, a quasi-parametric t-bootstrap prediction limit/interval was computed; if not, a nonparametric prediction limit/interval was constructed. Datasets which could not be sufficiently normalized were therefore analyzed by nonparametric means. In the nonparametric case, any apparent outliers were carefully reviewed to determine if they should be removed from the analysis. Unfortunately, formal outlier testing is not possible when the underlying data model is unknown. Outlier removal in this setting comes down to professional judgment and statistical experience.

To account for possible outliers in those datasets that were fit to a known statistical model (i.e., parametric cases), a probability plot of the background dataset was constructed matching the observed data values against quantiles from a standard normal distribution (i.e., z-scores). Then a *robust* regression line was fit to the probability plot, to capture the dominant pattern in the bulk of the data while minimizing the impact (or influence) on the estimated line of any extreme or outlying values. Using this robust regression line, the distance between each observed value and the regression line fit was calculated and used to generate a statistical weighting of each data point. Values farther off the line were assigned smaller weights via a standard weighting function, while those closest to the line received the highest weights. These weights (w_i) were subsequently used in computing each prediction limit/interval.

To account for non-normal data, a range of possible mathematical transformations was applied to each background dataset, in order to identify the statistical model that maximized the robust

correlation between pairs on the probability plot. The statistical weights described above were ultimately computed using the best-fitting statistical model.

3. The best-fitting statistical model for each COC was used to compute a prediction limit or interval.

When a parametric model is appropriate, on the normalized scale, a prediction interval is computed using the standard normal theory equation:

$$PL = \bar{x} \pm \kappa s$$

where \bar{x} and s represent the mean and standard deviation of the (transformed) observations, and κ is a prediction limit multiplier. If the data have been transformed, the final prediction limit/interval is derived by back-transforming the scaled limit/interval. The prediction limit multiplier is computed as function of several inputs, including the background sample size, the targeted site-wide false positive risk (SWFPR), the configuration of the monitoring network (i.e., number of wells and number of COIs per well), and the retesting strategy implemented at the site (e.g., 1-of-2, etc.).

To account for possible outliers and the statistical weighting described above, a slightly different strategy was implemented to compute an estimate of the prediction limit multiplier, $\hat{\kappa}$. Specifically, a large number of *bootstrap* samples were drawn from the observed data (each bootstrap sample representing a random resampling of the original data, with each sample element being selected at random *with replacement*). For each bootstrap sample, robust alternatives to the mean and standard deviation were computed (i.e., the median and a scale estimate labeled S_n respectively) to form the following weighted ratio:

$$w_i \left(\frac{x_i - \tilde{x}}{S_n} \right)$$

where x_i is a random value drawn from the background data and w_i is the statistical weight associated with that data point. Ultimately, a weighted upper percentile of these ratios led to an estimate of the appropriate prediction limit multiplier, $\hat{\kappa}$. Then the t-bootstrap prediction interval was computed as:

$$PL = \tilde{x} \pm \hat{\kappa} S_n$$

The PLs computed under this methodology utilize all the data, including any possible extreme values, are reasonably robust (i.e., minimally impacted) in the presence of actual outliers, but are *quasi-parametric* — instead of nonparametric — despite the use of the bootstrap technique. This last characteristic implies that the t-bootstrap will result in an accurate PL only when the bulk of the background data can be closely fit to a known statistical model. In cases where an adequate statistical model cannot be identified, a nonparametric PL must be computed instead.

The probability plot correlations mentioned earlier were utilized in testing this method on a large series of datasets to derive an empirical cutoff value of 0.95 for deciding when the t-bootstrap could be applied. Further, the t-bootstrap does not work very well when the dataset is *multi-modal* (i.e., it has multiple peaks or ‘humps’), for instance when multiple background wells are grouped together but have much different average concentration levels (perhaps due to a heterogenous aquifer). If a test for unimodality (i.e., single peak like the normal distribution) passed, then correlations of 0.95 and above led to use of the t-bootstrap, while multi-modality or correlations below this cutoff led to

calculation of a nonparametric prediction limit/interval. Note that for nonparametric models, the prediction limit is selected as one of the largest of the sample values, often the maximum.

For the Clear Spring Ranch Ash Landfill CCR network, **Table 5** lists the calculated UPLs (and LPL for pH) established for this particular Unit.

Table 5: Clear Spring Ranch Ash Landfill Interwell Prediction Limits

COI	N	ND.Pct	Model	1-of-m	FPR	Units	LPL	UPL
Boron	214	0	TBOOT-Log	2	0.0149	mg/l	NA	1.32
Calcium	94	0	TBOOT-Fifth Power	2	0.0149	mg/l	NA	658
Chloride	203	0	NP	2	0.0133	mg/l	NA	1670
Fluoride	103	0	NP	2	0.0109	mg/l	NA	0.85
pH	167	0	NP	2	0.0140	SU	6.8	7.7
Sulfate	192	0	NP	2	0.0148	mg/l	NA	19500
TDS	205	0	NP	2	0.0130	mg/l	NA	33900

2.2 Comparing Compliance Data Against Prediction Limits

To assess whether any SSIs occurred during 2021 Detection Monitoring at the Clear Spring Ranch Ash Landfill CCR site, the first routine sampling event from each parameter-well pair was compared against its respective prediction limit. Under a 1-of-2 retesting strategy, the next consecutive sampling round was reserved as a possible resample. This enabled sufficient lag time between any of the routine and resample measurements to assume approximate statistical independence.

If the routine observation exceeded the upper prediction limit (UPL), or for pH, was outside the bounds of the prediction interval on either side, a potential SSI was flagged. Then the reserved resample associated with the routine event was compared against the same limit or interval. Only if the routine observation and its associated resample both were outside the bounds of the prediction limit/interval was a confirmed SSI identified.

Table 6 is a summary of 2021 statistical tests at the Clear Spring Ranch Ash Landfill CCR unit where a confirmed SSI occurred. Plots of the 2021 sampling data overlaid with the constituent-specific prediction limits are shown in **Appendix C**. In these figures, any confirmed SSIs are shown by coloring the routine measurement exceedance in orange and the resample confirmatory exceedance in purple.

Table 6: Confirmed 2021 Prediction Limit SSIs at Clear Spring Ranch Ash Landfill CCR Site

COC	Well	Date	Result	Units	Stage	LPL	UPL	SSI
Boron	SC-11	2021-03-24	2.3	mg/l	Sample	NA	1.32	YES
Boron	SC-11	2021-09-29	2.29	mg/l	Resample	NA	1.32	YES
Boron	SC-12	2021-03-24	4.12	mg/l	Sample	NA	1.32	YES
Boron	SC-12	2021-09-29	3.92	mg/l	Resample	NA	1.32	YES
Boron	SC-13	2021-03-24	1.52	mg/l	Sample	NA	1.32	YES
Boron	SC-13	2021-09-29	1.5	mg/l	Resample	NA	1.32	YES
Boron	SC-14	2021-03-24	1.52	mg/l	Sample	NA	1.32	YES
Boron	SC-14	2021-09-29	1.46	mg/l	Resample	NA	1.32	YES
Fluoride	SC-12	2021-03-24	1.37	mg/l	Sample	NA	0.85	YES

Table 6: Confirmed 2021 Prediction Limit SSIs at Clear Spring Ranch
Ash Landfill CCR Site (*continued*)

COC	Well	Date	Result	Units	Stage	LPL	UPL	SSI
Fluoride	SC-12	2021-09-29	0.95	mg/l	Resample	NA	0.85	YES

2.3 Summary of Appendix III Statistical Analysis

To facilitate an ‘at-a-glance’ summary of the prediction limit statistical comparison results, **Table 7** is a ‘traffic light’ matrix, showing a compact representation of each well location matched against each constituent in Appendix III. This summary is useful in planning for mitigation actions. Green cells indicate that no SSI was observed in 2021. Red cells indicate the opposite: an SSI was flagged during 2021.

At the Clear Spring Ranch Ash Landfill CCR network, a total of 5 Appendix III SSIs were identified at Program network wells.

Table 7: Traffic Light Matrix for Clear Spring Ranch Ash Landfill CCR Site

COC	Well Locations				
	SC-10	SC-11	SC-12	SC-13	SC-14
Boron	GRN	RED	RED	RED	RED
Calcium	GRN	GRN	GRN	GRN	GRN
Chloride	GRN	GRN	GRN	GRN	GRN
Fluoride	GRN	GRN	RED	GRN	GRN
pH	GRN	GRN	GRN	GRN	GRN
Sulfate	GRN	GRN	GRN	GRN	GRN
TDS	GRN	GRN	GRN	GRN	GRN

Color-Coding Key:

RED = Results outside prediction limit bounds;

GRN = Results within prediction limit bounds;

YLW = Initial results outside bounds (potential SSI)

3 Statistical Analysis Approach: Appendix IV Parameters

The basic steps in the Assessment Monitoring analysis included the following:

1. Developing groundwater protection standards (GWPS) for each Appendix IV constituent, using published MCLs and/or water quality limits, along with baseline data from upgradient and background well locations at each CCR site;
2. Computing trends and associated confidence interval (CI) bands for each well location and Appendix IV constituent (i.e., for each well-constituent pair); and
3. Comparing each CI band against its respective GWPS to assess whether or not a statistically significant exceedance (SSI) occurred.

To accomplish these steps, the data were first summarized and modeled. To handle any non-detects in these calculations, non-detect values were treated as statistically ‘left-censored,’ with the censoring limit equal to the reporting limit (RL). Then the Kaplan-Meier adjustment method (USEPA 2009) was employed to derive estimated summary statistics that account for the presence of non-detects.

3.1 Developing Groundwater Protection Standards (GWPS)

USEPA has published maximum contaminant limits (MCL) or alternate regulatory limits for each of the Appendix IV constituents. Consequently, in most cases the Groundwater Protection Standard (GWPS) is equal to the MCL. However, there may be cases where background levels of a constituent exceed the MCL. In these instances, an alternate GWPS must be derived from on-site background levels.

CSU has established GWPS across its CCR program using the following decision logic:

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- For each Appendix IV parameter where a GWPS must be established, a comparison is made between the promulgated regulatory limit and a site-specific limit computed from background data.
 - If the background-based limit is larger than the promulgated limit, the GWPS is set to the background limit. If the promulgated limit is larger, the GWPS is set to the published value.

In cases where a background limit must be computed, USEPA’s Unified Guidance recommends different strategies for computing a background-based GWPS ((USEPA 2009), Section 7.5). One of these strategies — a 95% confidence, 95% coverage upper tolerance limit (UTL) on background — was selected and used to compute the UTL on site-specific background data for each Appendix IV parameter. Then these UTLs were compared against the promulgated regulatory limits to determine the site-specific GWPS.

3.2 Computing Groundwater Protection Standards (GWPS)

Each tolerance limit (UTL) was computed in the following manner, using the same technical improvements applied to computation of prediction limits for Appendix III parameters:

1. All baseline data from designated upgradient or background wells collected through November 2021 were grouped and initially screened for possible outliers. This outlier screening was performed visually on time series plots of the data, as well as systematically via a modified version of Tukey’s boxplot rule, as described in **Section 2.1**. Apparent outliers were not formally tested or removed from the data analysis, but instead were *down-weighted* in the statistical calculations, in order to minimize the impact of such values on the UTL estimates.

In case of a nonparametric model, any outliers that were flagged were visually compared against observations at other well locations. If similar patterns or measurement ranges were seen, the suspect values were kept in the data. If not, the suspected outliers were excluded from the tolerance limit computations.

2. The grouped baseline data were analyzed to determine whether they could be fit to a known statistical model. If so, a quasi-parametric t-bootstrap UTL was computed; if not, a non-parametric UTL was constructed. Datasets which could not be sufficiently normalized were therefore analyzed by nonparametric means.

To account for possible outliers in each dataset, a probability plot of the background dataset was constructed matching the observed data values against quantiles from a standard normal distribution (i.e., z-scores). Then a *robust* regression line was fit to the probability plot, to capture the dominant pattern in the bulk of the data while minimizing the impact (or influence) on the estimated line of any extreme or outlying values. Using this robust regression line, the distance between each observed value and the regression line fit was calculated and used to generate a statistical weighting of each data point. Values further off the line were assigned smaller weights via a standard weighting function, while those closest to the line received the highest weights. These weights (w_i) were subsequently used in computing each UTL.

To account for non-normal data, a range of possible mathematical transformations was applied to each background dataset, in order to identify the statistical model that maximized the robust correlation between pairs on the probability plot. The statistical weights described above were ultimately computed using the best-fitting statistical model.

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3. The best-fitting statistical model for each COI was used to compute an upper tolerance limit (UTL) with 95% coverage and 95% confidence.

When a parametric model is appropriate, on the normalized scale, a UTL is computed using the standard normal theory equation:

$$UTL = \bar{x} + \kappa s$$

where \bar{x} and s represent the mean and standard deviation of the (transformed) observations, and κ is a tolerance limit multiplier. If the data have been transformed, the final UTL is derived by back-transforming the scaled UTL. The tolerance limit multiplier (or *tolerance factor*) is drawn from a standard table of such values.

To account for possible outliers and the statistical weighting described above, a slightly different strategy was implemented to compute an estimate of the tolerance factor, $\hat{\kappa}$. Specifically, a large number of *bootstrap* samples were drawn from the observed data (each bootstrap sample representing a random resampling of the original data, with each sample element being selected at random *with replacement*). For each bootstrap sample, robust alternatives to the mean and standard deviation were computed (i.e., the median and a scale estimate labeled S_n respectively) to form the following weighted ratio:

$$w_i \left(\frac{x_i - \tilde{x}}{S_n} \right)$$

where x_i is a random value drawn from the background data and w_i is the statistical weight associated with that data point. Ultimately, a weighted upper percentile of these ratios led to an estimate of the appropriate tolerance factor, $\hat{\kappa}$. Then the t-bootstrap upper tolerance limit was computed as:

$$UTL = \tilde{x} + \hat{\kappa} S_n$$

The UTLs computed under this methodology utilize all the data, including any possible extreme values, are reasonably robust (i.e., minimally impacted) in the presence of actual outliers, but are *quasi-parametric* — instead of nonparametric — despite the use of the bootstrap technique. This last characteristic implies that the t-bootstrap will result in an accurate UTL only when the bulk of the background data can be closely fit to a known statistical model. In cases where an adequate statistical model cannot be identified, a nonparametric UTL must be computed instead.

The probability plot correlations mentioned earlier were utilized in testing this method on a large series of datasets to derive an empirical cutoff value of 0.94 for deciding when the t-bootstrap could be applied. Correlations of 0.94 and above led to use of the t-bootstrap, while correlations below this cutoff led to calculation of a nonparametric UTL. Note that for nonparametric models, the UTL is selected as one of the largest of the sample values, often the maximum.

For the Clear Spring Ranch Ash Landfill CCR unit, **Table 8** lists the calculated GWPS limits established for this monitoring network.

3.3 Computing Trend Lines and Confidence Interval Bands

USEPA's *Unified Guidance* recommends comparing some type of confidence interval (CI) against a groundwater protection standard (GWPS) in order to assess whether or not the limit has been

Table 8: 2021 Clear Spring Ranch Ash Landfill CCR Unit GWPS Limits

COI	Model	N	Coverage	Confidence	UTL	RegLimit	GWPS
Antimony	NP	92	0.95	0.991	0.0016	0.006	0.006
Arsenic	TBOOT-Eighth Root	108	0.95	0.95	0.0127	0.01	0.0127
Barium	TBOOT-Log	108	0.95	0.95	0.0518	2	2
Beryllium	NP	93	0.95	0.95	0.002	0.004	0.004
Cadmium	NP	92	0.95	0.991	0.005	0.005	0.005
Chromium	TBOOT-Normal	98	0.95	0.95	0.00712	0.1	0.1
Cobalt	NP	90	0.95	0.99	0.0139	0.006	0.0139
Fluoride	NP	103	0.95	0.967	0.85	4	4
Lead	NP	97	0.95	0.958	0.0089	0.015	0.015
Lithium	NP	108	0.95	0.974	1.13	0.04	1.13
Mercury	NP	95	0.95	0.954	0.00002	0.002	0.002
Molybdenum	TBOOT-Sixth Root	98	0.95	0.95	0.0161	0.1	0.1
Rad226+228	TBOOT-Eighth Root	90	0.95	0.95	6.7	5	6.7
Selenium	NP	107	0.95	0.973	0.199	0.05	0.199
Thallium	NP	46	0.95	0.906	0.002	0.002	0.002

exceeded with statistical significance. If the entire interval exceeds the GWPS, a statistically significant increase (SSI) is identified. If none of the interval, or only part, exceeds the GWPS, no SSI is recorded.

Since groundwater data are collected over time, and not all at once, some or most of the variation in the measurements may be due to a trend. To better account for this possibility, USEPA also recommends a variation on the confidence interval method known as a confidence interval band around a trend line. In this case, a (linear) trend line is first fit to the data, then a confidence band is constructed around the trend line. The confidence interval band can be compared against a GWPS in much the same fashion as a confidence interval, only now a comparison can be made at different points in time by comparing the ‘cross-section’ of the band for a given sampling date. If the interval represented by the confidence band cross-section fully exceeds the GWPS, an SSI is identified for that sampling event.

At the CSU CCR site, CI bands were constructed for each well-constituent pair using all available non-outlier sample data. Cross-sections of each band were then compared to the GWPS for the most recent Assessment Monitoring event for the purpose of identifying any SSIs.

3.3.1 Trend Lines Using Linear Regression

Unless there are extreme outliers and/or curvature in the data, linear regression provides a standard and well-tested method for estimating the linear portion of a trend. The slope of the regression line points to the magnitude and direction of the trend. There is also a standard method for computing a confidence band around a linear regression trend line. For instance, equations [21.24] and [21.25] of Section 21.3 in the *Unified Guidance* can be compactly written as

$$CB_{1-\alpha} = \hat{x}_0 \pm \sqrt{2s_e^2 F_{1-\alpha, n-2} \left[\frac{1}{n} + \frac{(t_0 - \bar{t})^2}{(n-1)s_t^2} \right]}$$

where CB = confidence band, \hat{x}_0 is the regression line estimate at time t_0 , s_e^2 is the mean squared error of the regression line, F is a quantile from the F -distribution with 2 and $n - 2$ degrees of freedom, and \bar{t} and s_t^2 represent the mean and standard deviation of the sampling dates.

For well-constituent pairs with no non-detects, linear regression and the formula above were used to construct each confidence band with 98% overall confidence, corresponding to a lower confidence limit with 99% confidence.

3.4 Comparing Confidence Interval Bands Against GWPS

To assess whether any SSIs have occurred during the 2021 Assessment Monitoring at the CSU CCR site, the confidence interval (CI) bands described in **Section 2.2** were compared against the constituent-specific groundwater protection standards (GWPS) described in **Section 2.1**. Of note, an SSI was identified if and only if the CI band fully exceeded the GWPS at the most recent sampling event.

Plots of the CI band comparisons for each well-constituent pair are presented in **Appendix C**.

3.5 Summary of Appendix IV Statistical Analysis

To facilitate an ‘at-a-glance’ summary of the statistical comparison results, **Table 9** is a ‘traffic light’ matrix, showing a compact representation of each well location matched against each constituent in Appendix IV. This summary is useful in planning for mitigation actions. Green cells indicate that no SSI was observed. Red cells indicate the opposite: an SSI was flagged at the most recent sampling event. Yellow cells are warnings which indicate that a well-constituent pair should be closely watched. These cases have increasing trends and a CI band whose lower limit is at least 65% of the GWPS. Often, in yellow cells, the CI band cross-section straddles the GWPS.

At the Clear Spring Ranch Ash Landfill CCR unit, a total of 1 SSI(s) were identified during the 2021 annual Assessment Monitoring analysis.

Table 9: Traffic Light Matrix for Clear Spring Ranch Ash Landfill CCR Unit

COC	Well Locations				
	SC-10	SC-11	SC-12	SC-13	SC-14
Antimony	GRN	GRN	GRN	GRN	GRN
Arsenic	GRN	GRN	GRN	GRN	GRN
Barium	GRN	GRN	GRN	GRN	GRN
Beryllium	GRN	GRN	GRN	GRN	GRN
Cadmium	GRN	GRN	GRN	GRN	GRN
Chromium	GRN	GRN	GRN	GRN	GRN
Cobalt	GRN	GRN	GRN	GRN	GRN
Fluoride	GRN	GRN	GRN	GRN	GRN
Lead	GRN	GRN	GRN	GRN	GRN
Lithium	GRN	GRN	GRN	GRN	GRN
Mercury	GRN	GRN	GRN	GRN	GRN
Molybdenum	GRN	GRN	GRN	GRN	GRN
Rad226+228	GRN	GRN	GRN	GRN	GRN
Selenium	RED	YLW	GRN	GRN	GRN
Thallium	GRN	GRN	GRN	GRN	GRN

Color-Coding Key:

RED = CI Band above GWPS;

GRN = CI Band below GWPS;

YLW = Non-Decr Trend, CI Lower Bound at least 65% of GWPS

4 References

USEPA. 2009. "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance." USEPA: Office of Resource Conservation & Recovery, EPA 530-R-09-007.

Appendix A: 2021 Compliance Well Summary Statistics

Table 10: 2021 Summary Statistics for CCR Parameters at Well SC-10

Well	COC	Units	N	NDs	Min.Date	Max.Date	Minimum	Maximum	Mean	Median
SC-10	Antimony	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-10	Arsenic	mg/l	2	0	2021-03-24	2021-09-29	0.011	0.0118	0.0114	0.0114
SC-10	Barium	mg/l	2	0	2021-03-24	2021-09-29	0.0111	0.0116	0.0113	0.0113
SC-10	Beryllium	mg/l	2	2	2021-03-24	2021-09-29	2e-04	2e-04	1e-04	2e-04
SC-10	Boron	mg/l	2	0	2021-03-24	2021-09-29	1.13	1.19	1.16	1.16
SC-10	Cadmium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-10	Calcium	mg/l	2	0	2021-03-24	2021-09-29	387	425	406	406
SC-10	Chloride	mg/l	2	0	2021-03-24	2021-09-29	1010	1020	1015	1015
SC-10	Chromium	mg/l	2	1	2021-03-24	2021-09-29	0.001	0.001	0.001	0.001
SC-10	Cobalt	mg/l	2	2	2021-03-24	2021-09-29	0.005	0.005	0.0025	0.005
SC-10	Fluoride	mg/l	2	0	2021-03-24	2021-09-29	0.55	0.84	0.695	0.695
SC-10	Lead	mg/l	2	0	2021-03-24	2021-09-29	0.00063	8e-04	7e-04	0.000715
SC-10	Lithium	mg/l	2	0	2021-03-24	2021-09-29	0.657	0.708	0.682	0.682
SC-10	Mercury	mg/l	2	0	2021-03-24	2021-09-29	6e-06	7e-06	0	6.5e-06
SC-10	Molybdenum	mg/l	2	0	2021-03-24	2021-09-29	0.0038	0.0052	0.0045	0.0045
SC-10	pH	SU	2	0	2021-03-24	2021-09-29	7.5	7.7	7.6	7.6
SC-10	Rad226+228	pCi/L	2	0	2021-03-24	2021-09-29	0.352	1.34	0.848	0.848
SC-10	Selenium	mg/l	2	0	2021-03-24	2021-09-29	0.218	0.256	0.237	0.237
SC-10	Sulfate	mg/l	2	0	2021-03-24	2021-09-29	9700	9870	9785	9785
SC-10	TDS	mg/l	2	0	2021-03-24	2021-09-29	17000	17300	17150	17150
SC-10	Thallium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04

Table 11: 2021 Summary Statistics for CCR Parameters at Well SC-11

Well	COC	Units	N	NDs	Min.Date	Max.Date	Minimum	Maximum	Mean	Median
SC-11	Antimony	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-11	Arsenic	mg/l	2	0	2021-03-24	2021-09-29	0.0111	0.0115	0.0113	0.0113
SC-11	Barium	mg/l	2	0	2021-03-24	2021-09-29	0.0064	0.0121	0.0092	0.00925
SC-11	Beryllium	mg/l	2	2	2021-03-24	2021-09-29	2e-04	2e-04	1e-04	2e-04
SC-11	Boron	mg/l	2	0	2021-03-24	2021-09-29	2.29	2.3	2.29	2.29
SC-11	Cadmium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-11	Calcium	mg/l	2	0	2021-03-24	2021-09-29	411	430	420	420
SC-11	Chloride	mg/l	2	0	2021-03-24	2021-09-29	1100	1130	1115	1115
SC-11	Chromium	mg/l	2	1	2021-03-24	2021-09-29	0.001	0.0017	0.0013	0.001
SC-11	Cobalt	mg/l	2	2	2021-03-24	2021-09-29	0.005	0.005	0.0025	0.005
SC-11	Fluoride	mg/l	2	0	2021-03-24	2021-09-29	0.58	0.8	0.69	0.69
SC-11	Lead	mg/l	2	1	2021-03-24	2021-09-29	5e-04	0.00065	6e-04	5e-04
SC-11	Lithium	mg/l	2	0	2021-03-24	2021-09-29	0.551	0.607	0.579	0.579
SC-11	Mercury	mg/l	2	0	2021-03-24	2021-09-29	8e-06	8e-06	0	8e-06
SC-11	Molybdenum	mg/l	2	0	2021-03-24	2021-09-29	0.0019	0.0024	0.0022	0.00215
SC-11	pH	SU	2	0	2021-03-24	2021-09-29	7.5	7.6	7.55	7.55
SC-11	Rad226+228	pCi/L	2	0	2021-03-24	2021-09-29	0.438	0.661	0.549	0.549
SC-11	Selenium	mg/l	2	0	2021-03-24	2021-09-29	0.169	0.226	0.198	0.198
SC-11	Sulfate	mg/l	2	0	2021-03-24	2021-09-29	8120	8170	8145	8145
SC-11	TDS	mg/l	2	0	2021-03-24	2021-09-29	13900	14200	14050	14050
SC-11	Thallium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04

Table 12: 2021 Summary Statistics for CCR Parameters at Well SC-12

Well	COC	Units	N	NDs	Min.Date	Max.Date	Minimum	Maximum	Mean	Median
SC-12	Antimony	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-12	Arsenic	mg/l	3	0	2021-03-24	2021-09-29	0.0013	0.0056	0.0039	0.0049
SC-12	Barium	mg/l	2	0	2021-03-24	2021-09-29	0.0057	0.0084	0.007	0.00705
SC-12	Beryllium	mg/l	2	2	2021-03-24	2021-09-29	2e-04	2e-04	1e-04	2e-04
SC-12	Boron	mg/l	3	0	2021-03-24	2021-09-29	3.92	4.18	4.05	4.06
SC-12	Cadmium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-12	Calcium	mg/l	3	0	2021-03-24	2021-09-29	361	387	375	376
SC-12	Chloride	mg/l	3	0	2021-03-24	2021-09-29	285	303	294	293
SC-12	Chromium	mg/l	3	1	2021-03-24	2021-09-29	0.001	0.0021	0.0016	0.0018
SC-12	Cobalt	mg/l	2	2	2021-03-24	2021-09-29	0.005	0.005	0.0025	0.005
SC-12	Fluoride	mg/l	3	0	2021-03-24	2021-09-29	0.95	1.37	1.23	1.36
SC-12	Lead	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-12	Lithium	mg/l	3	0	2021-03-24	2021-09-29	0.434	0.467	0.449	0.446
SC-12	Mercury	mg/l	2	0	2021-03-24	2021-09-29	2e-06	3e-06	0	2.5e-06
SC-12	Molybdenum	mg/l	3	0	2021-03-24	2021-09-29	0.0033	0.0049	0.0043	0.0047
SC-12	pH	SU	2	0	2021-03-24	2021-09-29	7.5	7.5	7.5	7.5
SC-12	Rad226+228	pCi/L	3	0	2021-03-24	2021-09-29	0.331	0.448	0.372	0.338
SC-12	Selenium	mg/l	3	0	2021-03-24	2021-09-29	0.0094	0.012	0.0106	0.0104
SC-12	Sulfate	mg/l	3	0	2021-03-24	2021-09-29	9370	10000	9727	9810
SC-12	TDS	mg/l	3	0	2021-03-24	2021-09-29	15200	15400	15300	15300
SC-12	Thallium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04

Table 13: 2021 Summary Statistics for CCR Parameters at Well SC-13

Well	COC	Units	N	NDs	Min.Date	Max.Date	Minimum	Maximum	Mean	Median
SC-13	Antimony	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-13	Arsenic	mg/l	2	1	2021-03-24	2021-09-29	0.001	0.0049	0.0029	0.001
SC-13	Barium	mg/l	3	0	2021-03-24	2021-09-29	0.0036	0.0045	0.0041	0.0042
SC-13	Beryllium	mg/l	2	2	2021-03-24	2021-09-29	2e-04	2e-04	1e-04	2e-04
SC-13	Boron	mg/l	3	0	2021-03-24	2021-09-29	1.5	1.52	1.51	1.51
SC-13	Cadmium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-13	Calcium	mg/l	3	0	2021-03-24	2021-09-29	344	373	355	349
SC-13	Chloride	mg/l	2	0	2021-03-24	2021-09-29	171	178	174	174
SC-13	Chromium	mg/l	3	2	2021-03-24	2021-09-29	0.001	0.0011	0.001	0.001
SC-13	Cobalt	mg/l	2	2	2021-03-24	2021-09-29	0.005	0.005	0.0025	0.005
SC-13	Fluoride	mg/l	3	0	2021-03-24	2021-09-29	0.8	1.11	0.907	0.81
SC-13	Lead	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-13	Lithium	mg/l	3	0	2021-03-24	2021-09-29	0.319	0.364	0.347	0.358
SC-13	Mercury	mg/l	2	1	2021-03-24	2021-09-29	2e-06	2e-06	0	2e-06
SC-13	Molybdenum	mg/l	3	0	2021-03-24	2021-09-29	0.0021	0.0029	0.0024	0.0023
SC-13	pH	SU	2	0	2021-03-24	2021-09-29	7.5	7.6	7.55	7.55
SC-13	Rad226+228	pCi/L	3	0	2021-03-24	2021-09-29	0.277	0.576	0.442	0.473
SC-13	Selenium	mg/l	3	0	2021-03-24	2021-09-29	0.0186	0.0224	0.0207	0.021
SC-13	Sulfate	mg/l	3	0	2021-03-24	2021-09-29	7940	8220	8107	8160
SC-13	TDS	mg/l	3	0	2021-03-24	2021-09-29	12400	12600	12533	12600
SC-13	Thallium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04

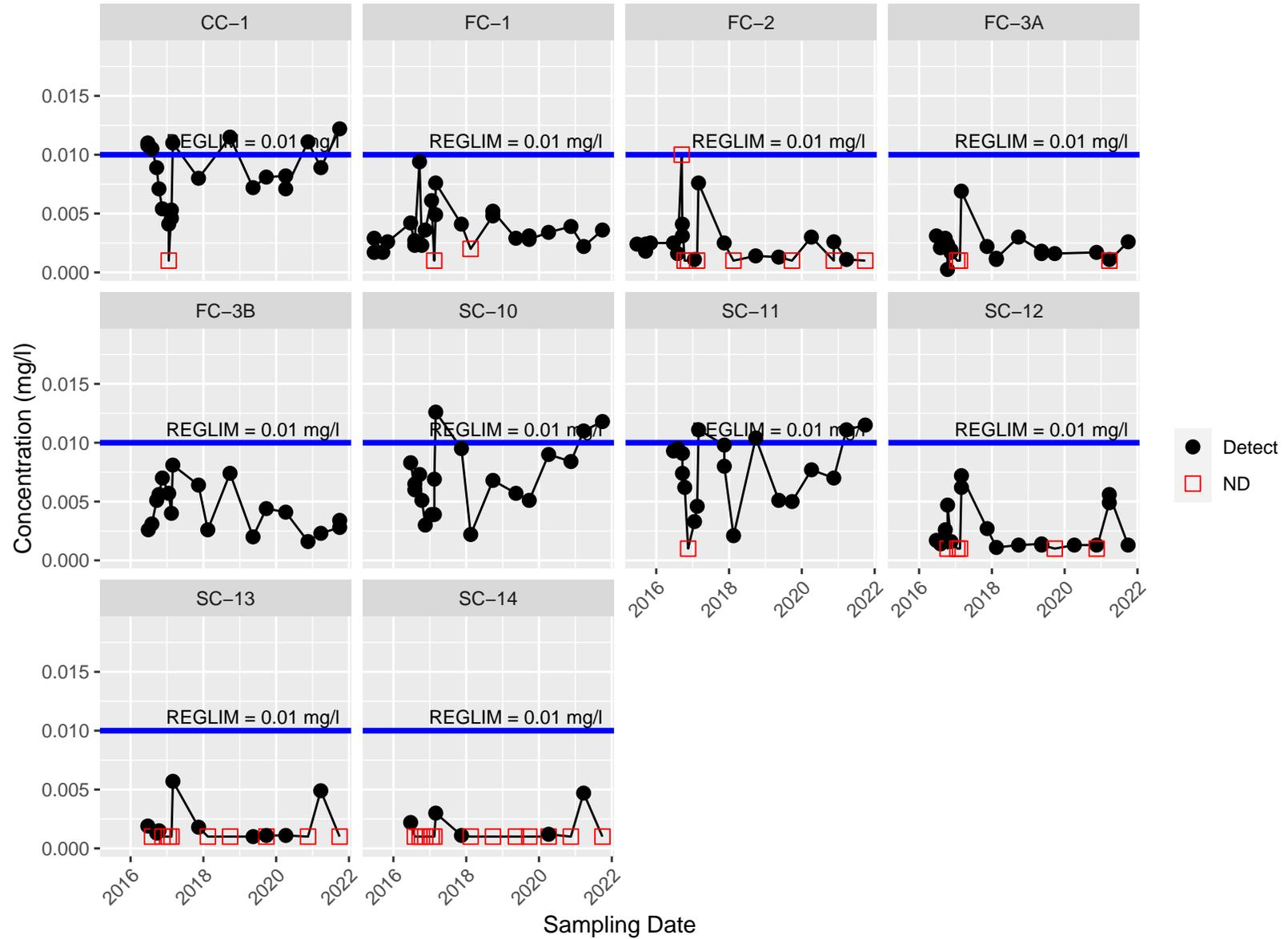
Table 14: 2021 Summary Statistics for CCR Parameters at Well SC-14

Well	COC	Units	N	NDs	Min.Date	Max.Date	Minimum	Maximum	Mean	Median
SC-14	Antimony	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-14	Arsenic	mg/l	2	1	2021-03-24	2021-09-29	0.001	0.0047	0.0028	0.001
SC-14	Barium	mg/l	2	0	2021-03-24	2021-09-29	0.0037	0.0045	0.0041	0.0041
SC-14	Beryllium	mg/l	2	2	2021-03-24	2021-09-29	2e-04	2e-04	1e-04	2e-04
SC-14	Boron	mg/l	2	0	2021-03-24	2021-09-29	1.46	1.52	1.49	1.49
SC-14	Cadmium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-14	Calcium	mg/l	1	0	2021-09-29	2021-09-29	348	348	348	348
SC-14	Chloride	mg/l	2	0	2021-03-24	2021-09-29	159	163	161	161
SC-14	Chromium	mg/l	2	1	2021-03-24	2021-09-29	0.001	0.0015	0.0012	0.001
SC-14	Cobalt	mg/l	2	2	2021-03-24	2021-09-29	0.005	0.005	0.0025	0.005
SC-14	Fluoride	mg/l	2	0	2021-03-24	2021-09-29	0.74	1.05	0.895	0.895
SC-14	Lead	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04
SC-14	Lithium	mg/l	2	0	2021-03-24	2021-09-29	0.311	0.348	0.33	0.33
SC-14	Mercury	mg/l	2	2	2021-03-24	2021-09-29	2e-06	2e-06	0	2e-06
SC-14	Molybdenum	mg/l	2	0	2021-03-24	2021-09-29	0.0073	0.0083	0.0078	0.0078
SC-14	pH	SU	2	0	2021-03-24	2021-09-29	7.6	7.6	7.6	7.6
SC-14	Rad226+228	pCi/L	2	0	2021-03-24	2021-09-29	0.309	0.611	0.46	0.46
SC-14	Selenium	mg/l	2	0	2021-03-24	2021-09-29	0.0034	0.0049	0.0042	0.00415
SC-14	Sulfate	mg/l	2	0	2021-03-24	2021-09-29	7560	7920	7740	7740
SC-14	TDS	mg/l	2	0	2021-03-24	2021-09-29	11600	11600	11600	11600
SC-14	Thallium	mg/l	2	2	2021-03-24	2021-09-29	5e-04	5e-04	3e-04	5e-04

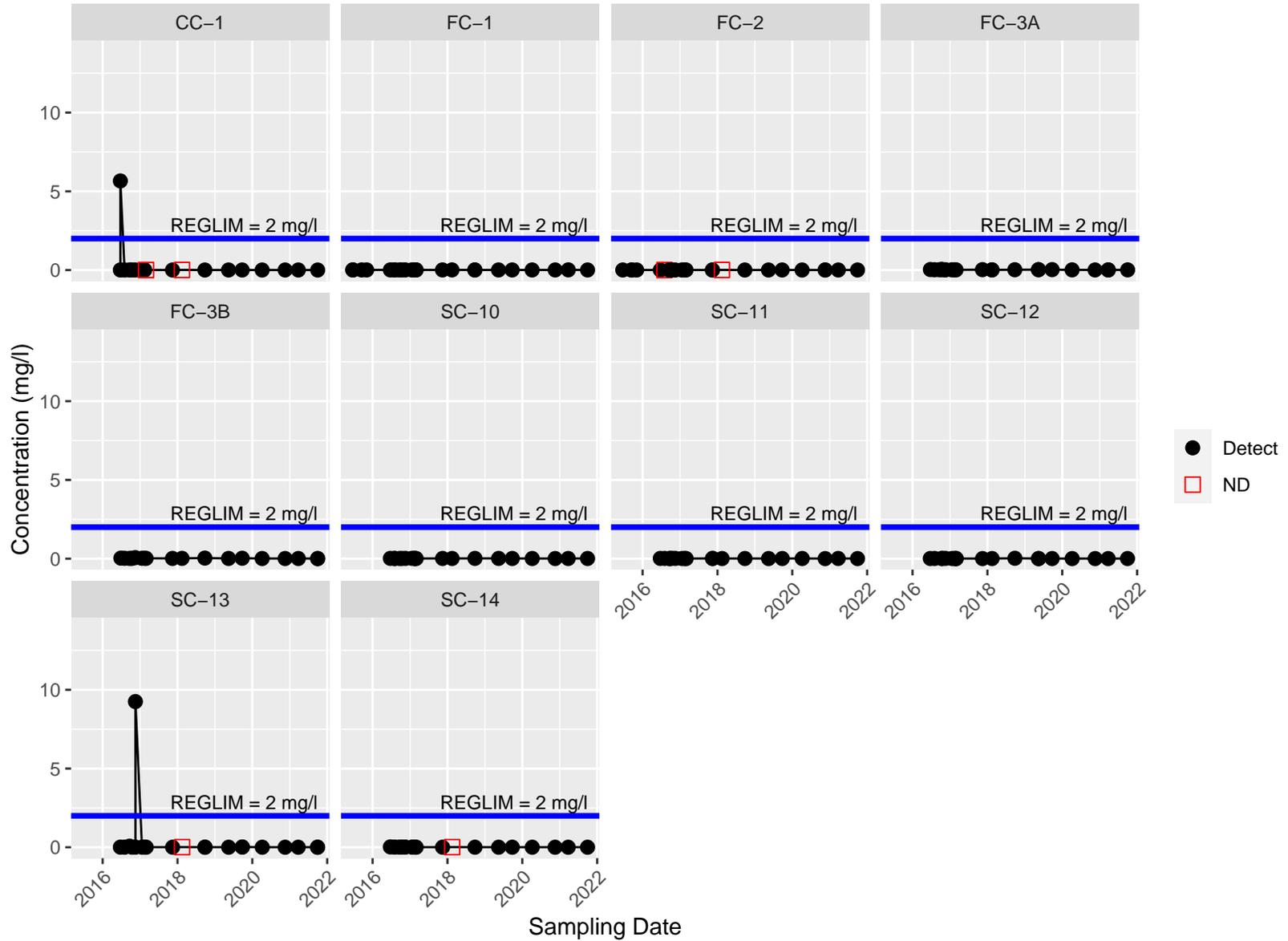
Appendix B: Exploratory Plots

1. Time Series Plots of Each Parameter
2. Box Plots of Each Parameter

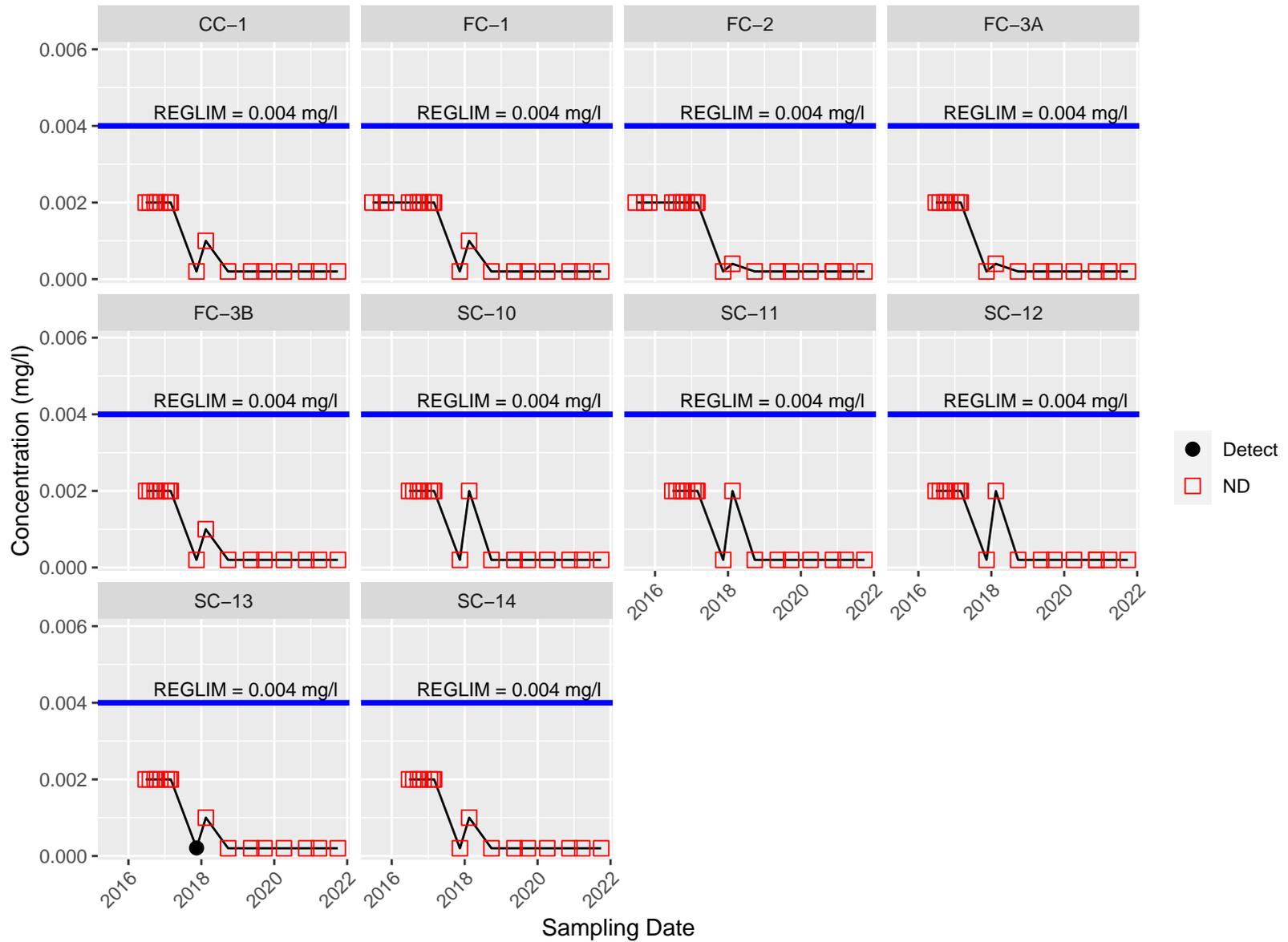
Historical Time Series Plots for Arsenic



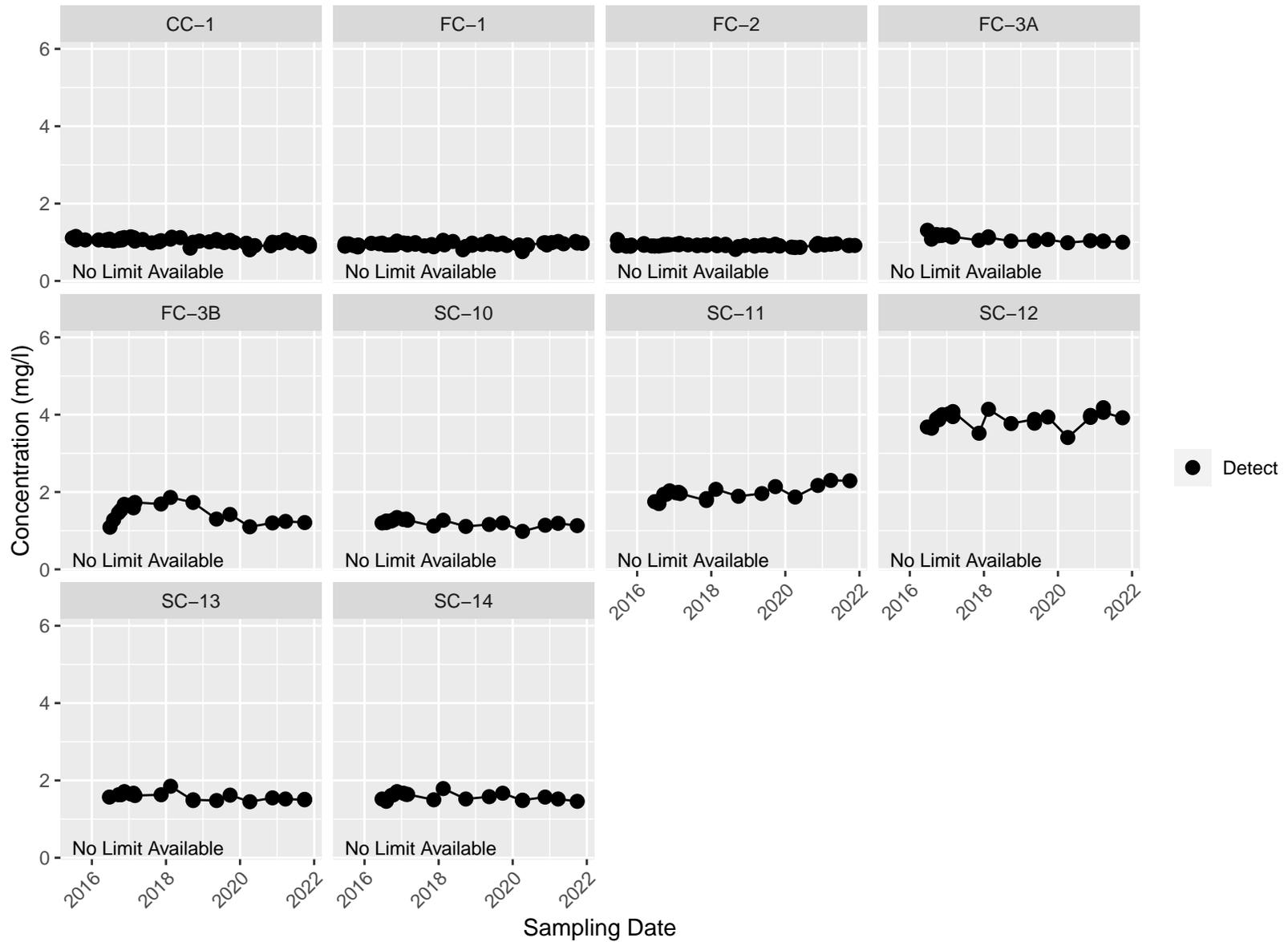
Historical Time Series Plots for Barium



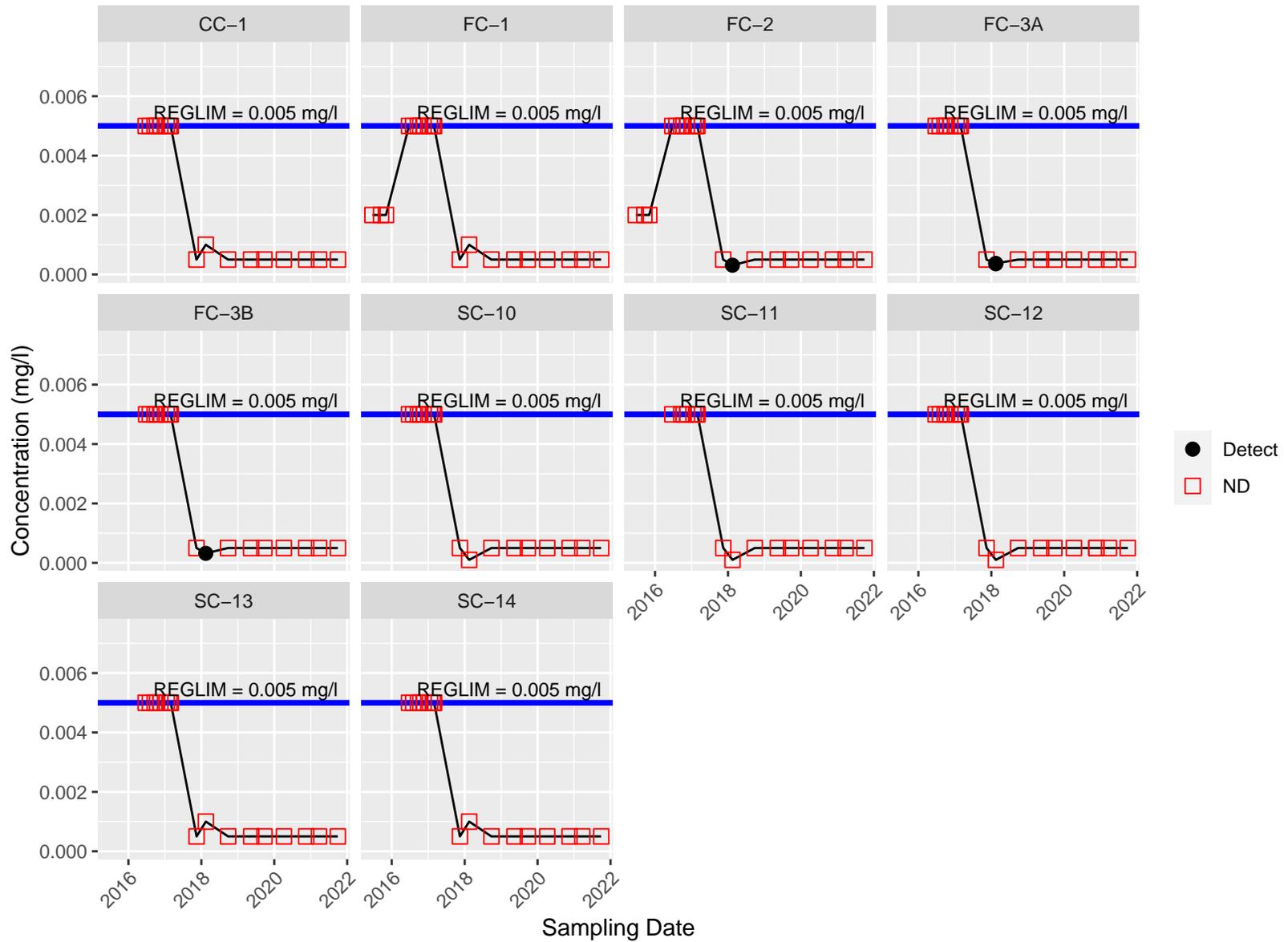
Historical Time Series Plots for Beryllium



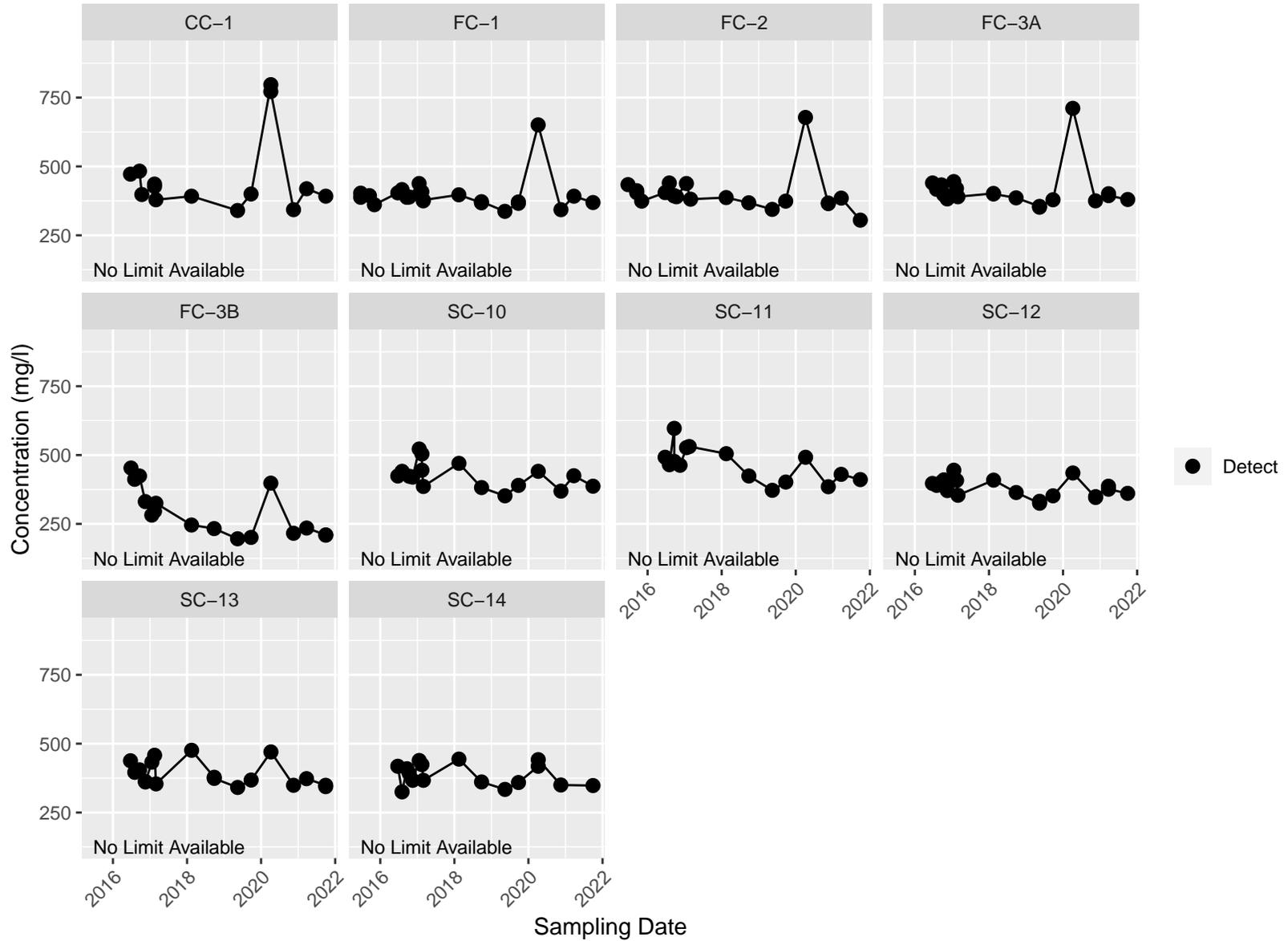
Historical Time Series Plots for Boron



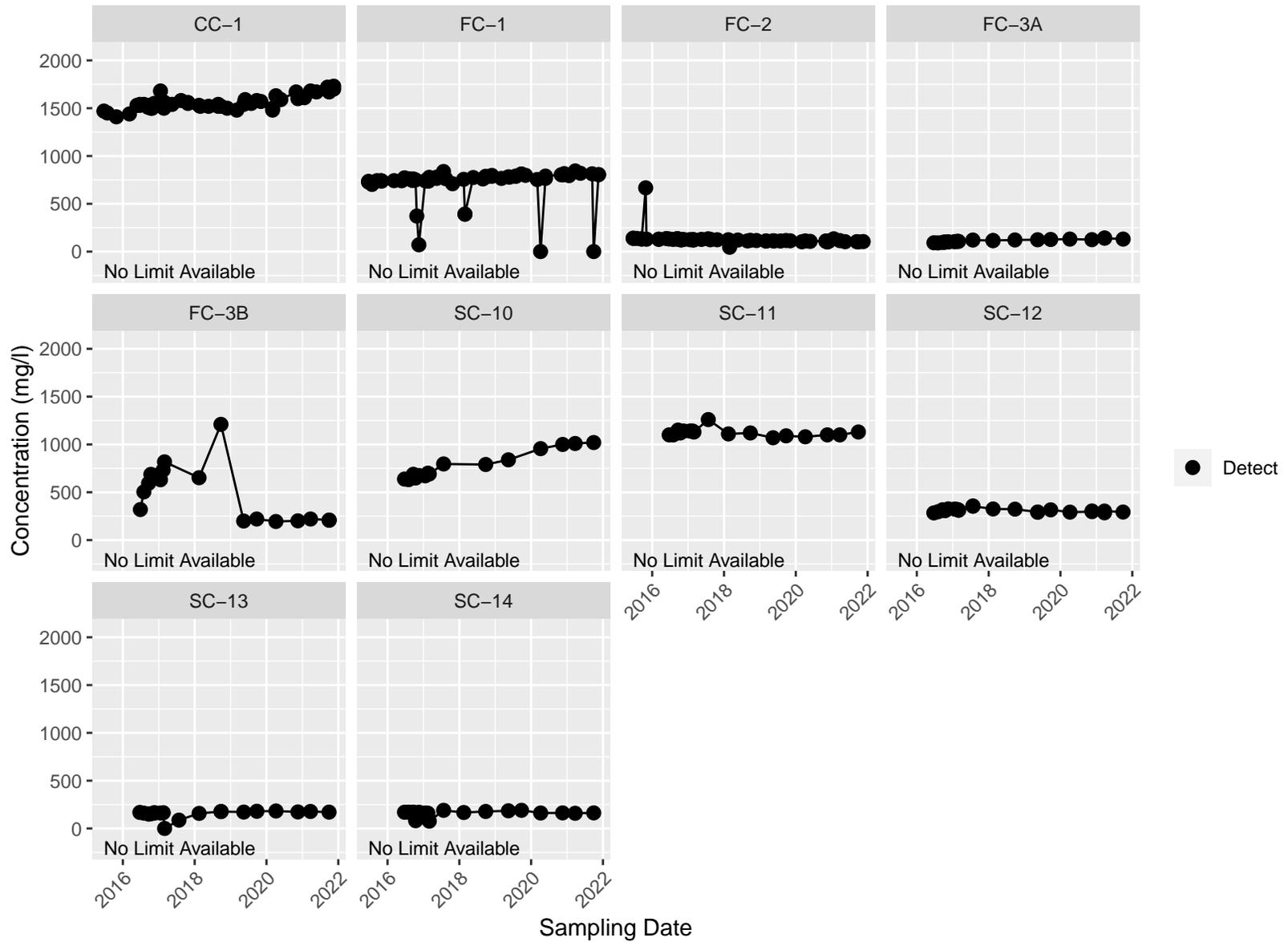
Historical Time Series Plots for Cadmium



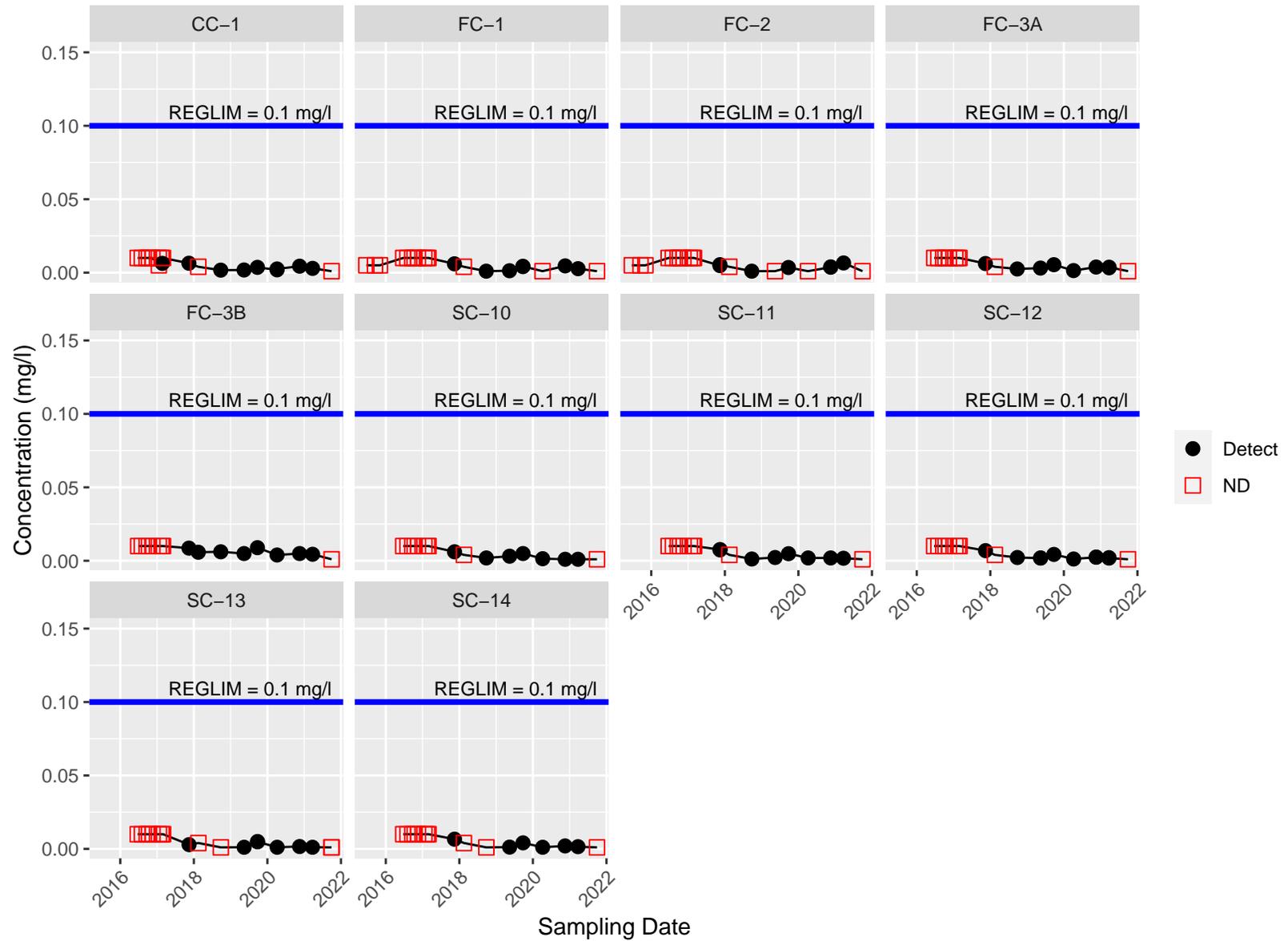
Historical Time Series Plots for Calcium



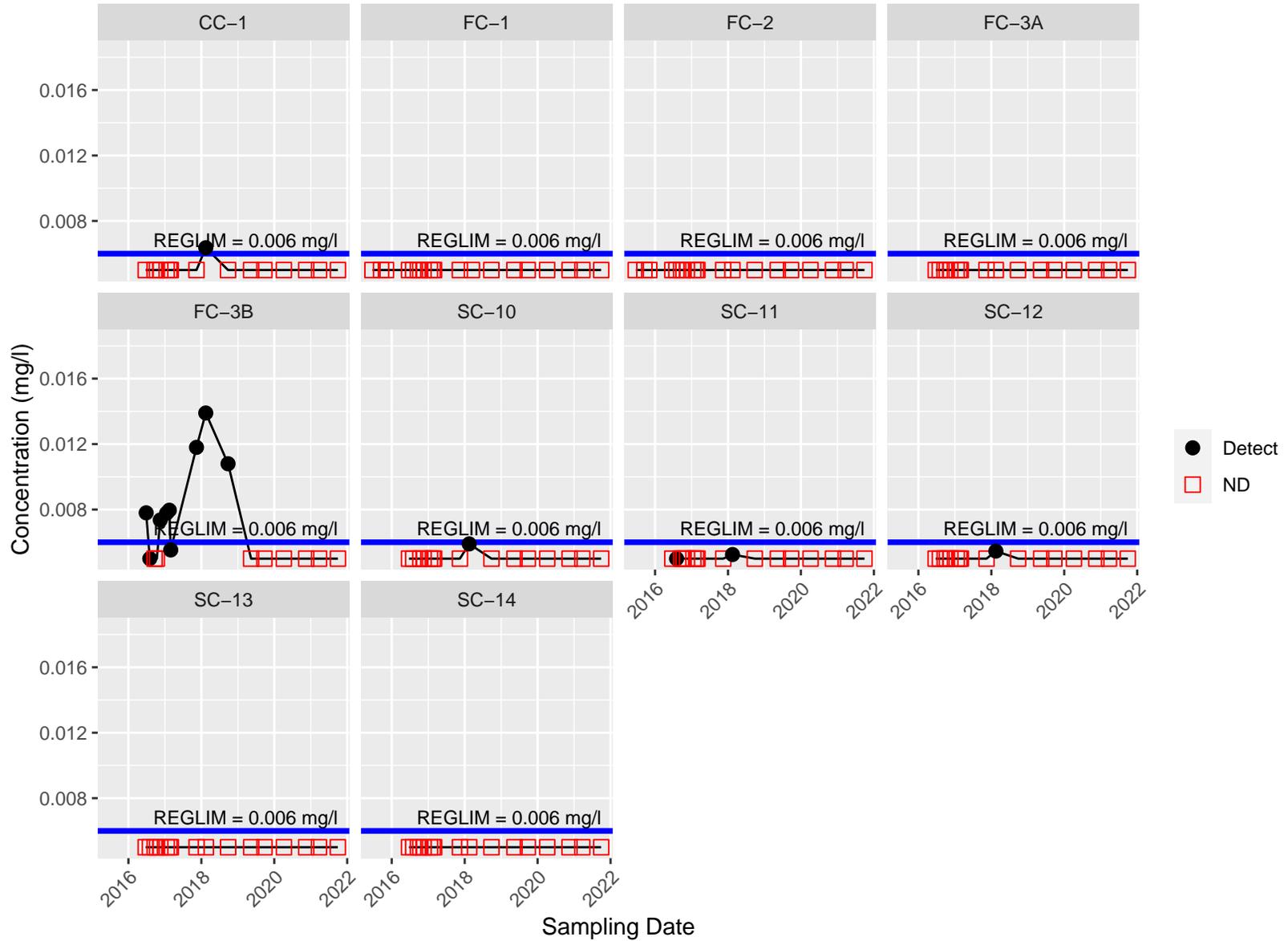
Historical Time Series Plots for Chloride



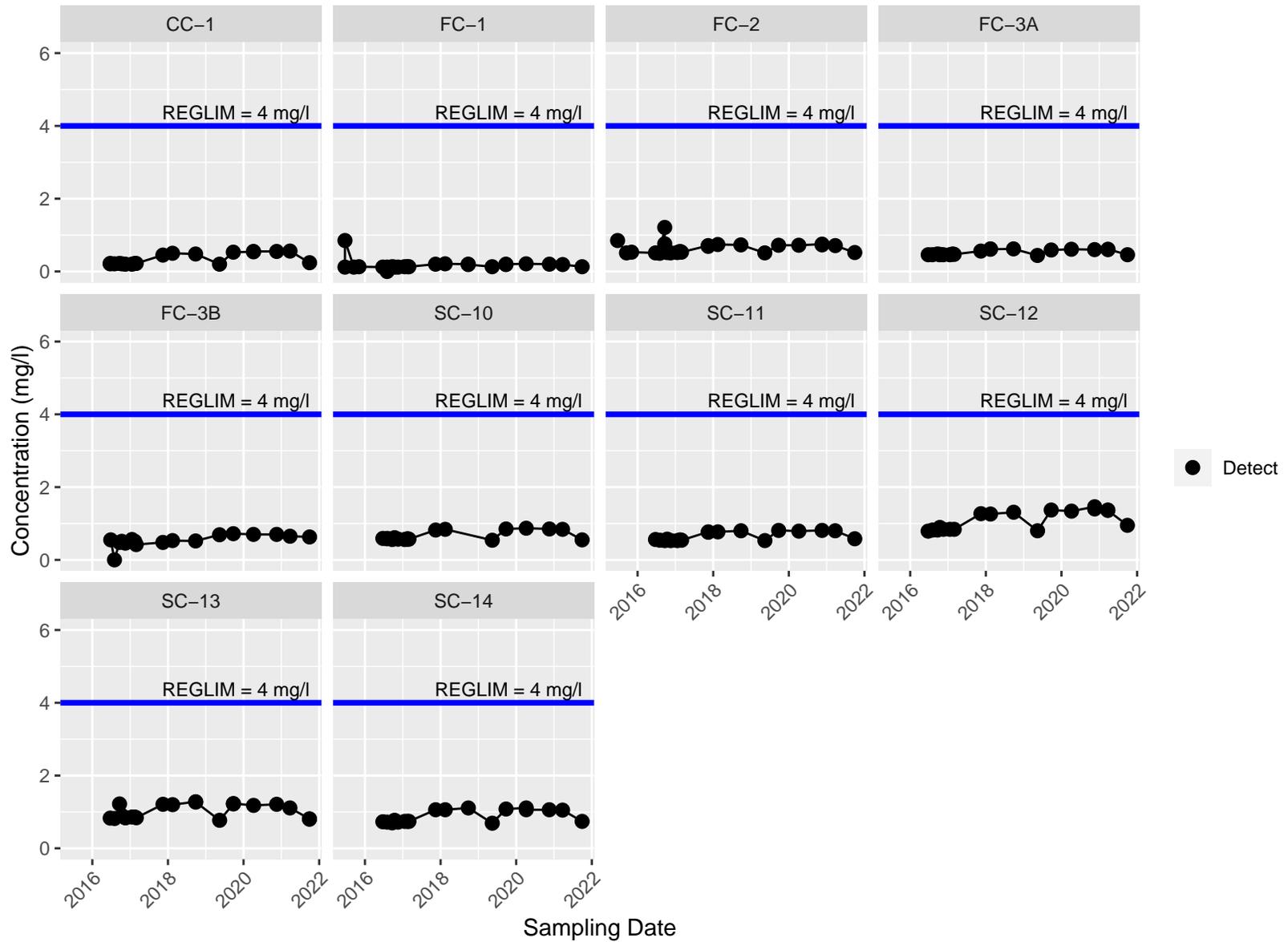
Historical Time Series Plots for Chromium



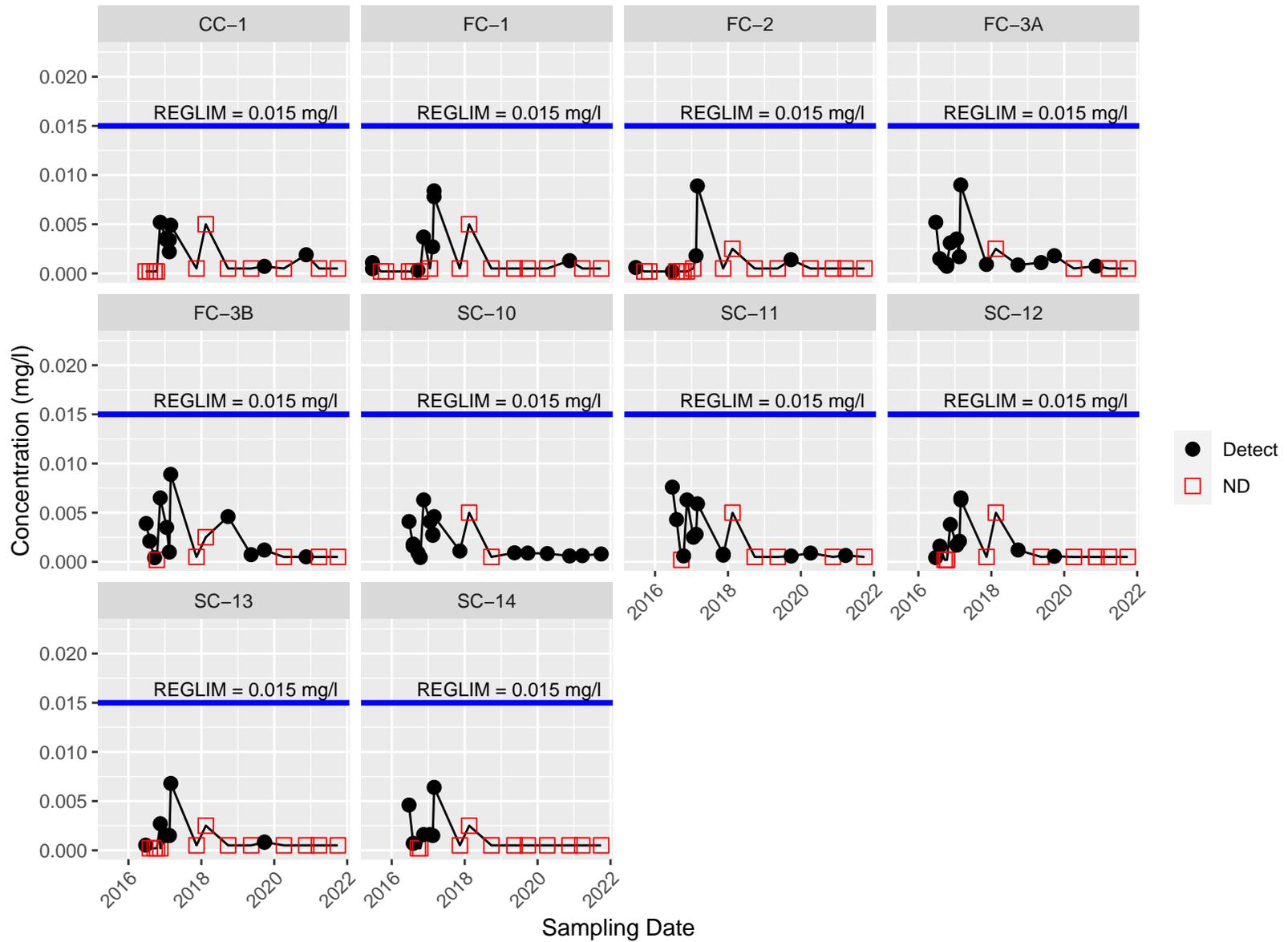
Historical Time Series Plots for Cobalt



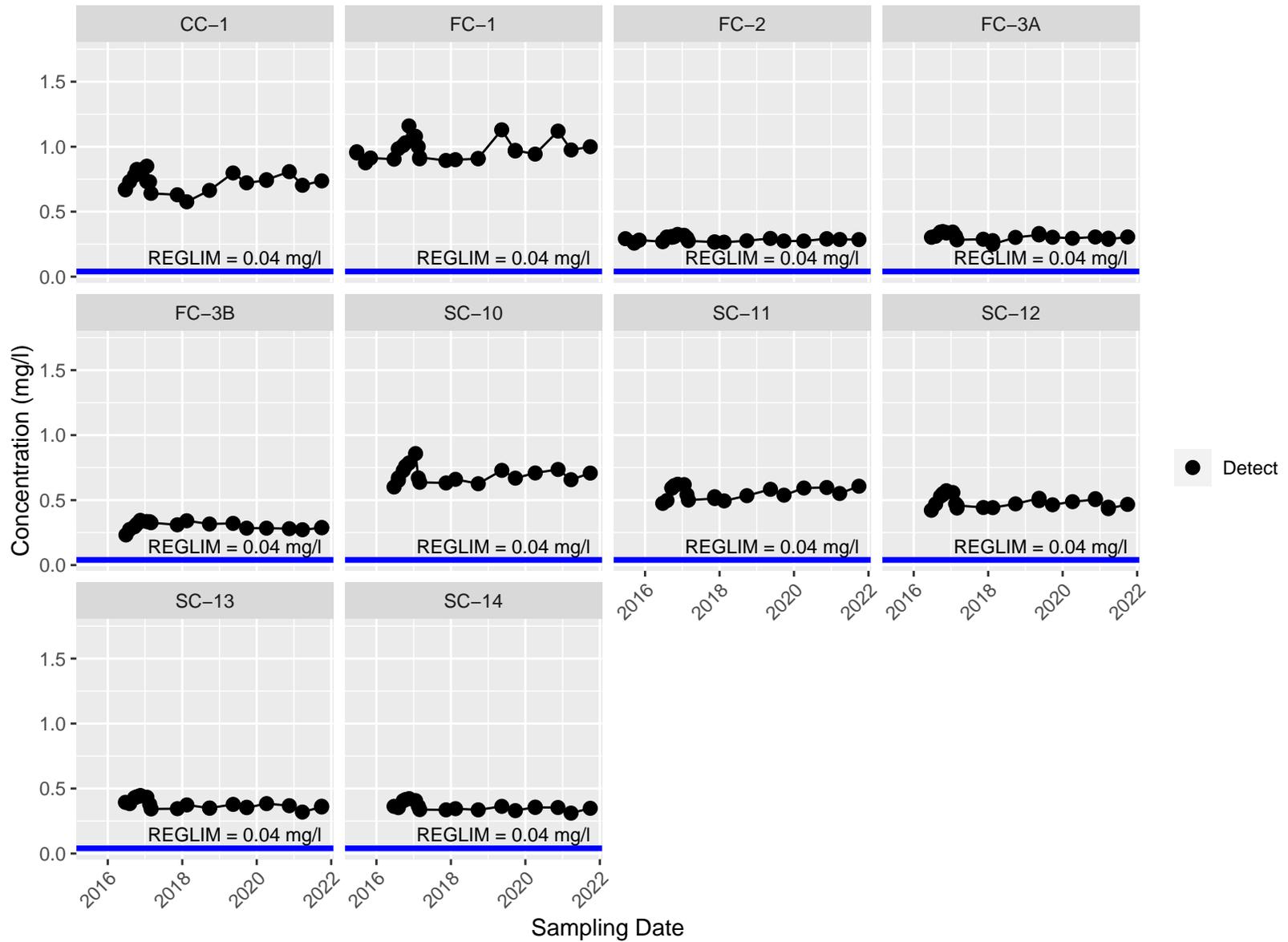
Historical Time Series Plots for Fluoride



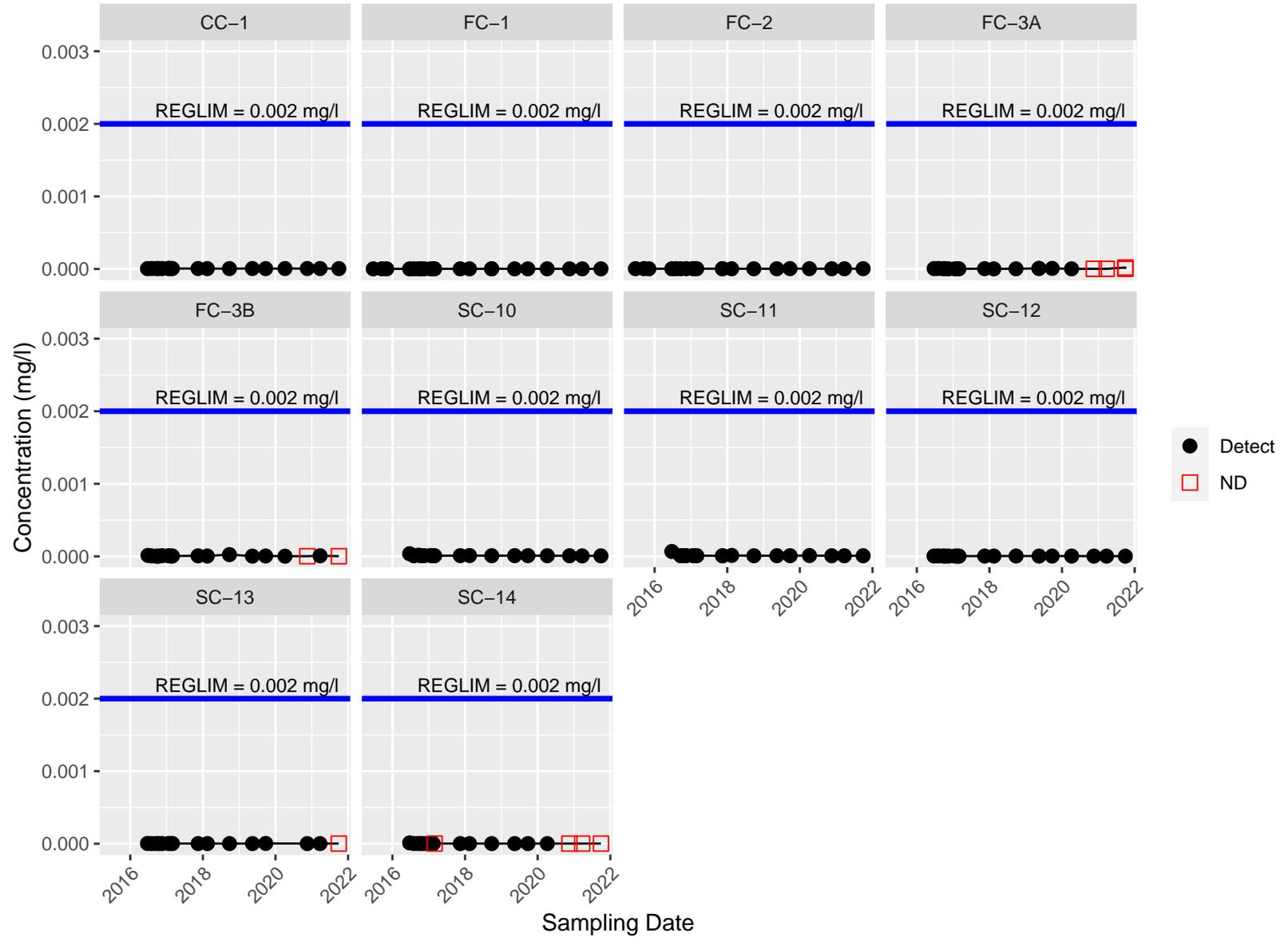
Historical Time Series Plots for Lead



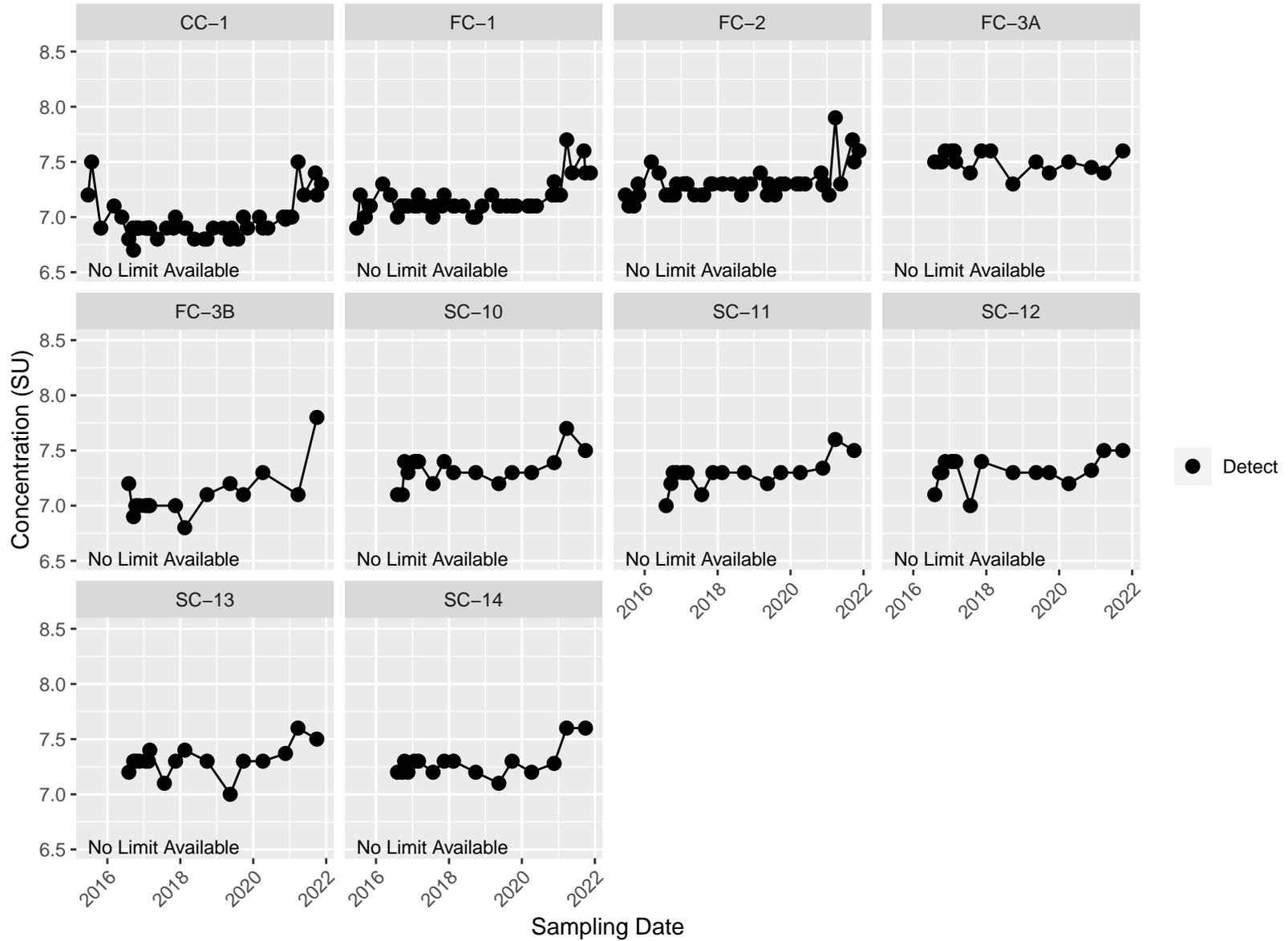
Historical Time Series Plots for Lithium



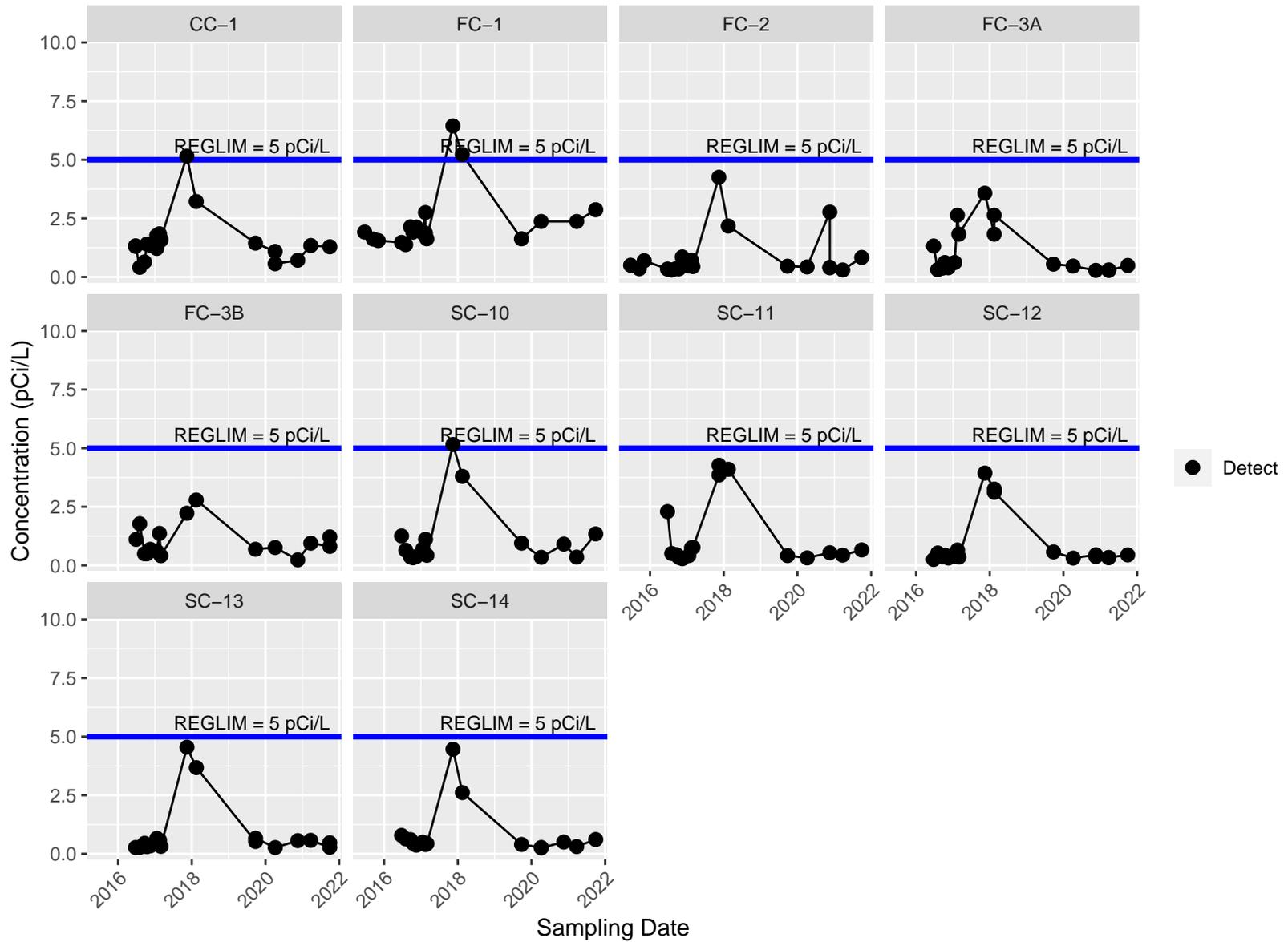
Historical Time Series Plots for Mercury



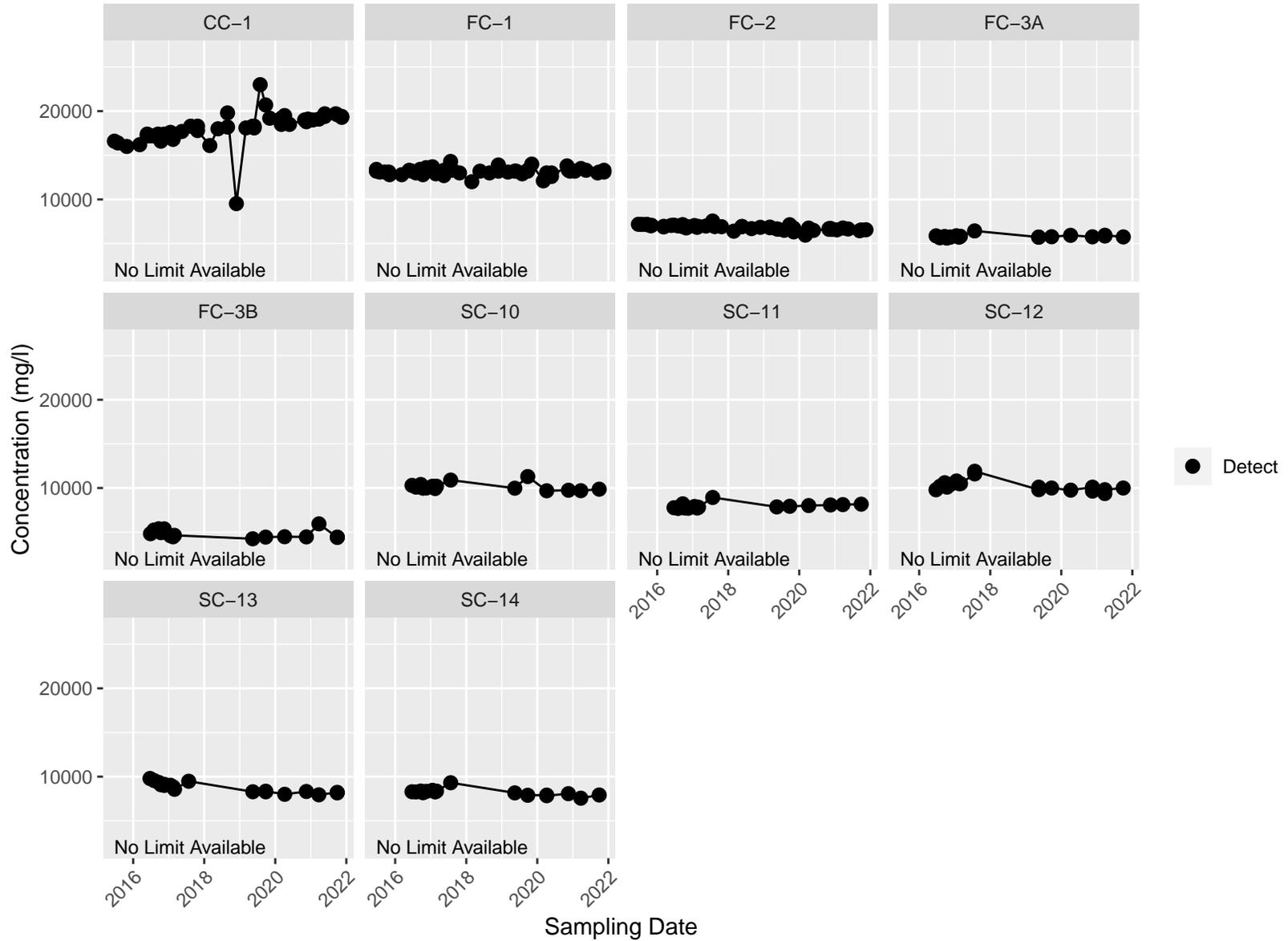
Historical Time Series Plots for pH



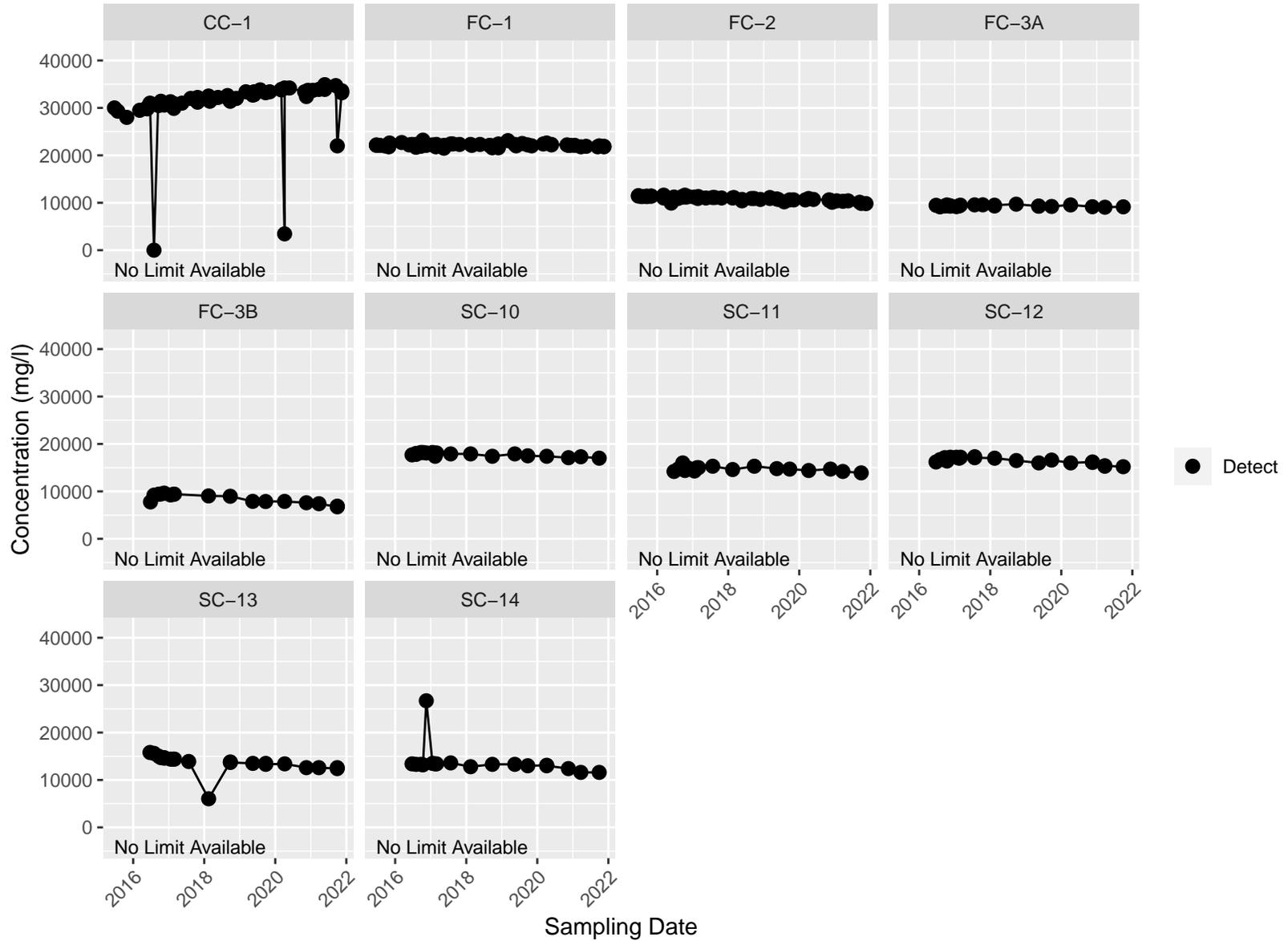
Historical Time Series Plots for Rad226+228



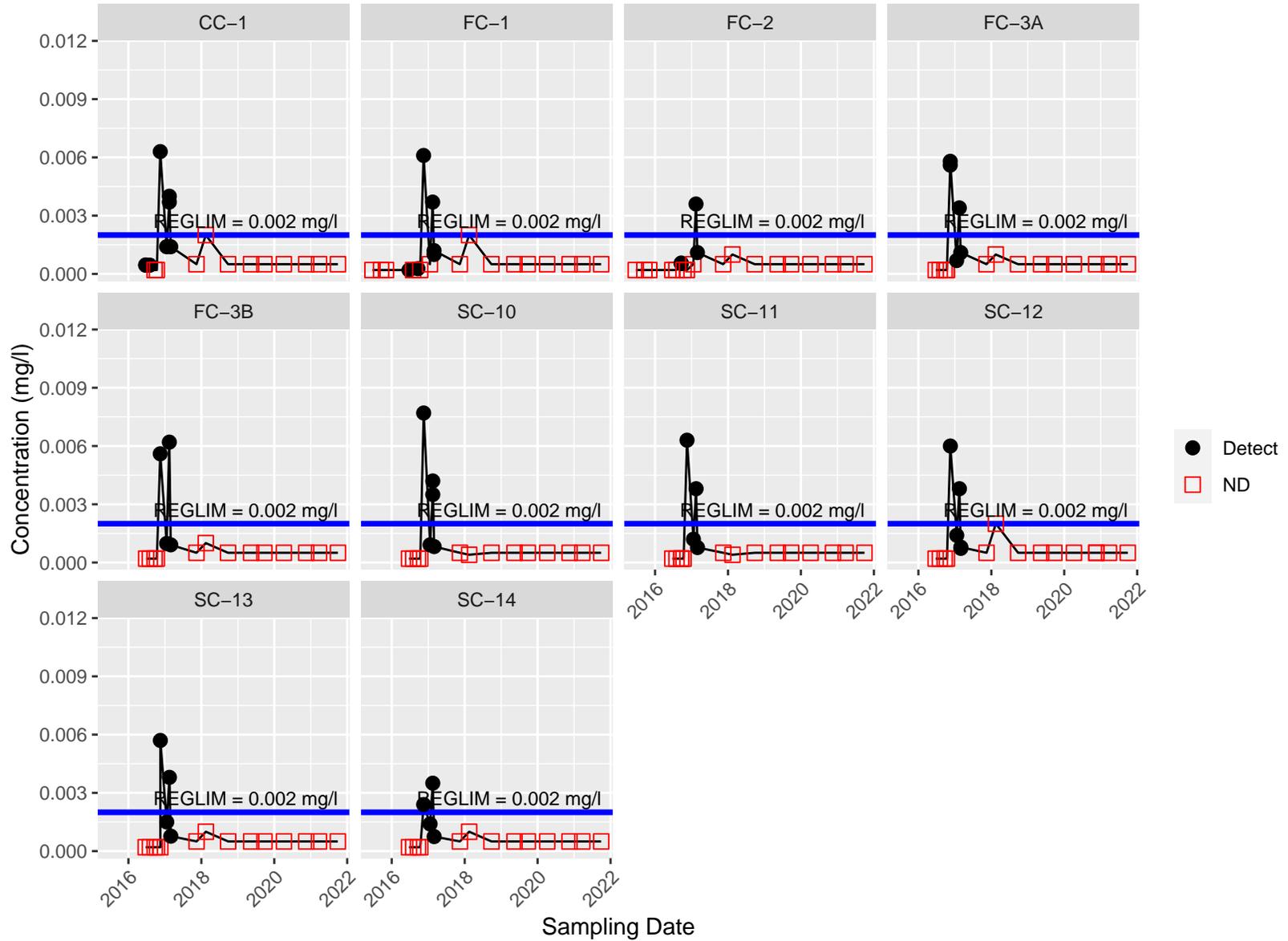
Historical Time Series Plots for Sulfate



Historical Time Series Plots for TDS

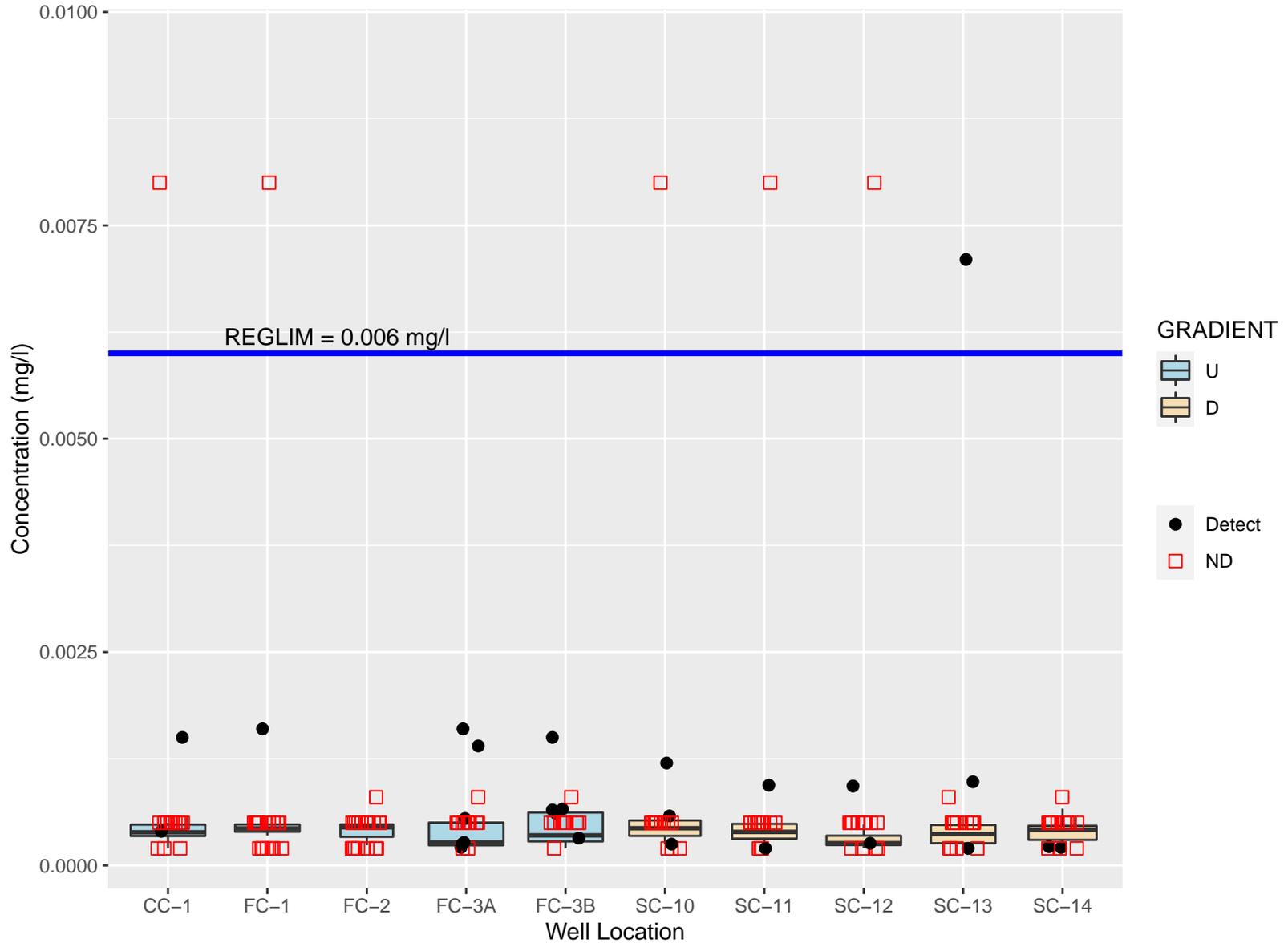


Historical Time Series Plots for Thallium

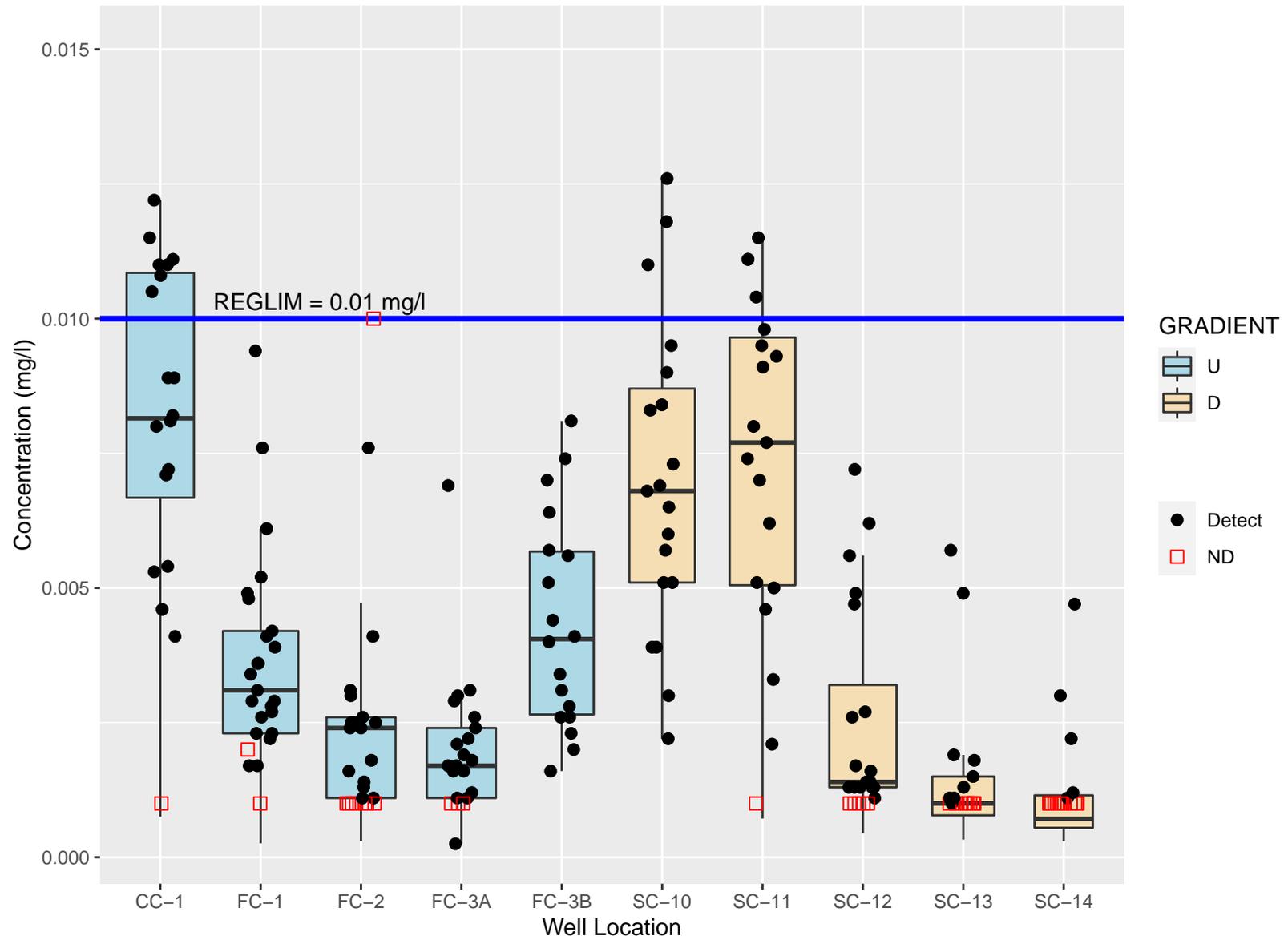


Box Plots

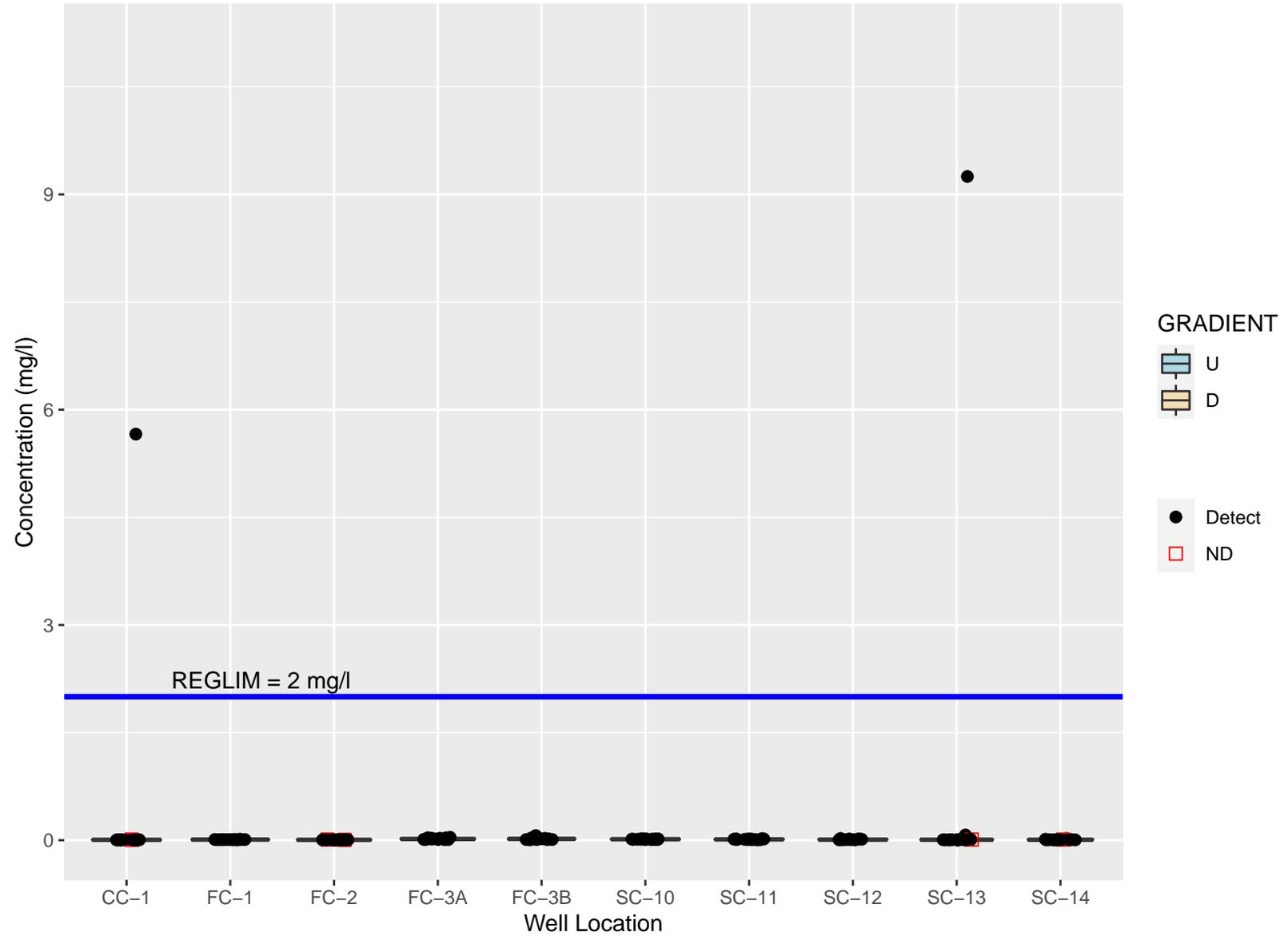
Box Plots for Antimony With REGLIM Overlay, Grouped by Gradient



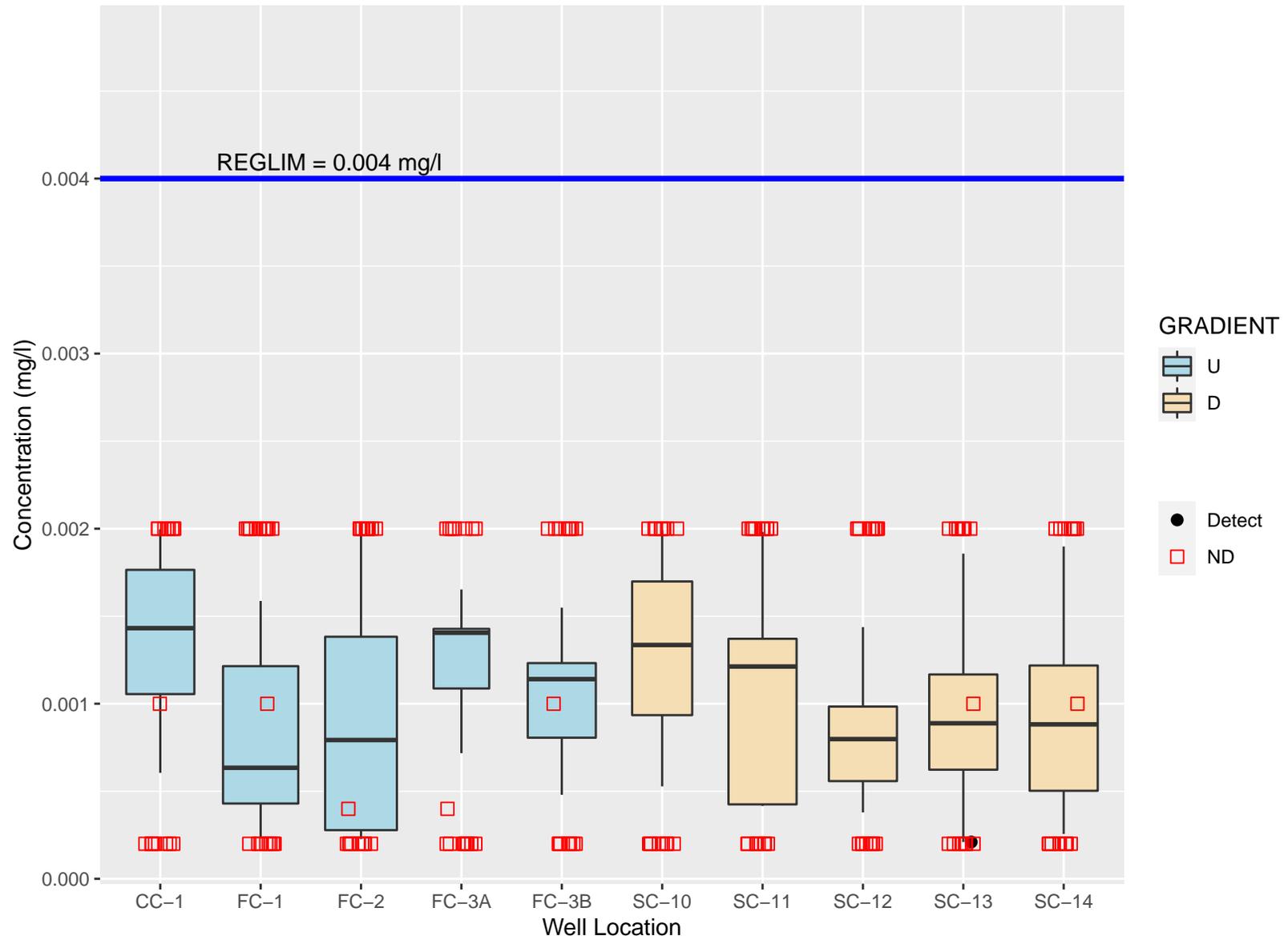
Box Plots for Arsenic With REGLIM Overlay, Grouped by Gradient



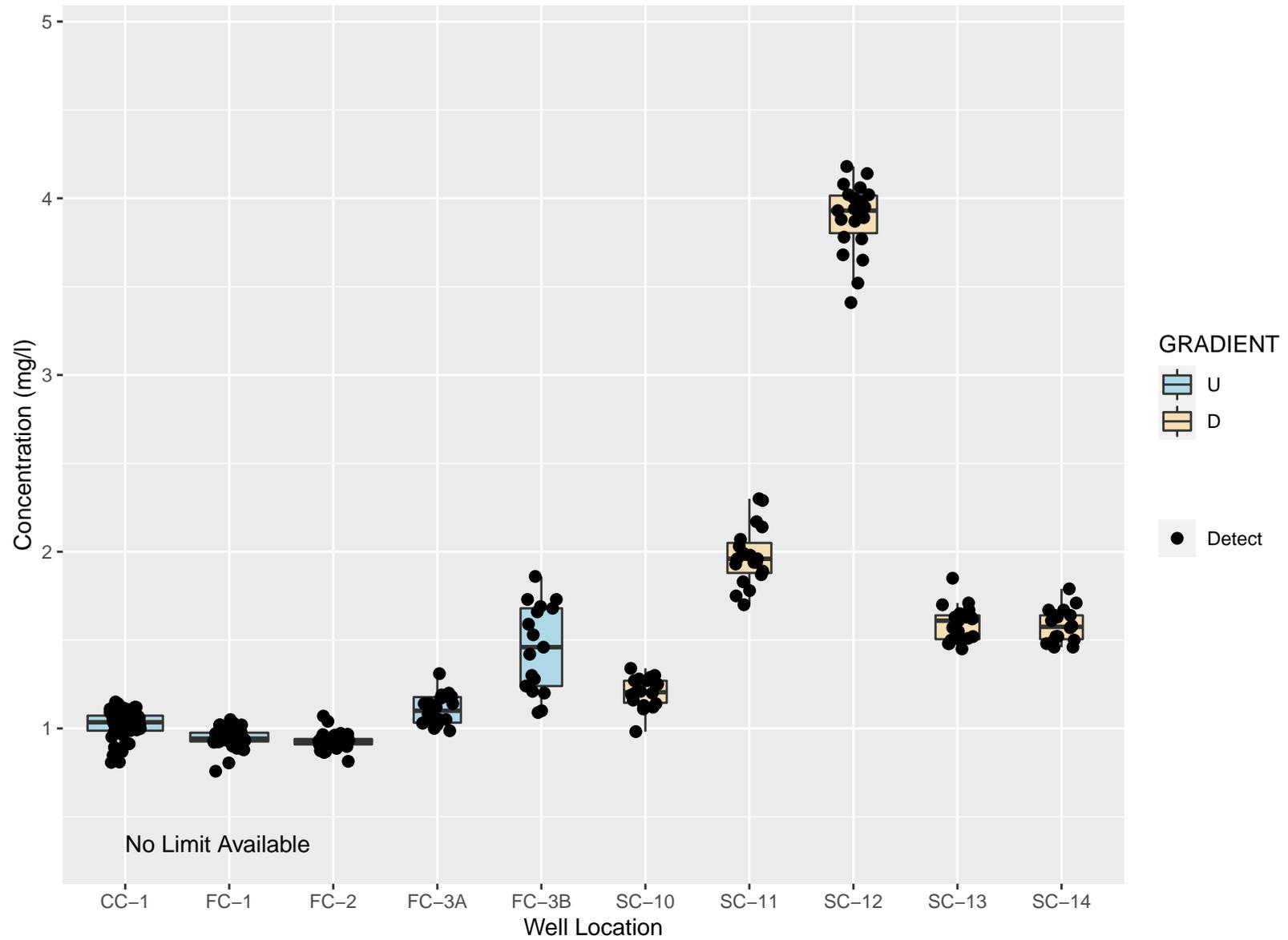
Box Plots for Barium With REGLIM Overlay, Grouped by Gradient



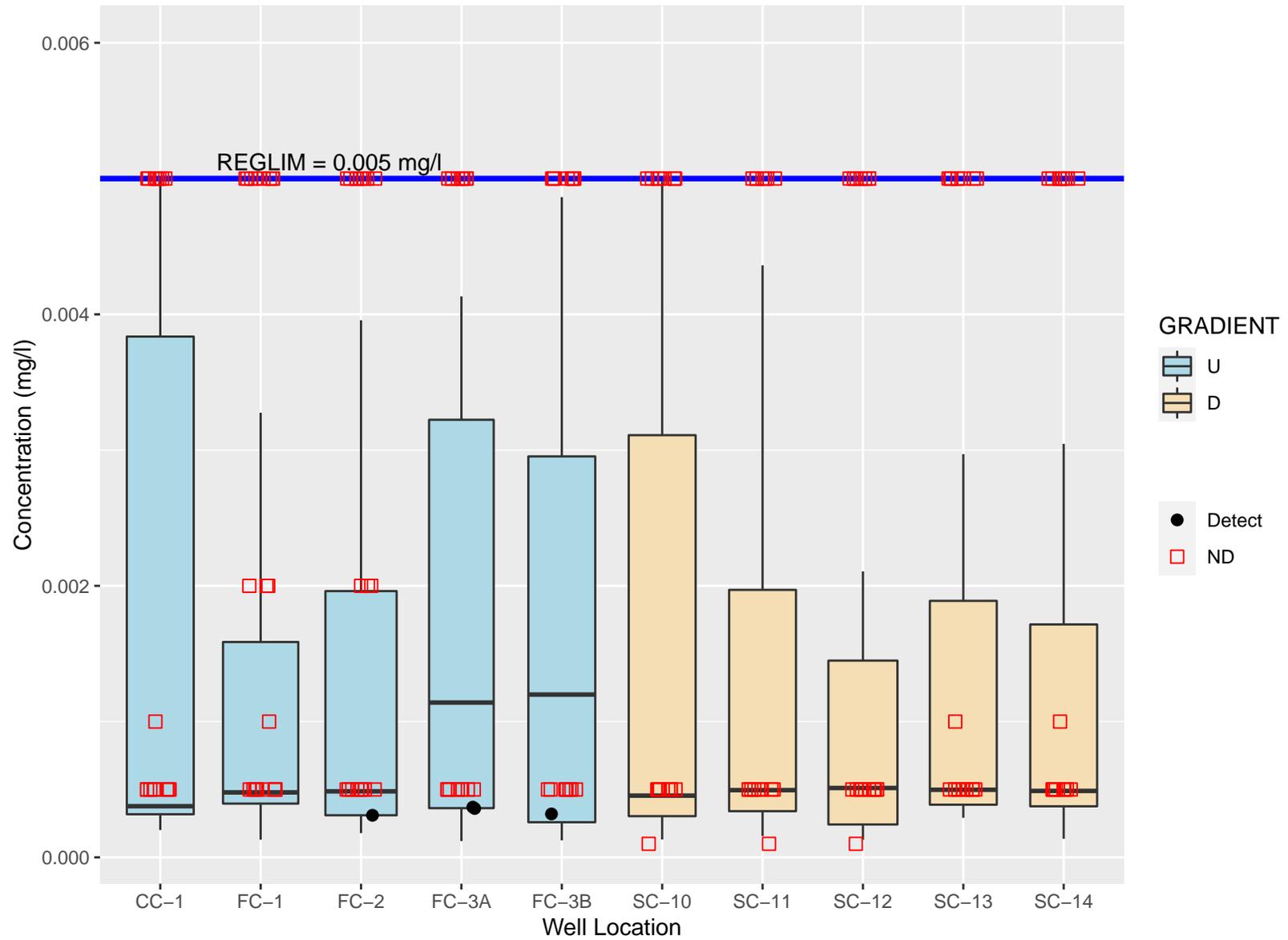
Box Plots for Beryllium With REGLIM Overlay, Grouped by Gradient



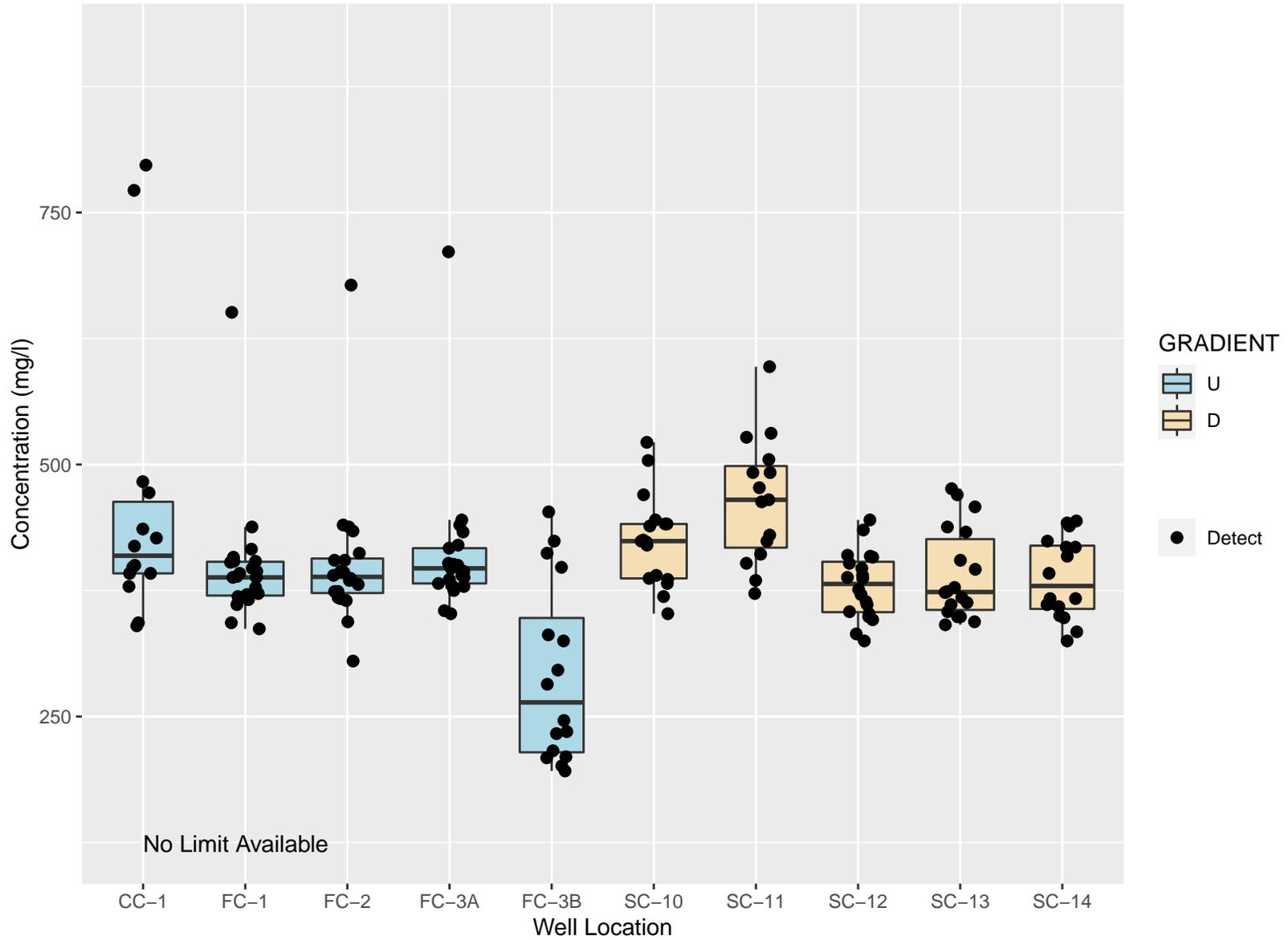
Box Plots for Boron With REGLIM Overlay, Grouped by Gradient



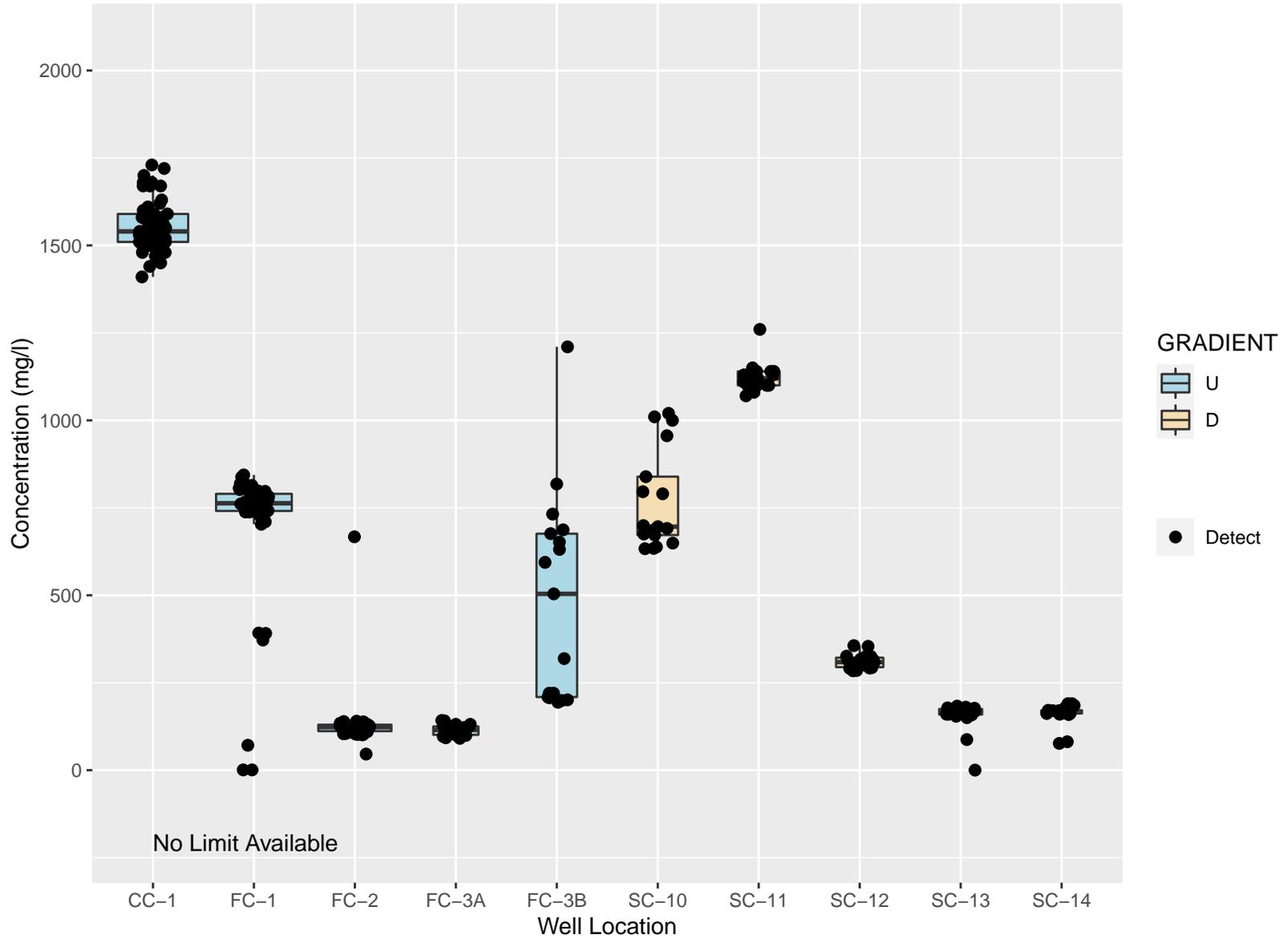
Box Plots for Cadmium With REGLIM Overlay, Grouped by Gradient



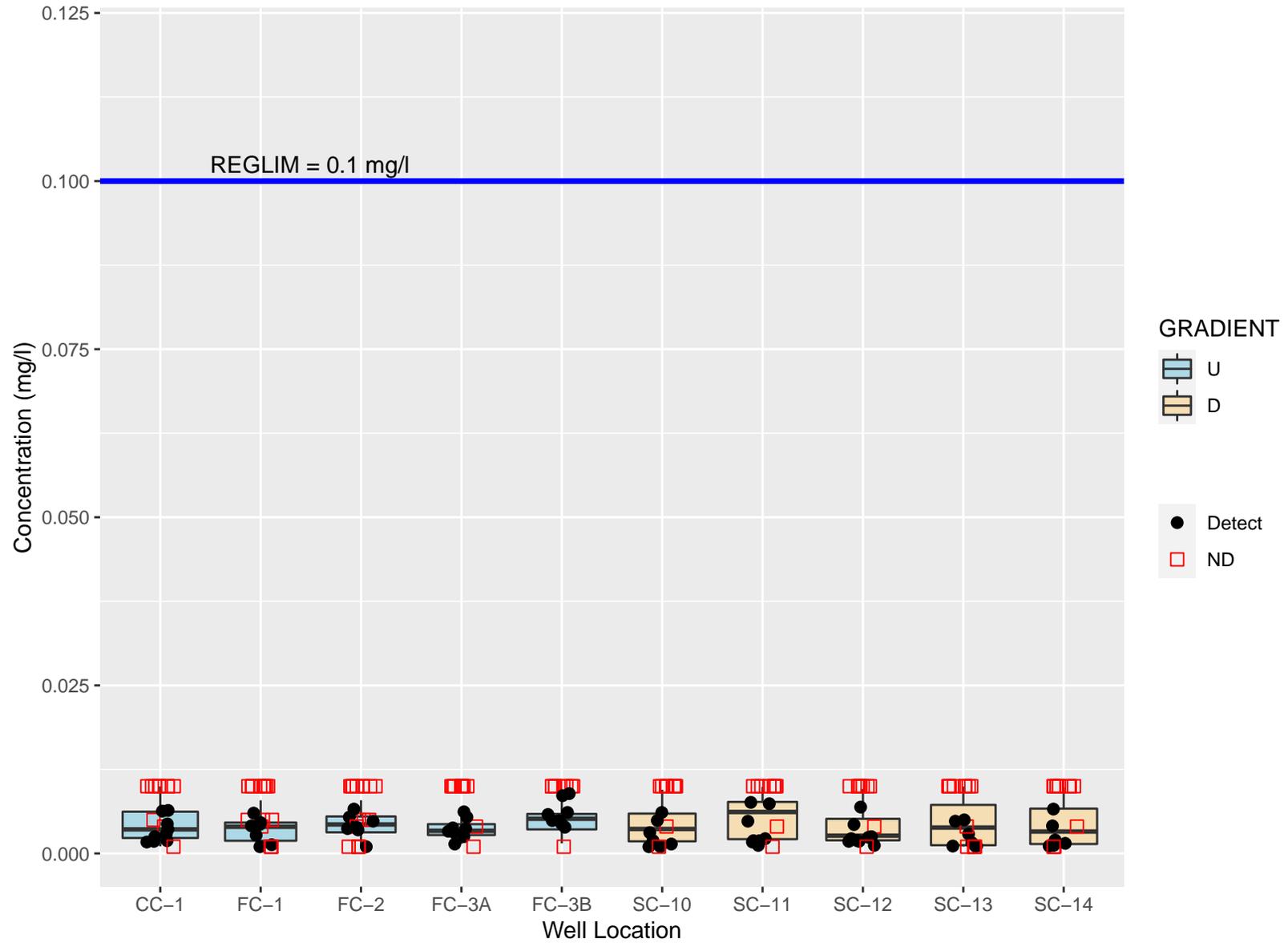
Box Plots for Calcium With REGLIM Overlay, Grouped by Gradient



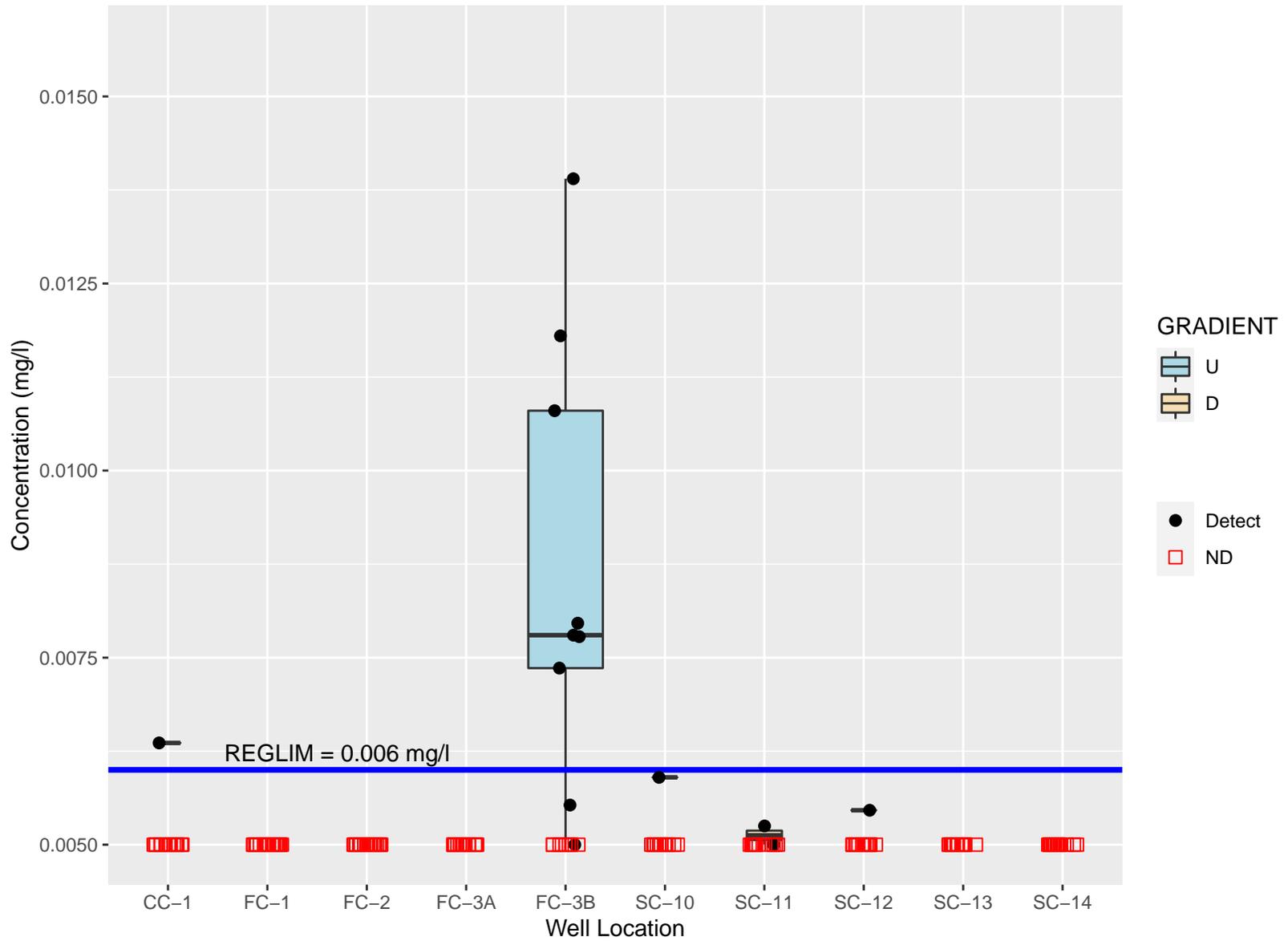
Box Plots for Chloride With REGLIM Overlay, Grouped by Gradient



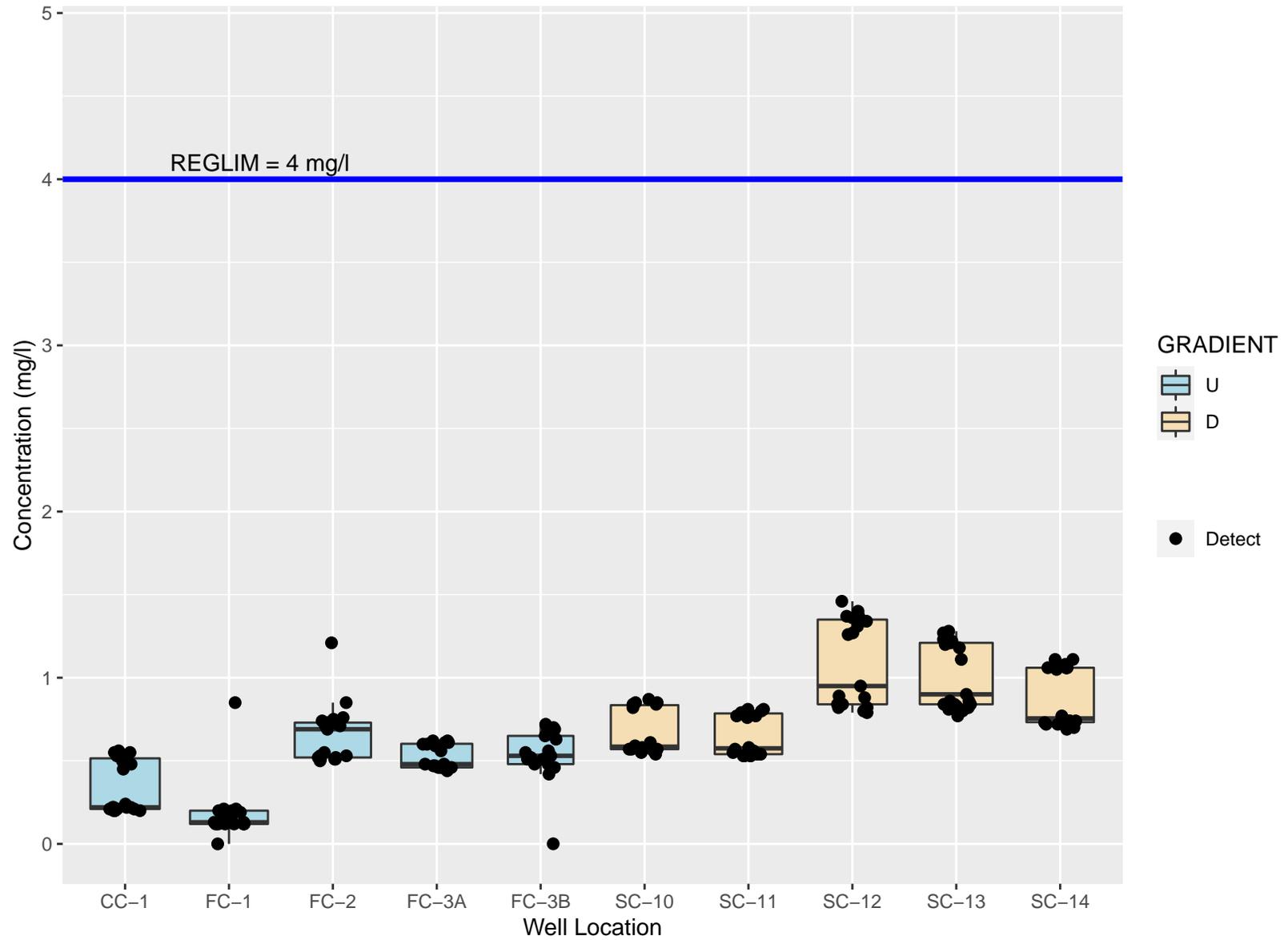
Box Plots for Chromium With REGLIM Overlay, Grouped by Gradient



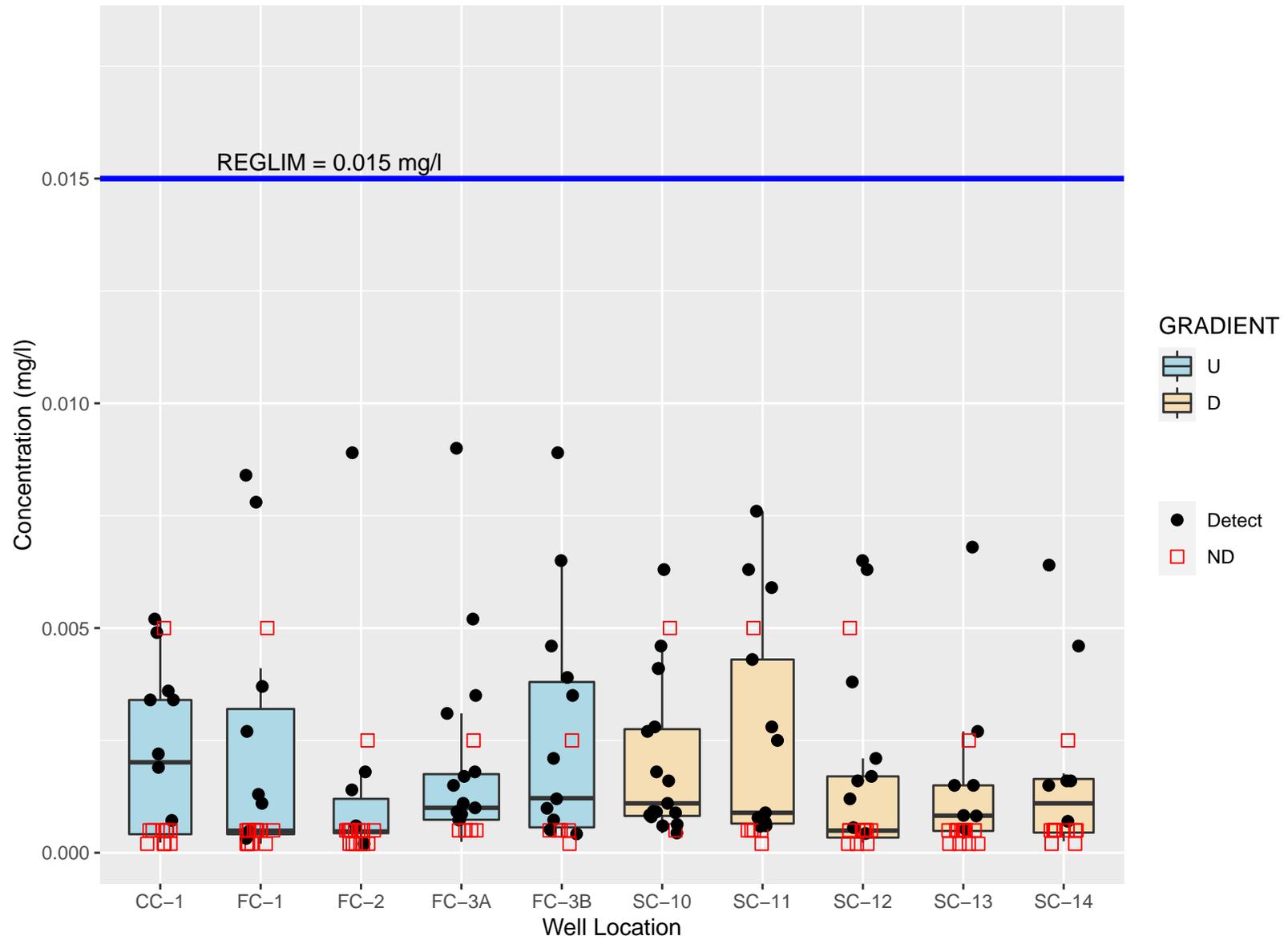
Box Plots for Cobalt With REGLIM Overlay, Grouped by Gradient



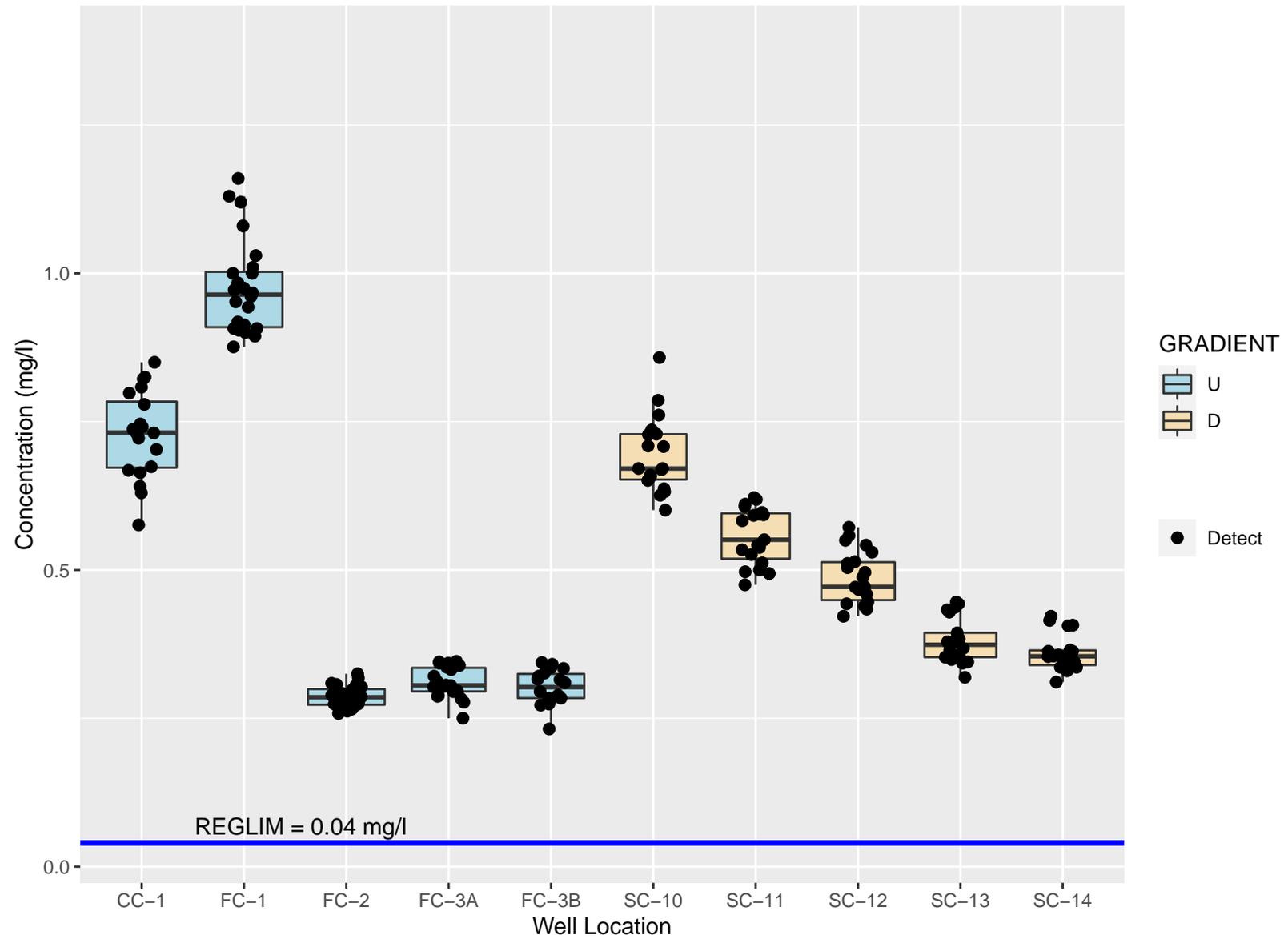
Box Plots for Fluoride With REGLIM Overlay, Grouped by Gradient



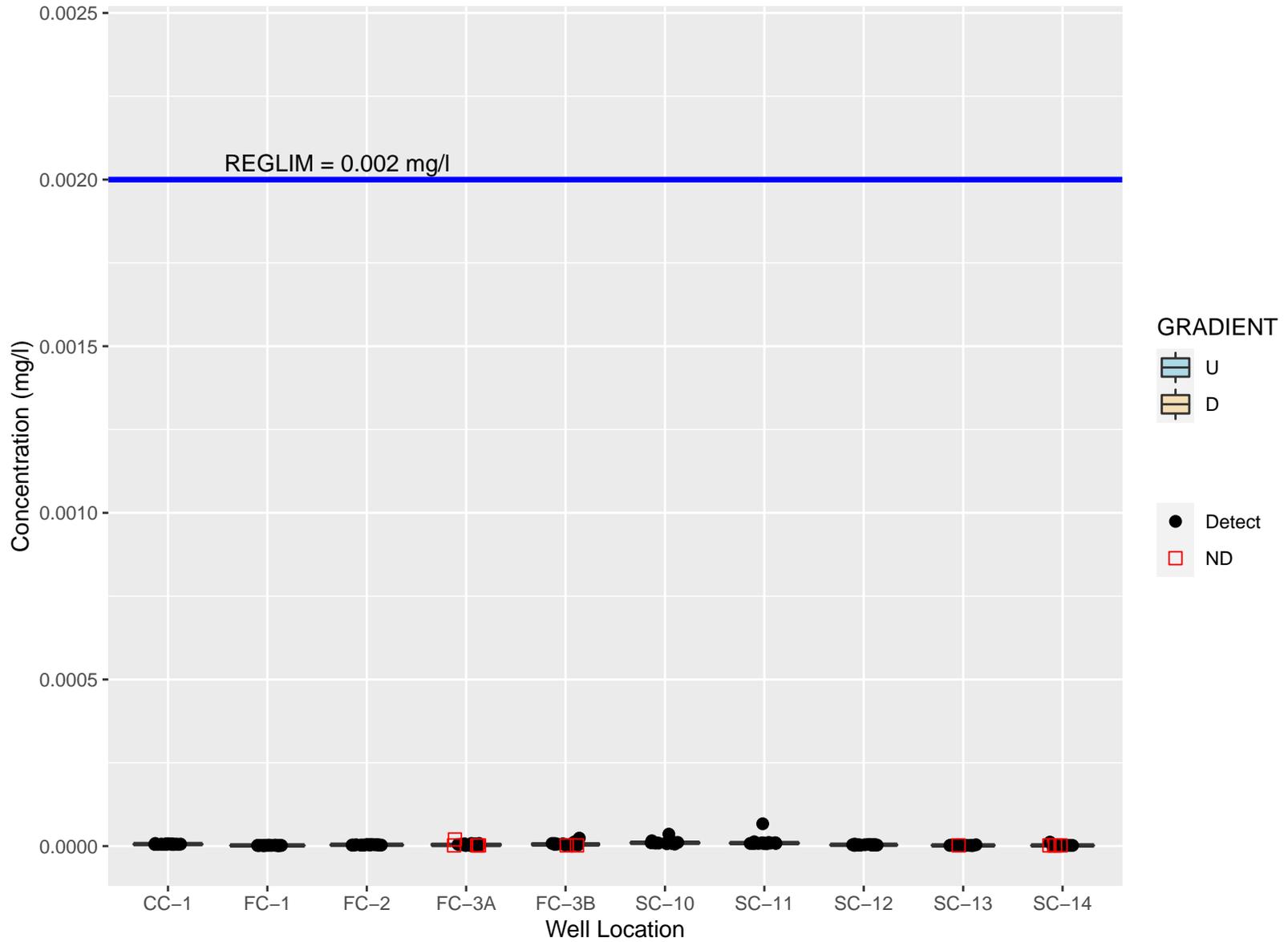
Box Plots for Lead With REGLIM Overlay, Grouped by Gradient



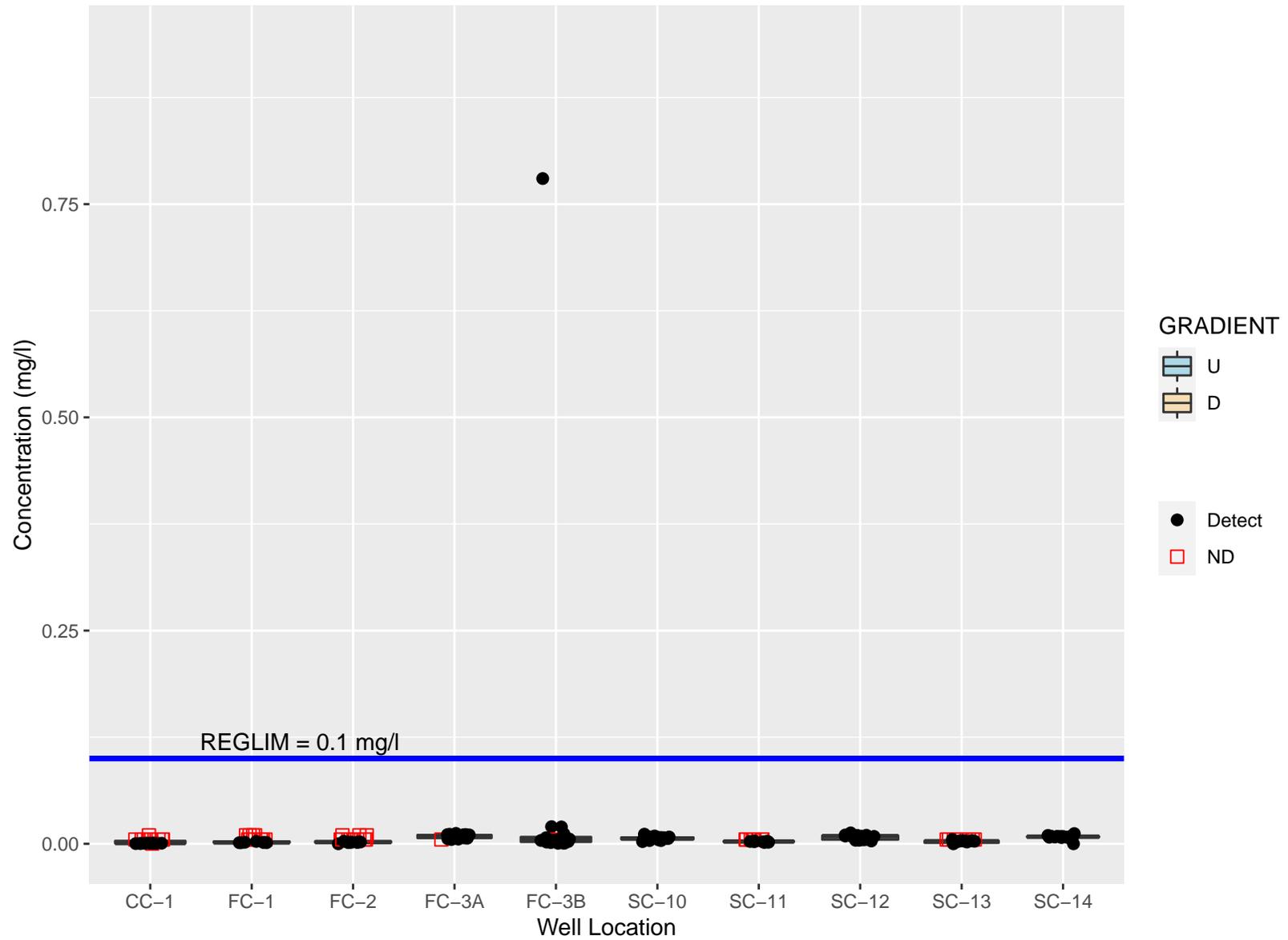
Box Plots for Lithium With REGLIM Overlay, Grouped by Gradient



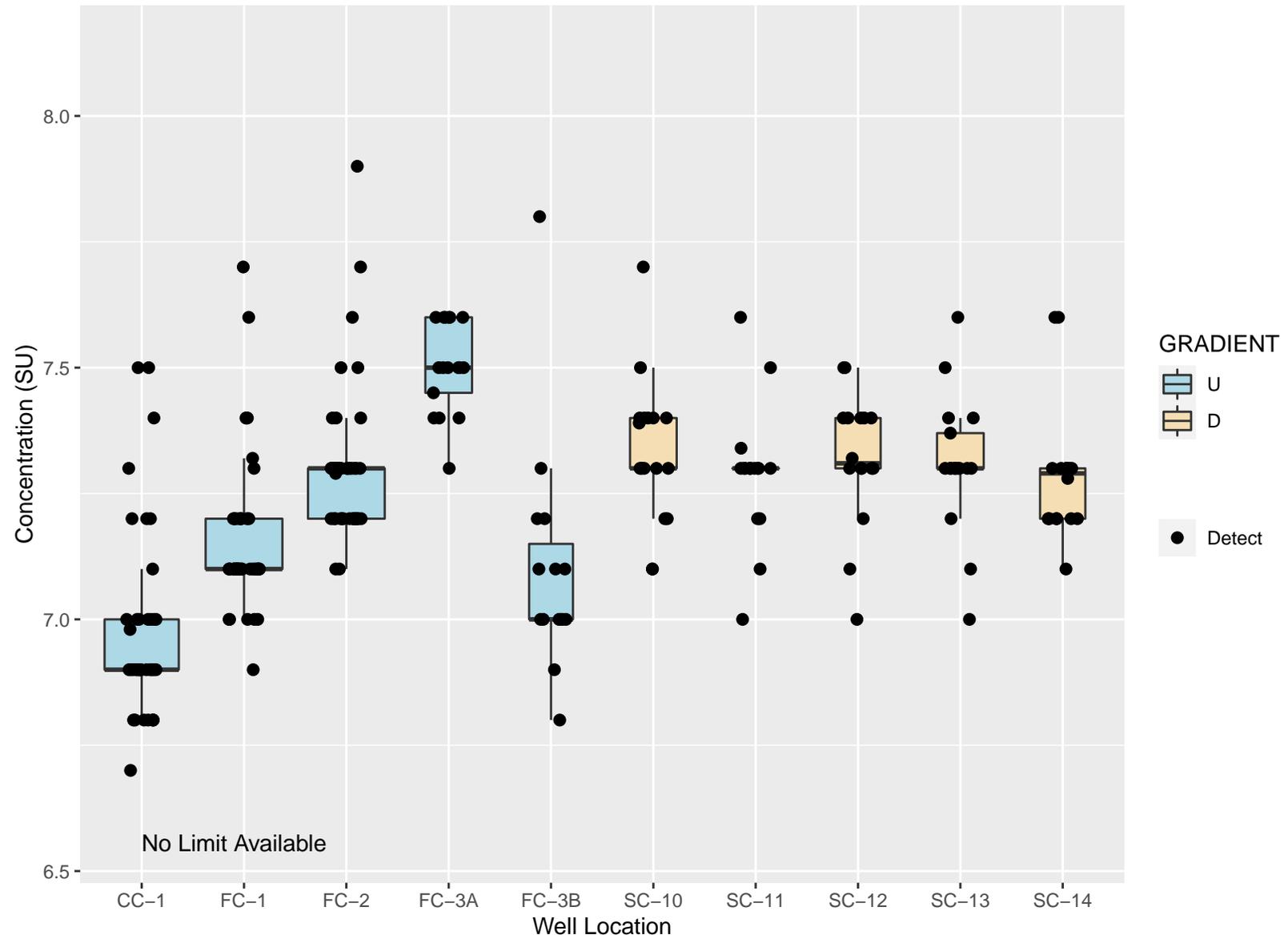
Box Plots for Mercury With REGLIM Overlay, Grouped by Gradient



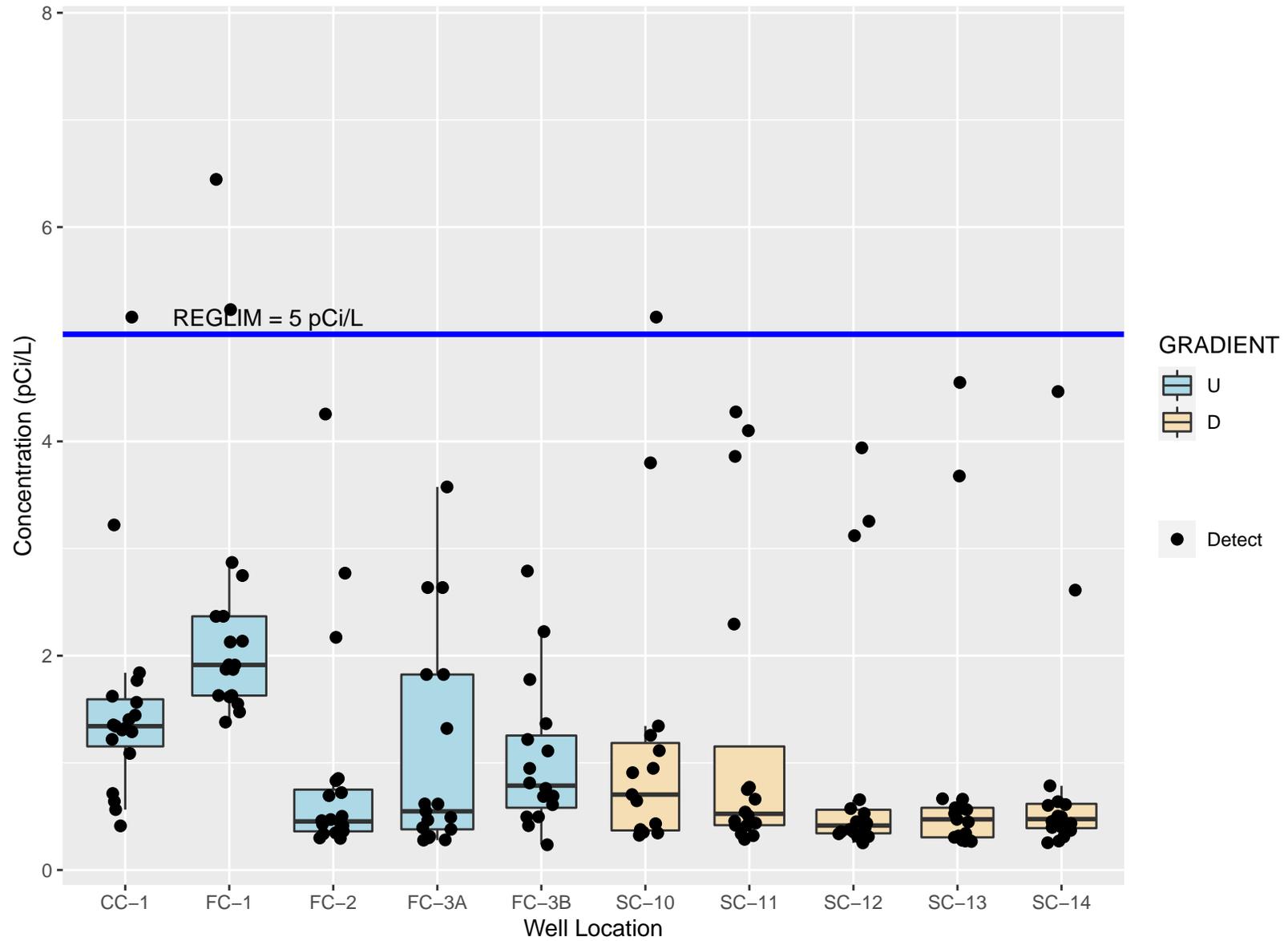
Box Plots for Molybdenum With REGLIM Overlay, Grouped by Gradient



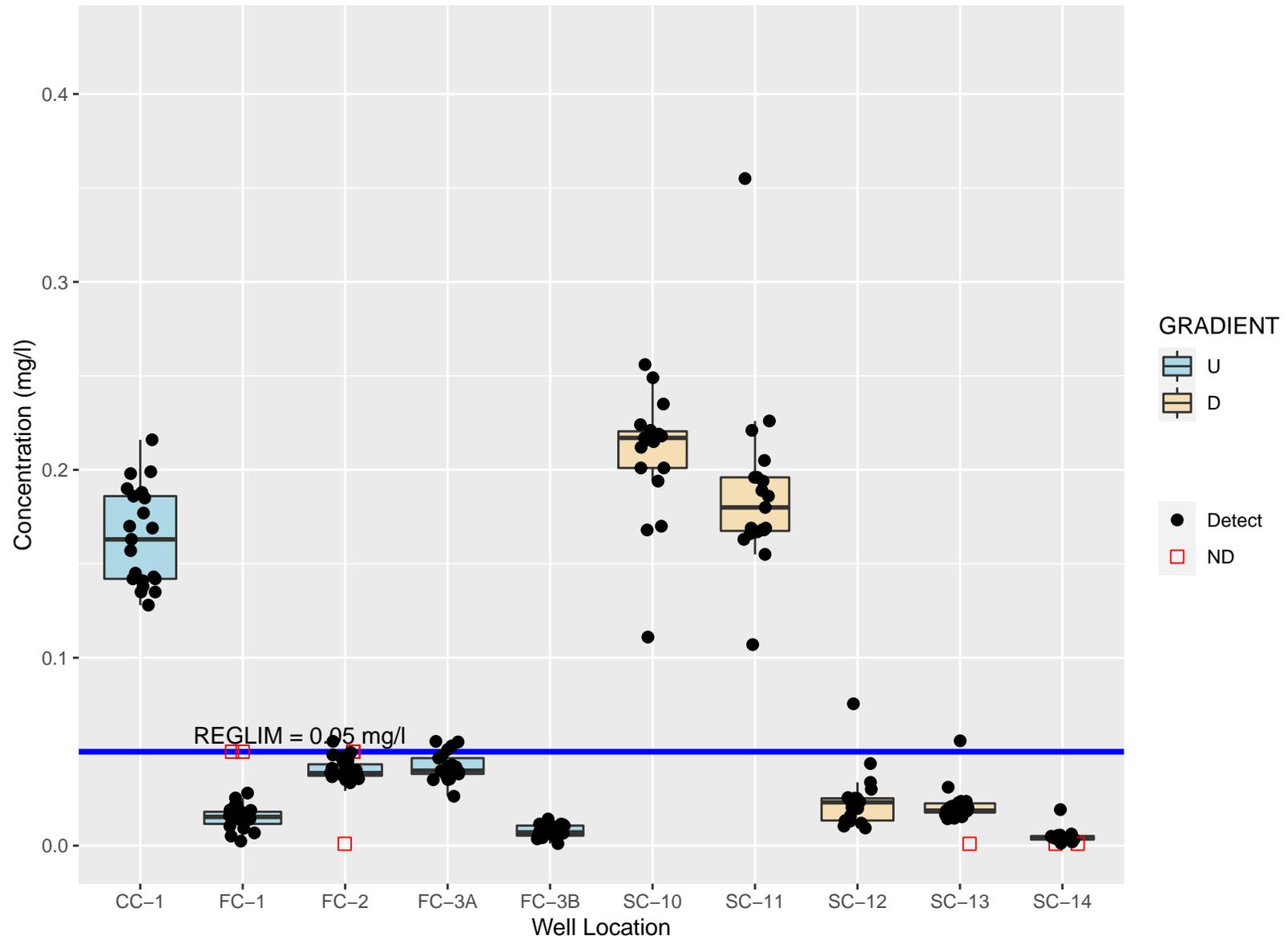
Box Plots for pH With REGLIM Overlay, Grouped by Gradient



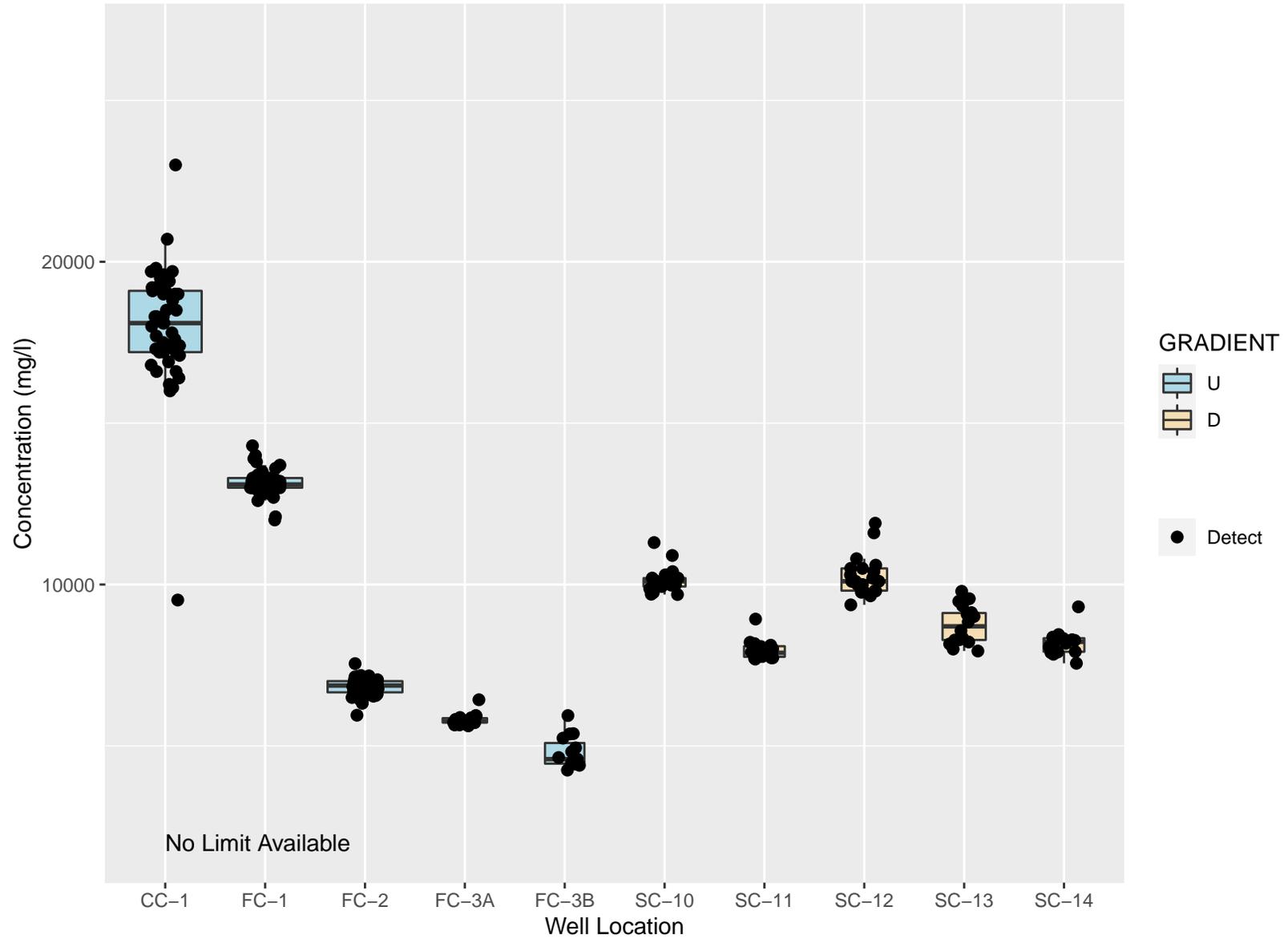
Box Plots for Rad226+228 With REGLIM Overlay, Grouped by Gradient



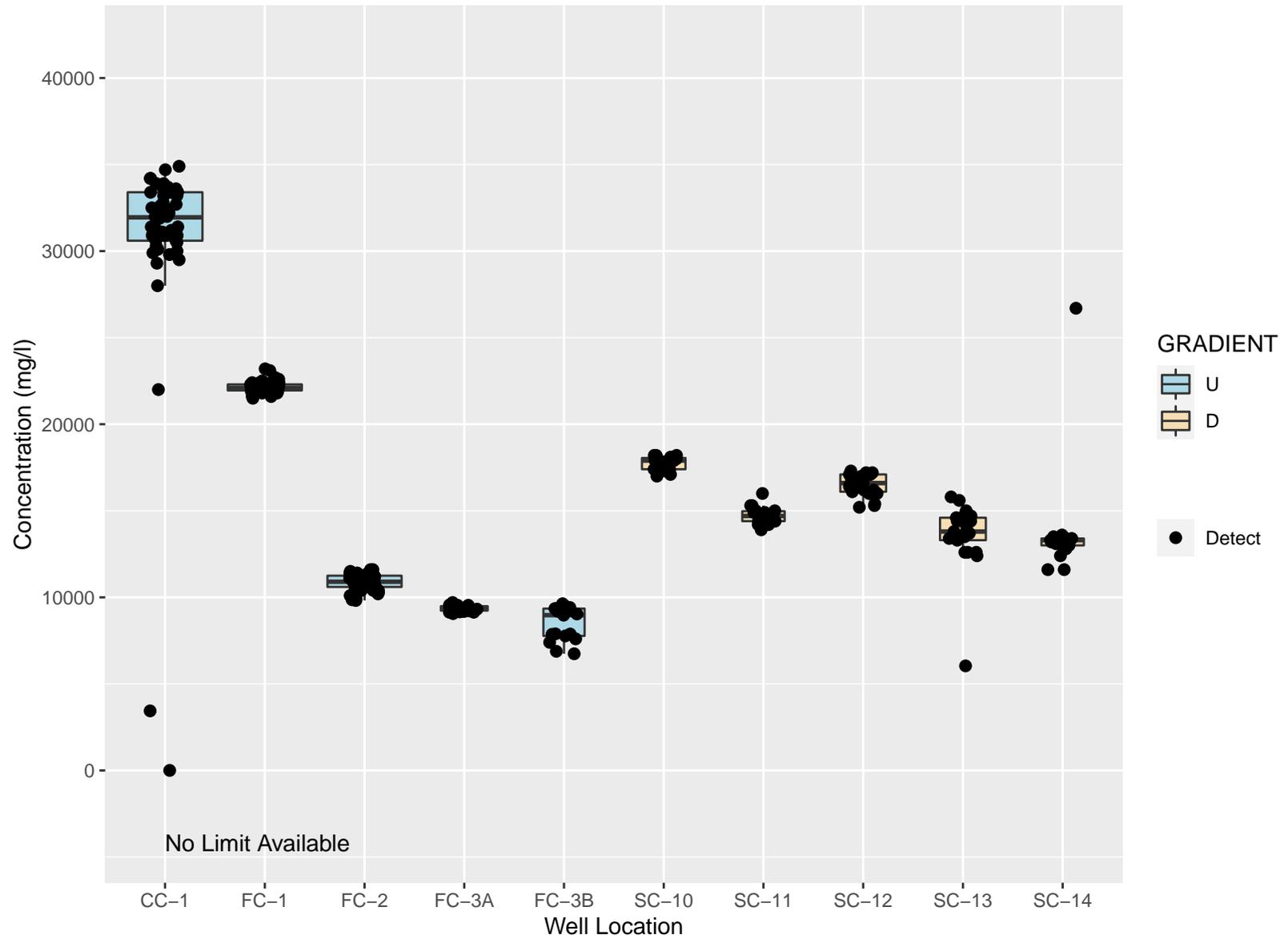
Box Plots for Selenium With REGLIM Overlay, Grouped by Gradient



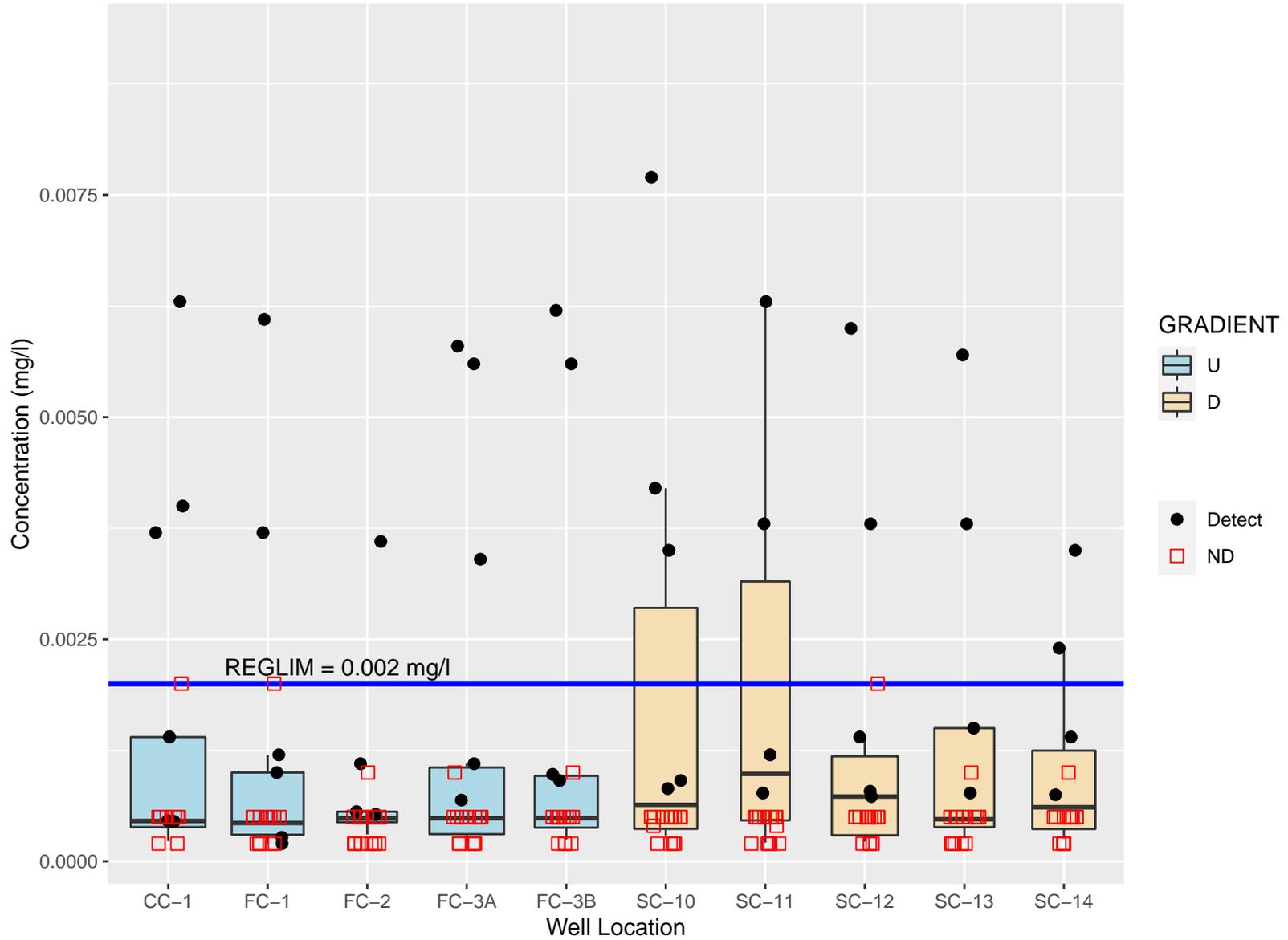
Box Plots for Sulfate With REGLIM Overlay, Grouped by Gradient



Box Plots for TDS With REGLIM Overlay, Grouped by Gradient



Box Plots for Thallium With REGLIM Overlay, Grouped by Gradient

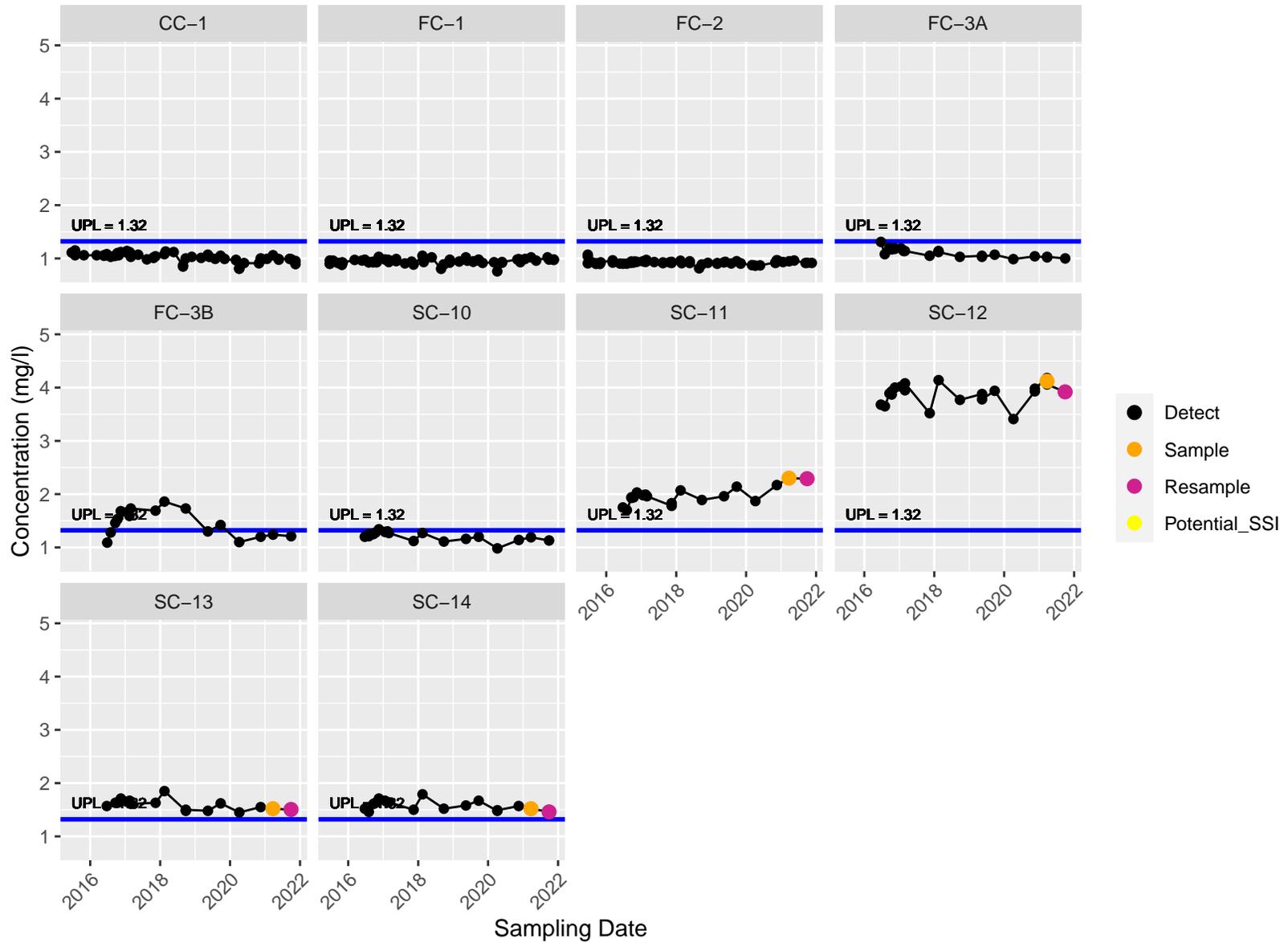


Appendix C: Supporting Graphics

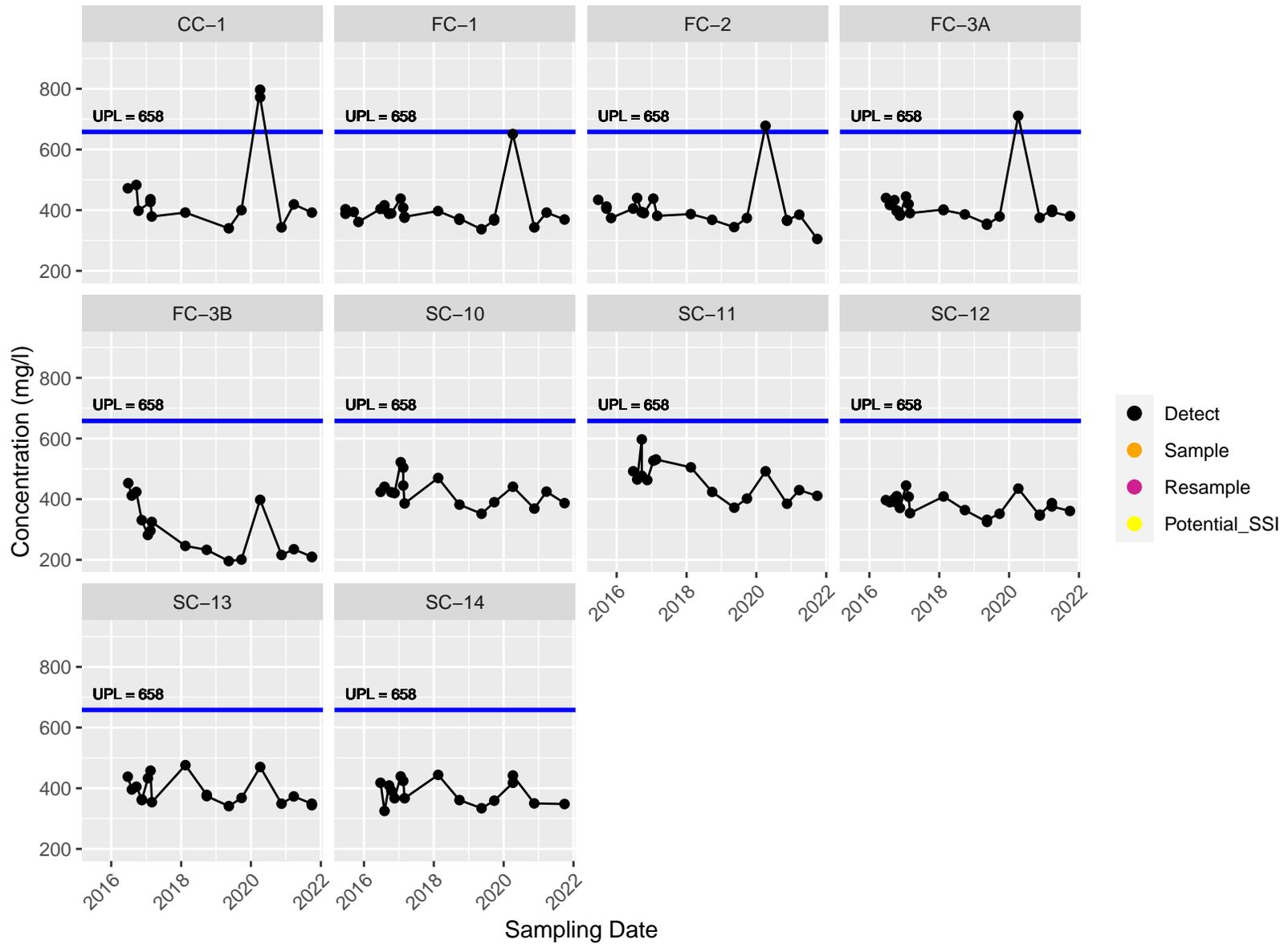
1. Appendix III Prediction Limit Outcome Plots
2. Confidence Interval Band Plots for Appendix IV Parameters

Prediction Limit Outcome Plots, Appendix III Parameters

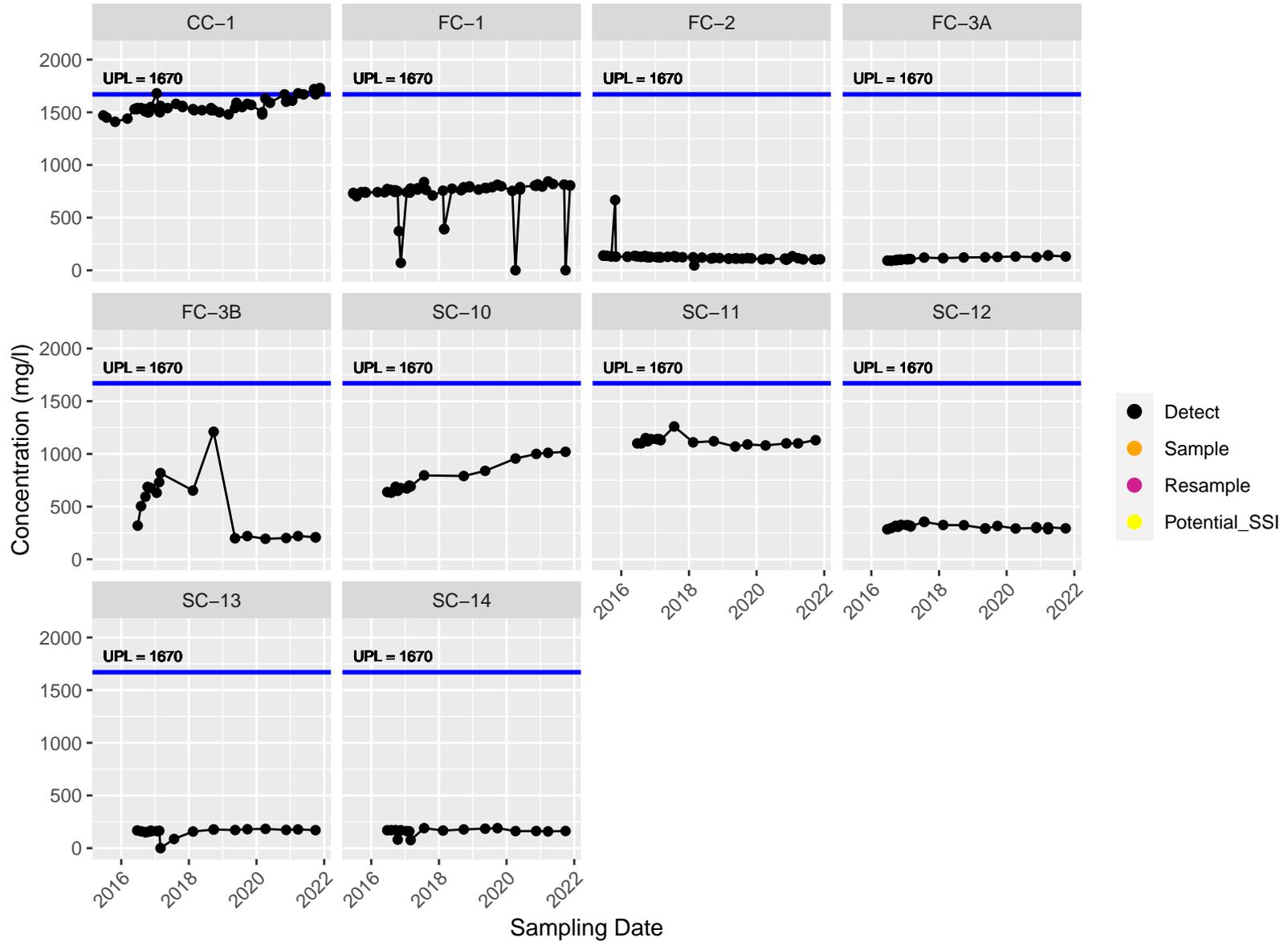
2021 Interwell Robust Prediction Limit SSIs for Boron using Grouped BG



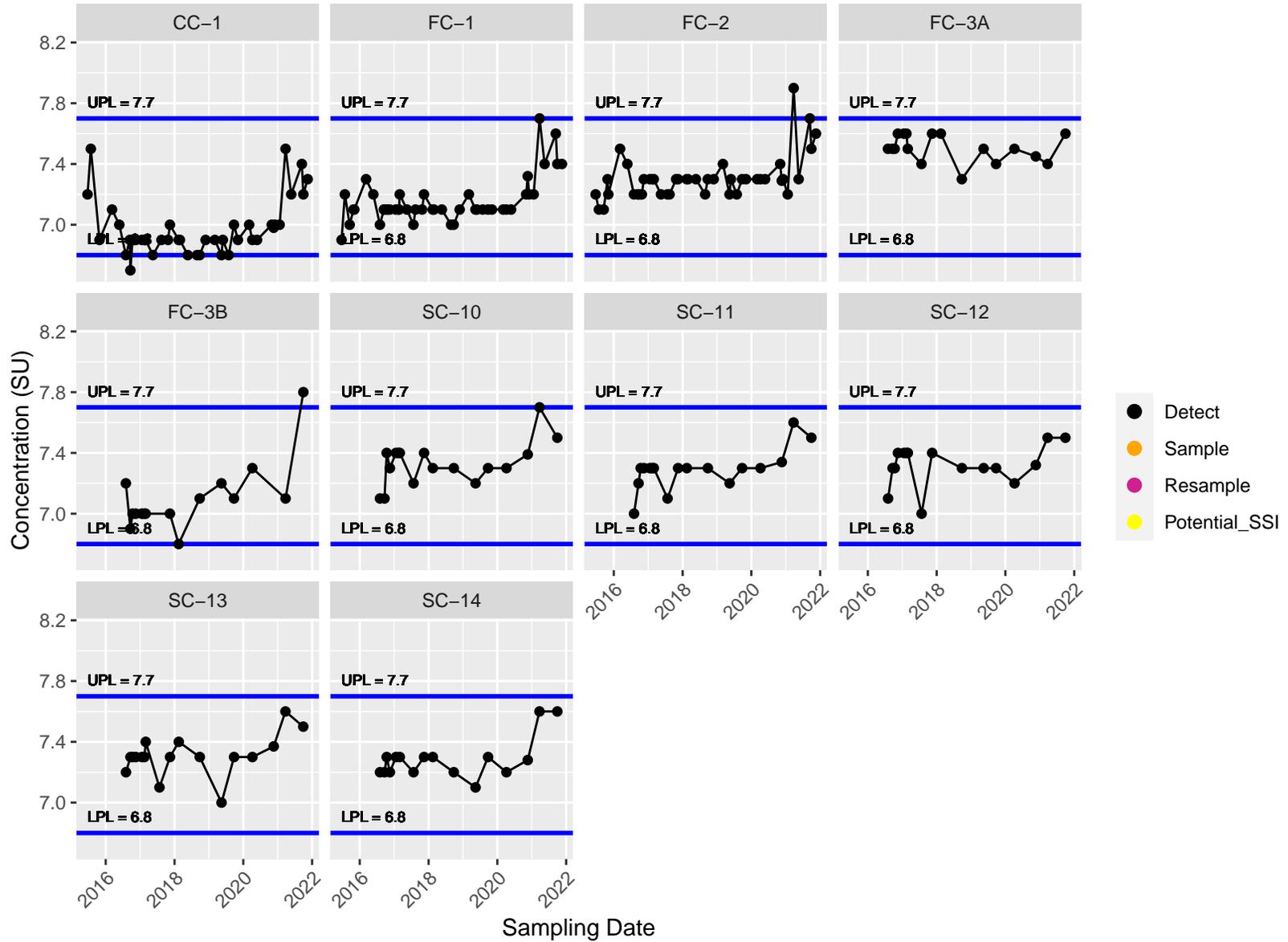
2021 Interwell Robust Prediction Limit SSIs for Calcium using Grouped BG



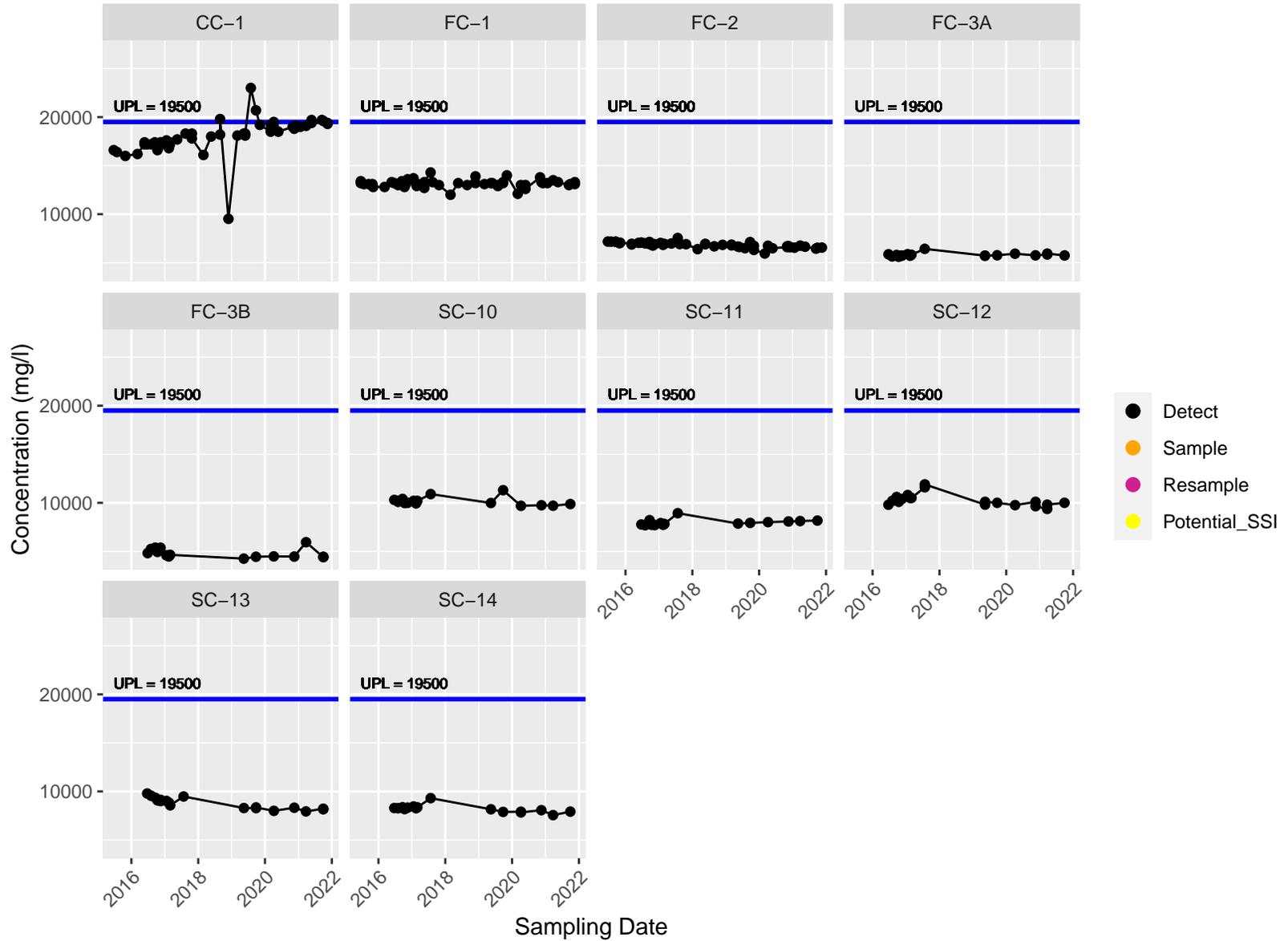
2021 Interwell Robust Prediction Limit SSIs for Chloride using Grouped BG



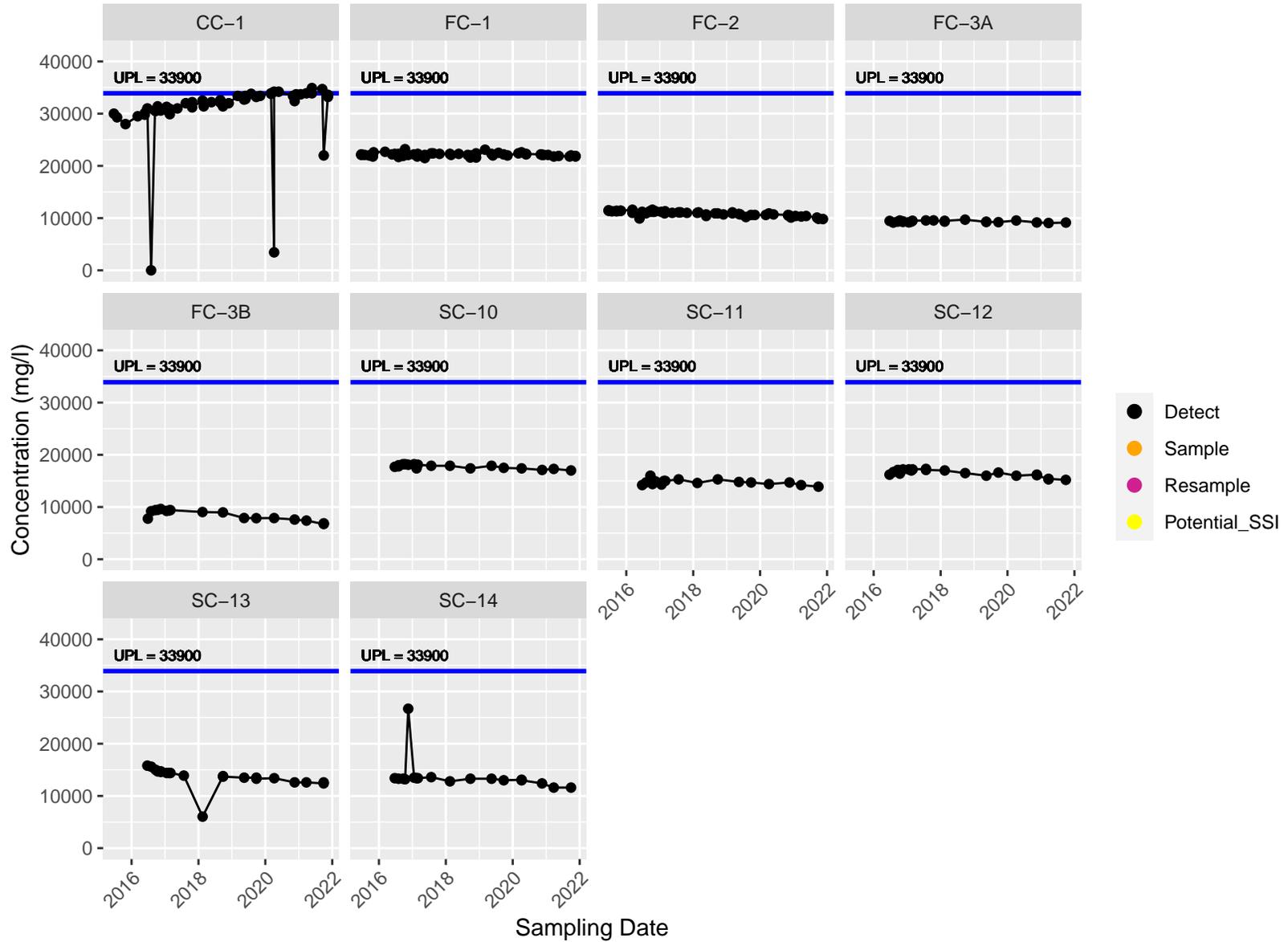
2021 Interwell Robust Prediction Limit SSIs for pH using Grouped BG



2021 Interwell Robust Prediction Limit SSIs for Sulfate using Grouped BG

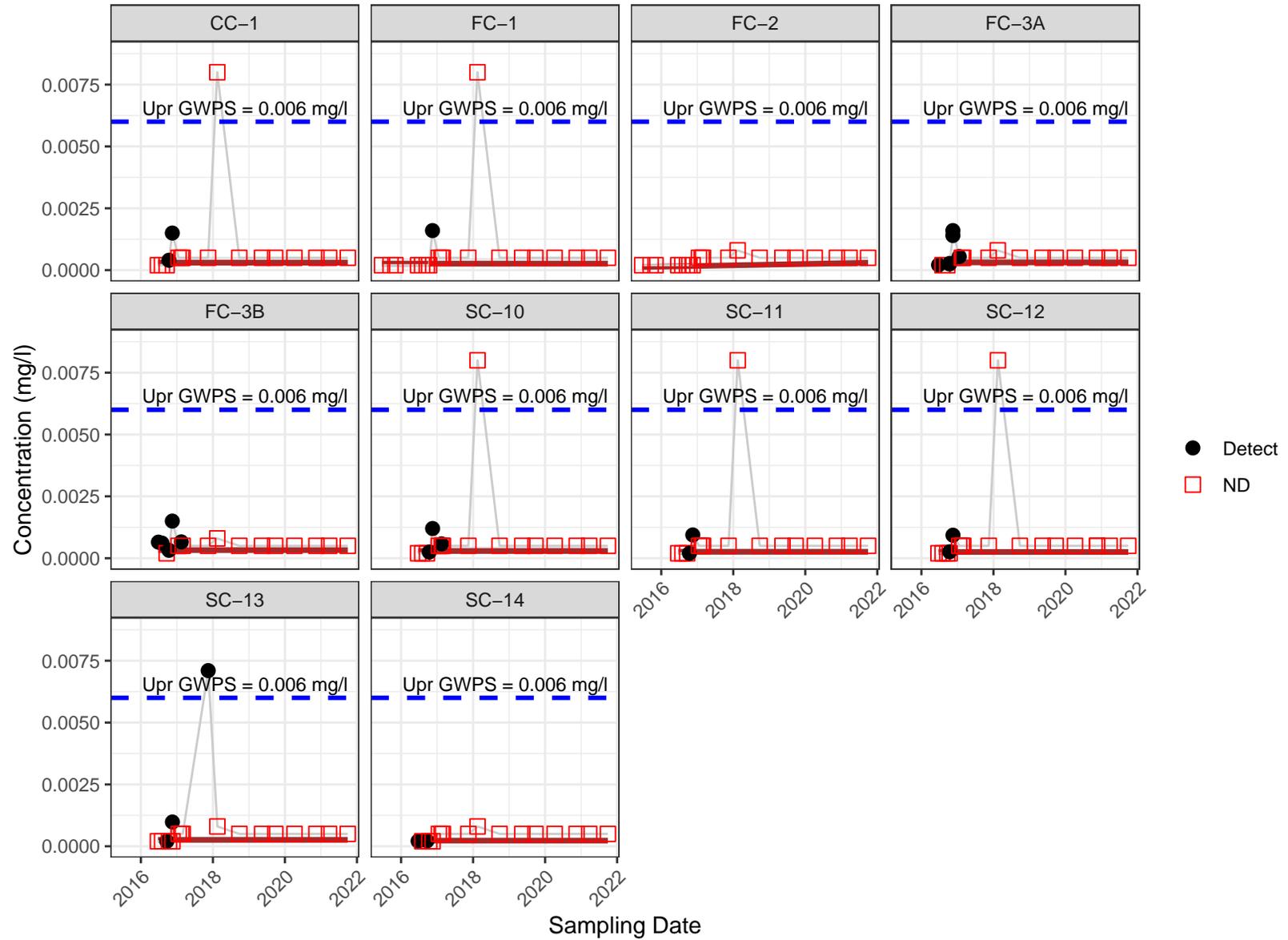


2021 Interwell Robust Prediction Limit SSIs for TDS using Grouped BG

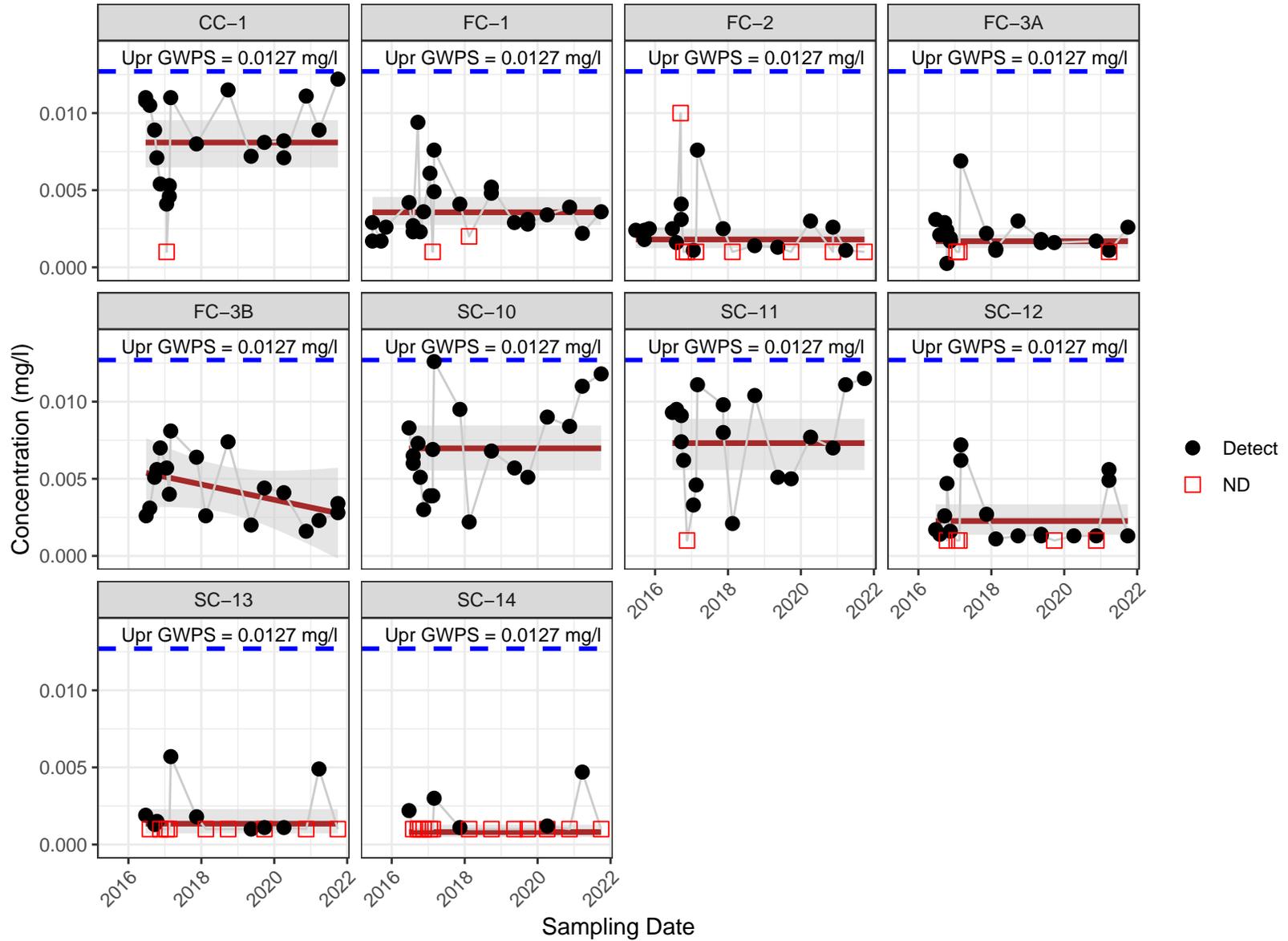


Confidence Interval Band Plots, Appendix IV Parameters

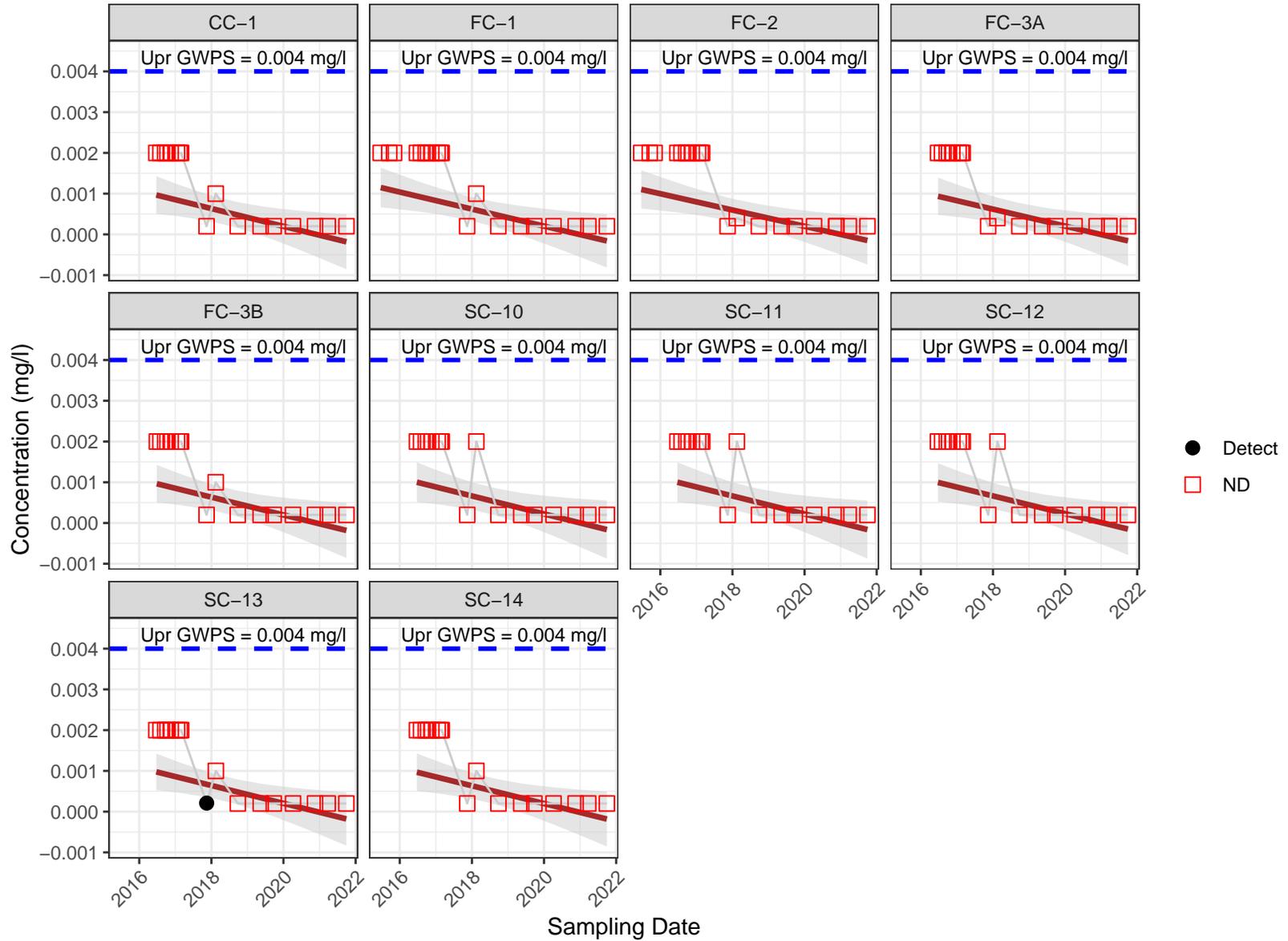
Confidence Bands for Antimony: Target One-Sided 99% Confidence



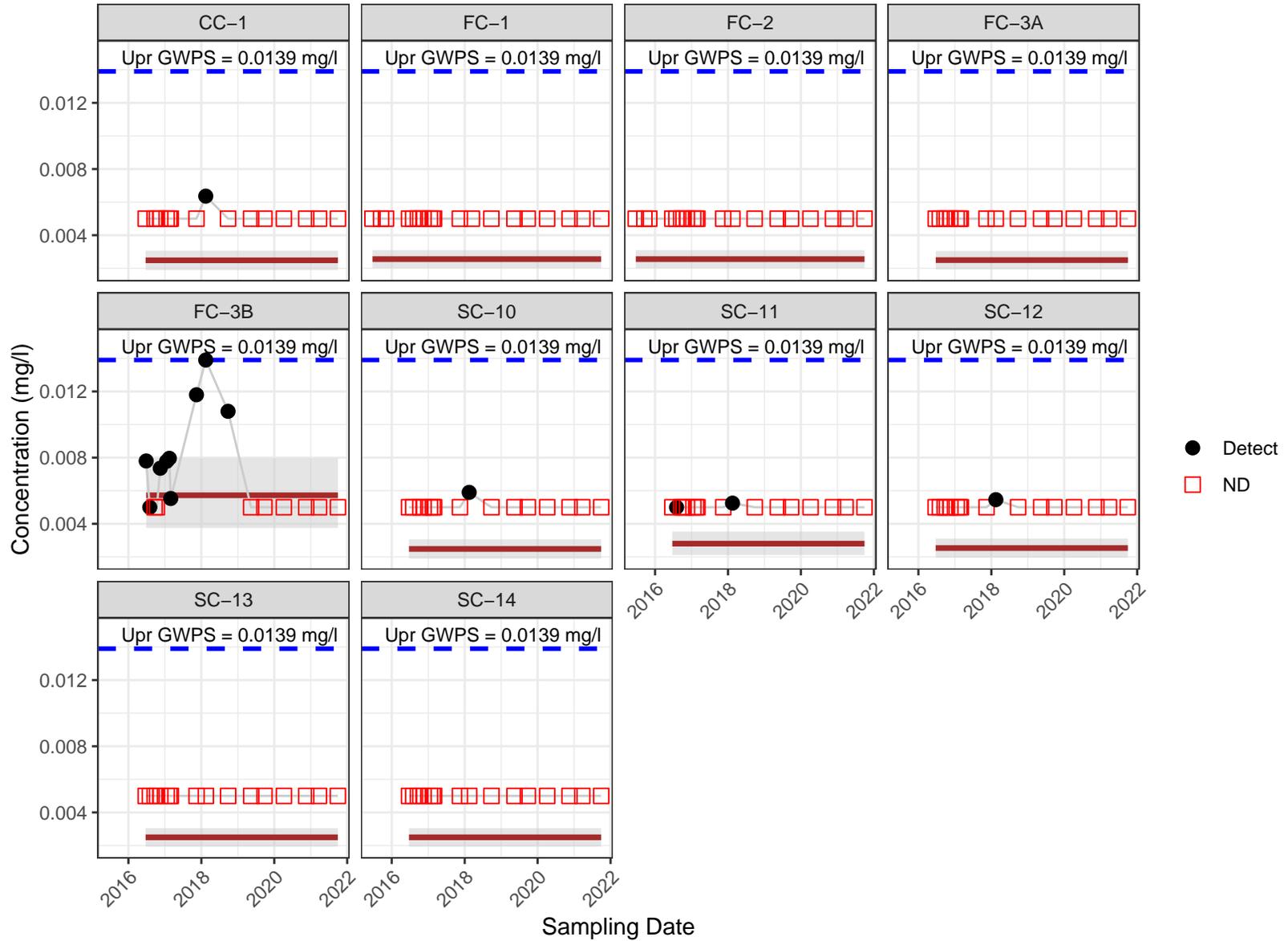
Confidence Bands for Arsenic: Target One-Sided 99% Confidence



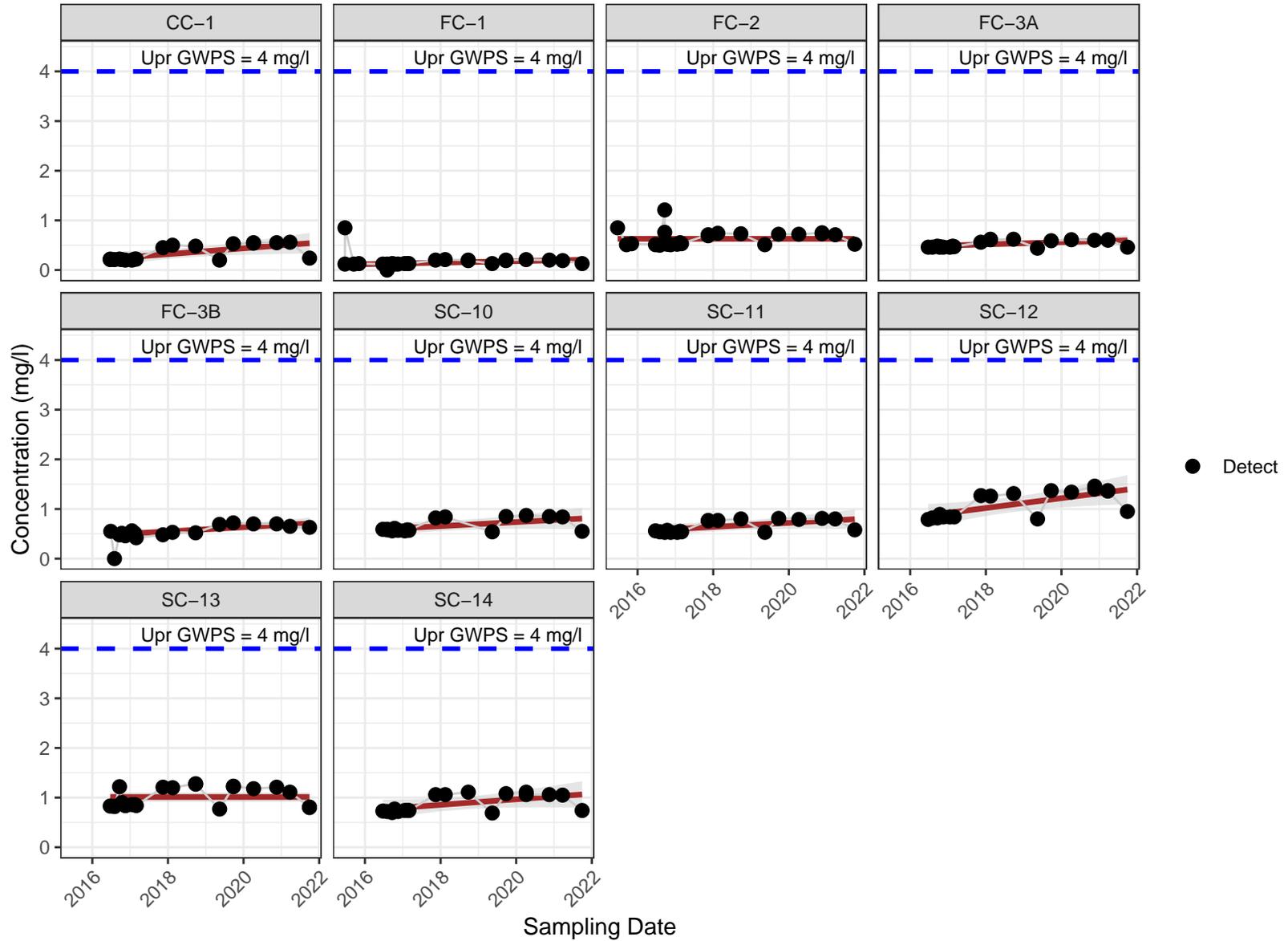
Confidence Bands for Beryllium: Target One-Sided 99% Confidence



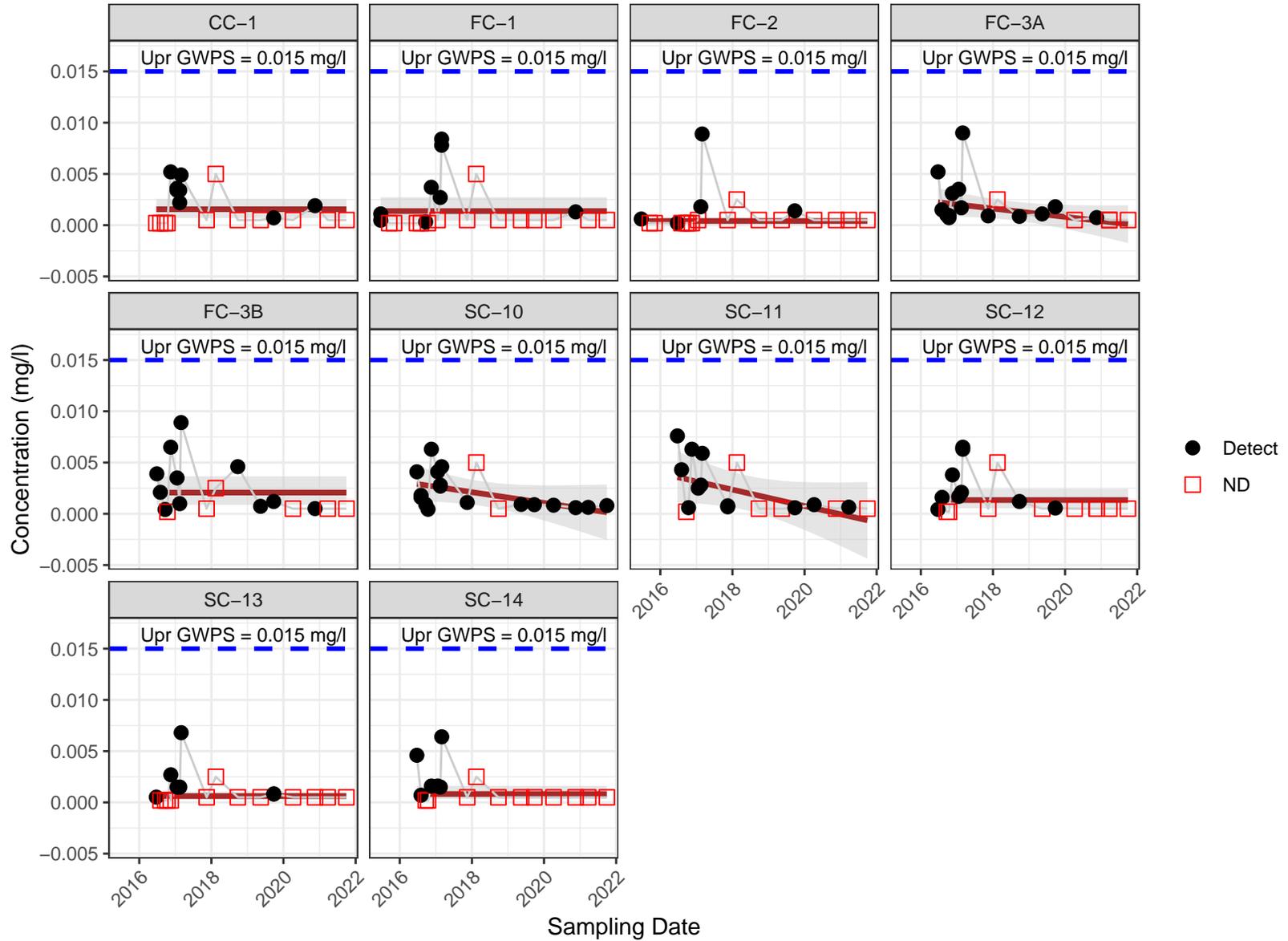
Confidence Bands for Cobalt: Target One-Sided 99% Confidence



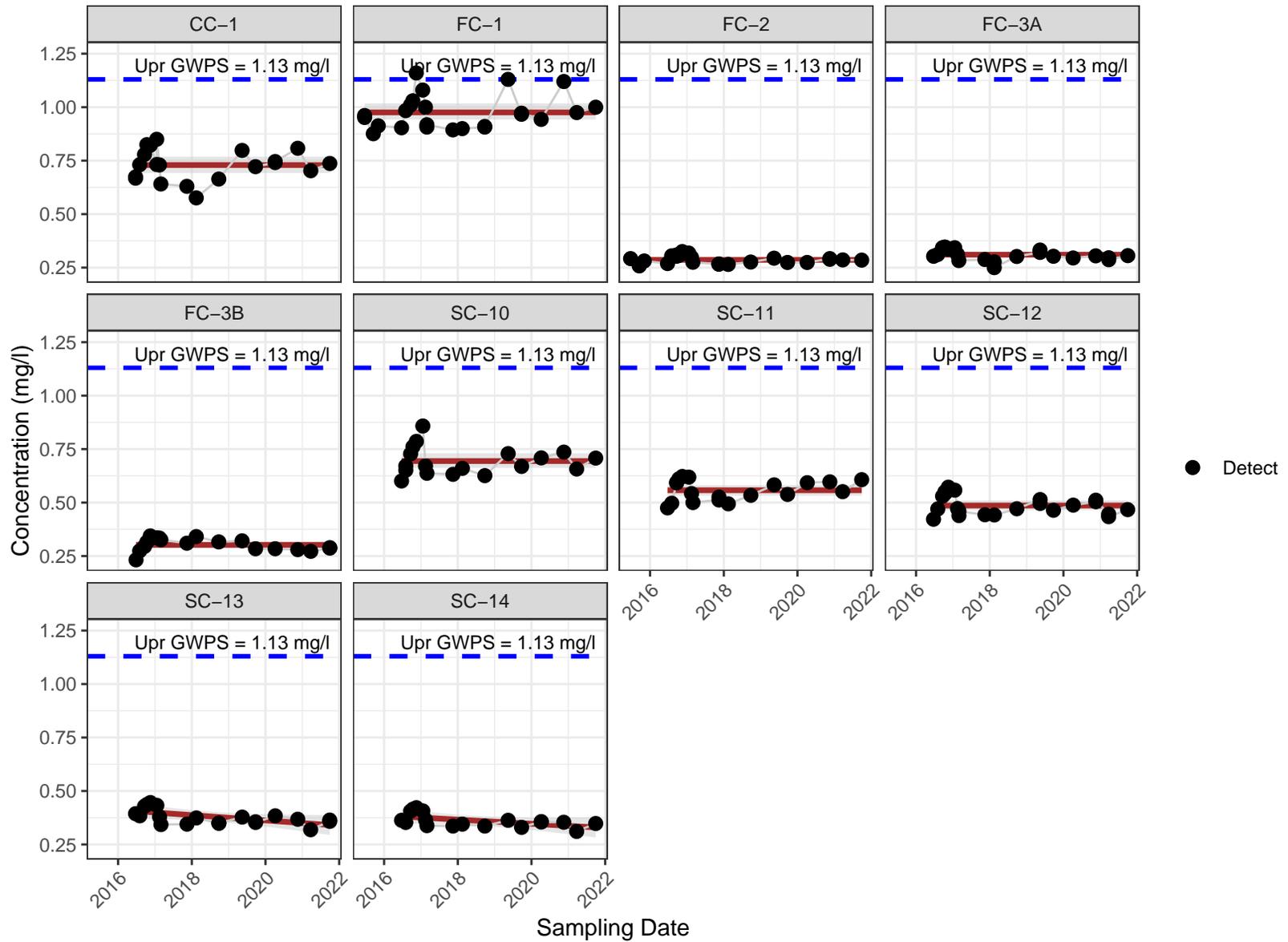
Confidence Bands for Fluoride: Target One-Sided 99% Confidence



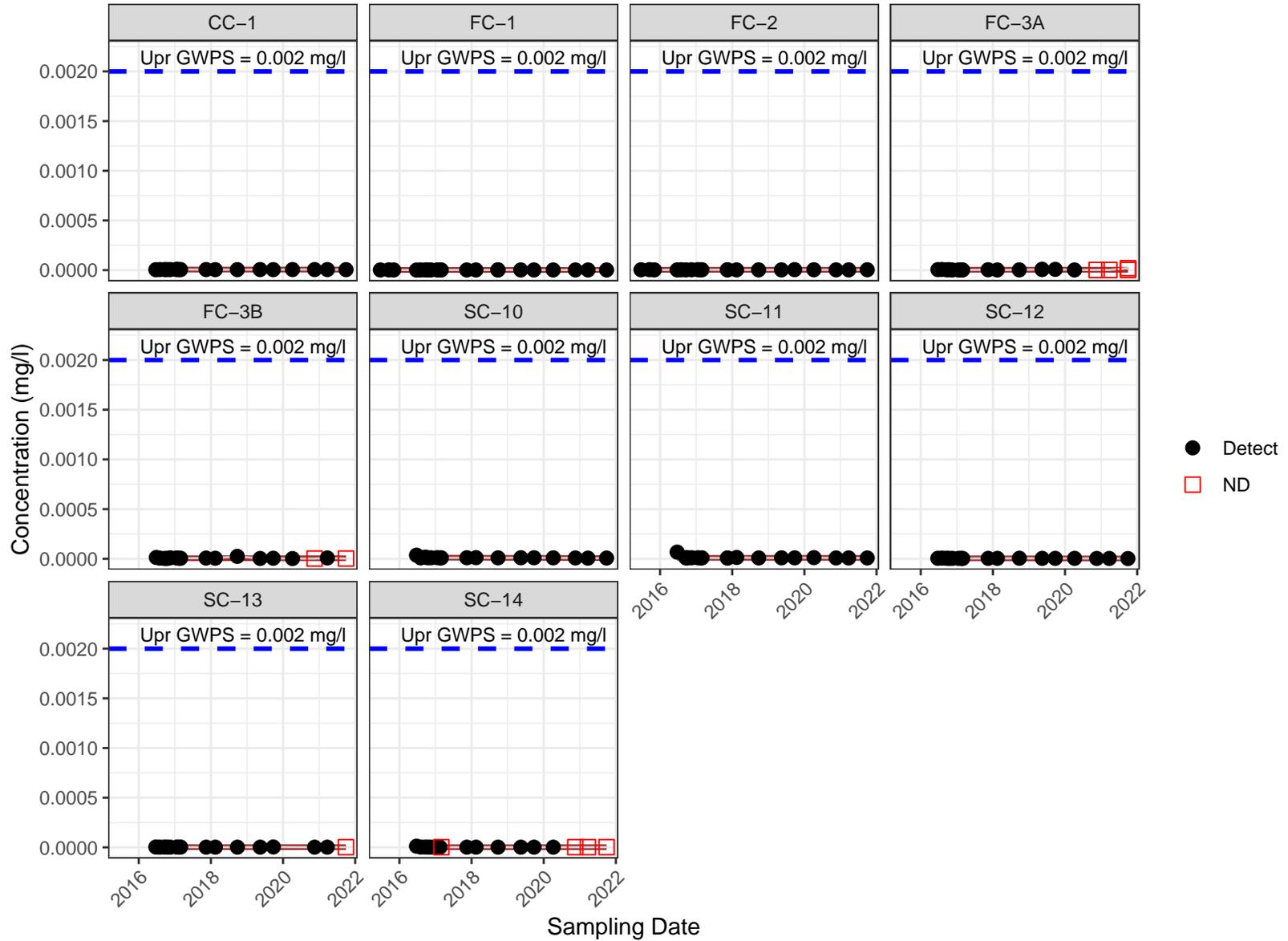
Confidence Bands for Lead: Target One-Sided 99% Confidence



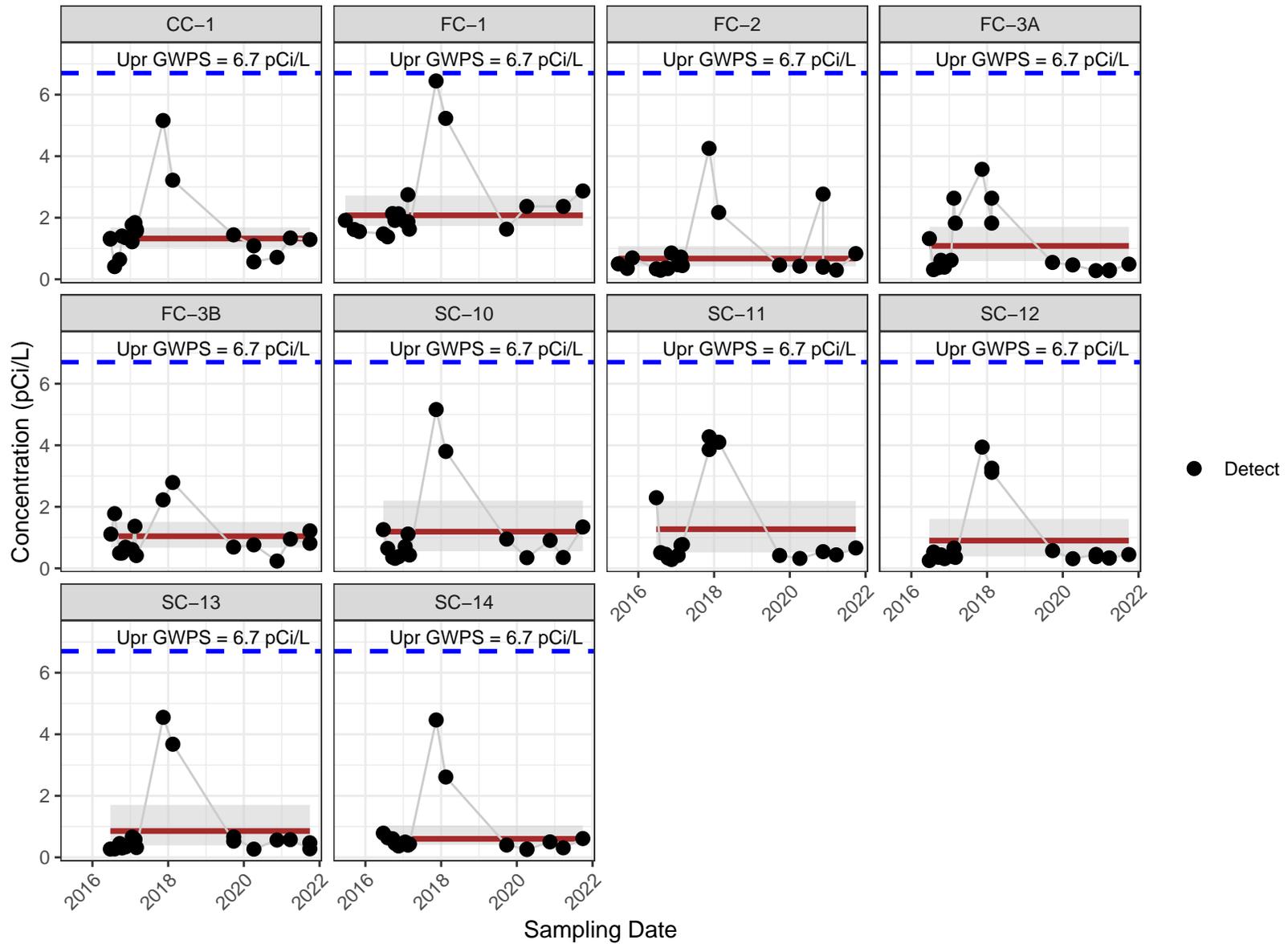
Confidence Bands for Lithium: Target One-Sided 99% Confidence



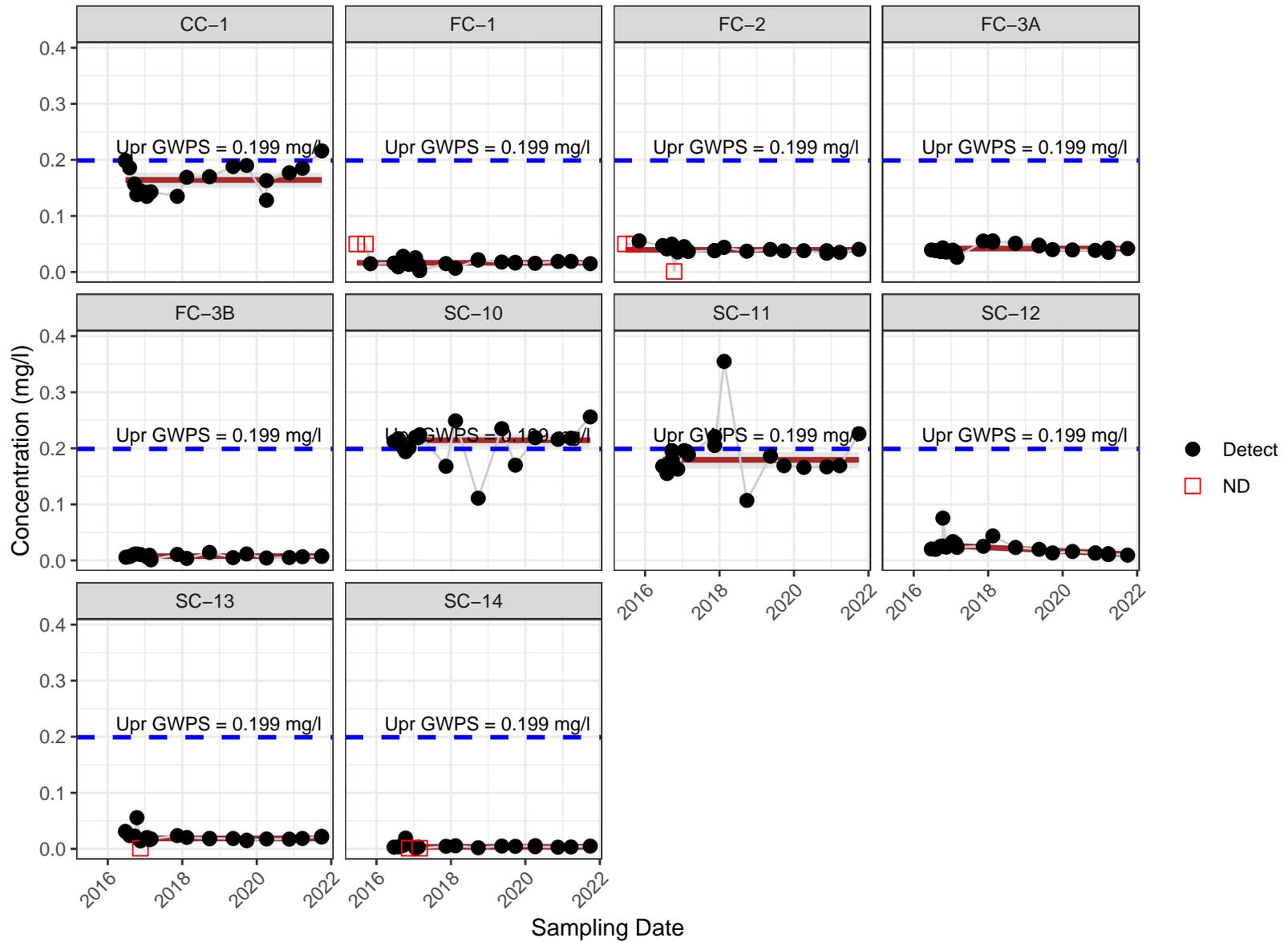
Confidence Bands for Mercury: Target One-Sided 99% Confidence



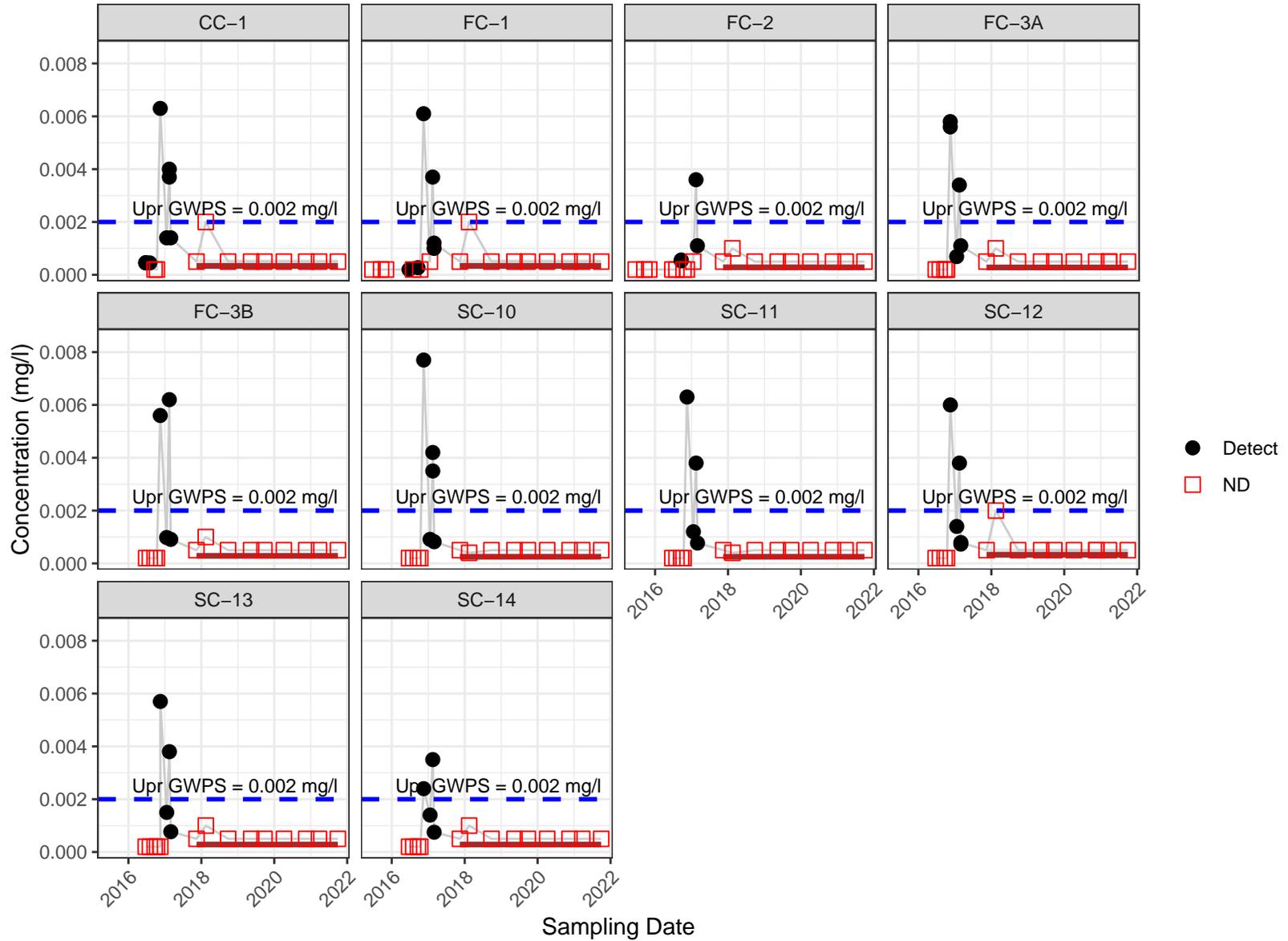
Confidence Bands for Rad226+228: Target One-Sided 99% Confidence



Confidence Bands for Selenium: Target One-Sided 99% Confidence



Confidence Bands for Thallium: Target One-Sided 99% Confidence



APPENDIX C

Groundwater Sample Analytical Results and Groundwater Depths / Elevations

CCR LANDFILL
Analytical Results of Groundwater Samples (2021)
Constituents - Antimony to Fluoride

Monitoring Well ID	Well Purpose	Sample Date	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/l)	Boron (mg/l)	Cadmium (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Fluoride (mg/l)
CC-1	Upgradient	03/25/2021	<0.0005	0.0089	0.0041	<0.0002	1.06	<0.0005	419	1680	0.0029	<0.005	0.56
		09/30/2021	<0.0005	0.0122	0.0026	<0.0002	0.985	<0.0005	392	1670	<0.001	<0.005	0.24
FC-1	Upgradient	03/25/2021	<0.0005	0.0022	0.0133	<0.0002	1.02	<0.0005	392	844	0.0027	<0.005	0.19
		09/29/2021	<0.0005	0.0036	0.0059	<0.0002	0.979	<0.0005	369	809	<0.001	<0.005	0.13
FC-2	Upgradient	03/25/2021	<0.0005	0.0011	0.0053	<0.0002	0.947	<0.0005	385	115	0.0066	<0.005	0.71
		09/29/2021	<0.0005	<0.001	0.0046	<0.0002	0.918	<0.0005	305	102	<0.001	<0.005	0.52
FC-3A	Upgradient	03/25/2021	<0.0005	0.0011	0.0088	<0.0002	1.02	<0.0005	394	141	0.0037	<0.005	0.6
		03/25/2021 Duplicate	<0.0005	<0.001	0.0083	<0.0002	1.03	<0.0005	401	142	0.0033	<0.005	0.61
		09/30/2021	<0.0005	0.0026	0.0111	<0.0002	1	<0.0005	380	131	<0.001	<0.005	0.46
FC-3B	Upgradient	03/25/2021	<0.0005	0.0023	0.0112	<0.0002	1.24	<0.0005	235	220	0.0044	<0.005	0.65
		09/30/2021	<0.0005	0.0034	0.0053	<0.0002	1.21	<0.0005	209	207	<0.001	<0.005	0.63
		09/30/2021 Duplicate	<0.0005	0.0028	0.0077	<0.0002	1.21	<0.0005	210	209	<0.001	<0.005	0.63
SC-10	Downgradient	03/24/2021	<0.0005	0.011	0.0111	<0.0002	1.19	<0.0005	425	1010	0.001	<0.005	0.84
		09/29/2021	<0.0005	0.0118	0.0116	<0.0002	1.13	<0.0005	387	1020	<0.001	<0.005	0.55
SC-11	Downgradient	03/24/2021	<0.0005	0.0111	0.0121	<0.0002	2.3	<0.0005	430	1100	0.0017	<0.005	0.8
		09/29/2021	<0.0005	0.0115	0.0064	<0.0002	2.29	<0.0005	411	1130	<0.001	<0.005	0.58
SC-12	Downgradient	03/24/2021	<0.0005	0.0056	0.0057	<0.0002	4.06	<0.0005	376	285	0.0021	<0.005	1.37
		03/24/2021 Duplicate	<0.0005	0.0049	0.0052	<0.0002	4.18	<0.0005	387	303	0.0018	<0.005	1.36
		09/29/2021	<0.0005	0.0013	0.0084	<0.0002	3.92	<0.0005	361	293	<0.001	<0.005	0.95
SC-13	Downgradient	03/24/2021	<0.0005	0.0049	0.0045	<0.0002	1.52	<0.0005	373	178	0.0011	<0.005	1.11
		09/29/2021	<0.0005	<0.001	0.0042	<0.0002	1.51	<0.0005	344	171	<0.001	<0.005	0.8
		09/29/2021 Duplicate	<0.0005	<0.001	0.0036	<0.0002	1.5	<0.0005	349	171	<0.001	<0.005	0.81
SC-14	Cross-Gradient	03/24/2021	<0.0005	0.0047	0.0045	<0.0002	1.52	<0.0005	374	159	0.0015	<0.005	1.05
		09/29/2021	<0.0005	<0.001	0.0037	<0.0002	1.46	<0.0005	348	163	<0.001	<0.005	0.74

Notes:

- All samples collected for both detection monitoring and assessment monitoring
- Metals are Total Recoverable
- See laboratory reports for data qualifiers
- < Indicates that the compound was not detected above the stated laboratory reporting limit
- TDS = Total Dissolved Solids

CCR LANDFILL
Analytical Results of Groundwater Samples (2021)
Constituents – Lead to TDS

Monitoring Well ID	Well Purpose	Sample Date	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/l)	pH	Radium 226 (pCi/l)	Radium 228 (pCi/l)	Selenium (mg/l)	Sulfate (mg/l)	Thallium (mg/l)	TDS
CC-1	Upgradient	03/25/2021	<0.0005	0.703	0.000006	0.00058	7.5	0.332	1.01	0.185	19100	<0.0005	33900
		09/30/2021	<0.0005	0.737	0.000005	0.00037	7.2	0.355	0.935	0.216	19600	<0.0005	34300
FC-1	Upgradient	03/25/2021	<0.0005	0.975	0.000002	0.0028	7.7	0.517	1.85	0.019	13500	<0.0005	21800
		09/29/2021	<0.0005	1	0.000002	0.0012	7.4	1.02	1.85	0.0149	13100	<0.0005	22000
FC-2	Upgradient	03/25/2021	<0.0005	0.286	0.000003	0.0019	7.9	0.517	0.299	0.035	6760	<0.0005	10300
		09/29/2021	<0.0005	0.285	0.000004	0.0016	7.5	1.02	0.834	0.0404	6540	<0.0005	9860
FC-3A	Upgradient	03/25/2021	<0.0005	0.287	<0.000002	0.0058	7.4	<0.151	<0.406	0.0351	5940	<0.0005	9060
		03/25/2021 Duplicate	<0.0005	0.296	<0.000002	0.0055	7.4	<0.144	<0.459	0.0423	5850	<0.0005	9060
		09/30/2021	<0.0005	0.306	<0.000002	0.0063	7.6	<0.233	<0.75	0.0419	5750	<0.0005	9140
FC-3B	Upgradient	03/25/2021	<0.0005	0.272	0.000008	0.001	7.1	<0.141	<0.487	0.0066	5940	<0.0005	7400
		09/30/2021	<0.0005	0.289	<0.000002	0.00039	7.8	<0.207	0.709	0.0072	4440	<0.0005	6880
		09/30/2021 Duplicate	<0.0005	0.287	<0.000002	0.00078	7.8	0.427	0.791	0.0077	4400	<0.0005	6740
SC-10	Downgradient	03/24/2021	0.00063	0.657	0.000006	0.0052	7.7	<0.179	<0.525	0.218	9700	<0.0005	17300
		09/29/2021	0.0008	0.708	0.000007	0.0038	7.5	<0.758	<1.93	0.256	9870	<0.0005	17000
SC-11	Downgradient	04/07/2020	0.00065	0.551	0.000008	0.0024	7.6	<0.188	<0.687	0.169	8120	<0.0005	14200
		11/17/2020	<0.0005	0.607	0.000008	0.0019	7.5	<0.355	<0.967	0.226	8170	<0.0005	13900
SC-12	Downgradient	03/24/2021	<0.0005	0.434	0.000003	0.0047	7.5	0.123	<0.43	0.012	9370	<0.0005	15400
		03/24/2021 Duplicate	<0.0005	0.446	0.000003	0.0049	7.5	<0.122	<0.54	0.0104	9810	<0.0005	15300
		09/29/2021	<0.0005	0.467	0.000002	0.0033	7.5	<0.205	<0.69	0.0094	10000	<0.0005	15200
SC-13	Downgradient	03/24/2021	<0.0005	0.319	0.000002	0.0029	7.6	<0.127	0.512	0.0186	7940	<0.0005	12600
		09/29/2021	<0.0005	0.364	0.000002	0.0023	7.5	<0.149	<0.404	0.0224	8220	<0.0005	12400
		09/29/2021 Duplicate	<0.0005	0.358	<0.000002	0.0021	7.5	0.257	<0.432	0.021	8160	<0.0005	12600
SC-14	Cross-Gradient	03/24/2021	<0.0005	0.311	<0.000002	0.0083	7.6	<0.131	<0.488	0.0034	7560	<0.0005	11600
		09/29/2021	<0.0005	0.348	<0.000002	0.0073	7.6	<0.164	0.529	0.0049	7920	<0.0005	11600

- All samples collected for both detection monitoring and assessment monitoring
- Metals are Total Recoverable
- See laboratory reports for data qualifiers
- < Indicates that the compound was not detected above the stated laboratory reporting limit
- TDS = Total Dissolved Solids

CCR LANDFILL
Depth to Groundwater from Measuring Point (feet) and Groundwater Elevations (feet above sea level)

Monitoring Well	CC-1		FC-1		FC-2		FC-3A		FC-3B		SC-10		SC-11		SC-12		SC-13		SC-14		
Measuring Point Elevation	5479.00		5487.00		5483.00		5484.36		5483.90		5447.75		5444.68		5444.52		5446.02		5450.38		
Date Measured	Depth to Water	Water Table Elevation																			
6/22/2016	14.07	5464.93	15.53	5471.47	13.49	5469.51	.	.	.	.	11.43	5436.32	8.4	5436.28	9.29	5435.23	9.92	5436.1	9.94	5440.44
6/23/2016	17.91	5466.45
6/27/2016	.	.	.	.	.	.	.	.	48.85	5435.05	.	.	.	.	.	.	.	.	.	.
8/2/2016	13.95	5465.05	15.57	5471.43	13.67	.	17.85	5466.51	47.62	5436.28	.	.	.	.	.	.	.	.	.	.
8/3/2016	.	.	.	.	.	.	.	.	.	.	11.40	5436.35	8.15	5436.53	9.56	5434.96	10.3	5435.72	10.21	5440.17
9/13/2016	13.90	5465.10	15.45	5471.55	13.39	5469.61	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/14/2016	13.90	5465.10	15.45	5471.55	13.39	5469.61	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/19/2016	13.74	5465.26	15.55	5471.45	13.41	5469.59	17.70	5466.66	43.52	5440.38	.	.	.	.	.	.	.	.	.	.
9/20/2016	.	.	.	.	.	.	.	.	.	.	11.28	5436.47	8.28	5436.4	9.7	5434.82	10.5	5435.52	10.54	5439.84
10/12/2016	13.85	5465.15	15.40	5471.60	13.49	5469.51	17.80	5466.56	45.58	5438.32	.	.	.	.	.	.	.	.	.	.
10/13/2016	.	.	.	.	.	.	.	.	.	.	11.39	5436.36	8.3	5436.38	9.79	5434.73	10.49	5435.53	10.52	5439.86
10/25/2016	13.61	5465.39	15.18	5471.82	13.38	5469.62	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10/26/2016	13.61	5465.39	15.18	5471.82	13.38	5469.62	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11/15/2016	13.79	5465.21	15.26	5471.74	13.38	5469.62	17.54	5466.82	43.01	5440.89	.	.	.	.	.	.	.	.	.	.
11/16/2016	.	.	.	.	.	.	.	.	.	.	11.15	5436.60	8.07	5436.61	9.51	5435.01	10.15	5435.87	10.08	5440.3
1/18/2017	13.35	5465.65	15.04	5471.96	13.25	5469.75	17.51	5466.85	37.68	5446.22	.	.	.	.	.	.	.	.	.	.
1/19/2017	13.35	5465.65	15.04	5471.96	13.25	5469.75	17.51	5466.85	37.68	5446.22	11.40	5436.35	8.44	5436.24	9.42	5435.1	9.87	5436.15	9.56	5440.82	
2/14/2017	13.93	5465.07	15.39	5471.61	13.35	5469.65	17.71	5466.65	44.27	5439.63	.	.	.	.	.	.	.	.	.	.
2/15/2017	.	.	.	.	.	.	.	.	.	.	11.78	5435.97	8.74	5435.94	9.38	5435.14	9.88	5436.14	9.64	5440.74
2/22/2017	13.69	5465.31	15.09	5471.91	13.35	5469.65	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2/23/2017	13.69	5465.31	15.09	5471.91	13.35	5469.65	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2/28/2017	13.71	5465.29	15.00	5472	13.06	5469.94	17.60	5466.76	48.20	5435.70	.	.	.	.	.	.	.	.	.	.
3/1/2017	.	.	.	.	.	.	.	.	.	.	12.03	5435.72	9.05	5435.63	9.57	5434.95	9.95	5436.07	9.83	5440.55
5/16/2017	13.69	5465.31	15.26	5471.74	12.99	5470.01	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5/17/2017	13.69	5465.31	15.26	5471.74	12.99	5470.01	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5/24/2017	.	.	.	.	.	.	.	.	.	.	10.98	5436.77	7.94	5436.74	8.52	5436	9.39	5436.63	8.94	5441.44
7/24/2017	.	.	15.6	5471.4	.	.	17.78	5466.58	.	.	.	.	.	.	.	.	.	.	.	.
7/25/2017	.	.	.	.	.	.	.	.	.	.	11.25	5436.5	8.2	5436.48	9.55	5434.97	10.08	5435.94	10.14	5440.24
8/15/2017	13.46	5465.54	15.37	5471.63	13.01	5469.99	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10/16/2017	.	.	.	.	.	.	17.46	5466.90	.	.	.	.	.	.	.	.	.	.	.	.
10/24/2017	13.42	5465.58	15.52	5471.48	13.29	5469.71	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11/13/2017	13.16	5465.84	14.78	5472.22	13.10	5469.90	17.28	5467.08	22.21	5461.69	.	.	.	.	.	.	.	.	.	.
11/14/2017	.	.	.	.	.	.	.	.	.	.	10.82	5436.93	7.85	5436.83	9.05	5435.47	9.54	5436.48	9.32	5441.06
2/14/2018	13.26	5465.74	14.69	5472.31	12.91	5470.09	17.23	5467.13	28.84	5455.06	.	.	.	.	.	.	.	.	.	.
2/15/2018	.	.	.	.	.	.	.	.	.	.	11.15	5436.6	8.13	5436.55	9.04	5435.48	9.40	5436.62	8.94	5441.44

Monitoring Well	CC-1		FC-1		FC-2		FC-3A		FC-3B		SC-10		SC-11		SC-12		SC-13		SC-14	
Measuring Point Elevation	5479.00		5487.00		5483.00		5484.36		5483.90		5447.75		5444.68		5444.52		5446.02		5450.38	
Date Measured	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation
2/27/2018	13.06	5465.94	14.60	.	12.90	5470.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5/22/2018	13.43	5465.57	15.05	5471.95	12.99	5470.01	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8/28/2018	13.59	5465.41	15.20	5471.80	12.74	5470.26	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/25/2018	13.54	5465.46	14.94	5472.06	12.88	5470.12	17.25	5467.11	17.06	5466.84	.	.	.	.	.	.	.	.	.	.
9/26/2018	.	.	.	.	.	.	.	.	.	.	11.24	5436.51	8.28	5436.4	9.45	5435.07	10.39	5435.63	10.30	5440.08
11/27/2018	13.26	5465.74	14.20	5472.8	12.72	5470.28	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3/5/2019	13.70	5465.30	14.76	5472.24	12.83	5470.17	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5/14/2019	13.54	5465.46	14.79	5472.21	12.71	5470.29	17.24	5467.12	16.43	5467.47	.	.	.	.	.	.	.	.	.	.
5/15/2019	.	.	.	.	.	.	.	.	.	.	11.85	5435.9	8.87	5444.68	9.11	5435.41	9.44	5436.58	9.14	5441.24
5/29/2019	13.52	5464.48	14.82	5472.18	12.76	5470.24	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7/30/2019	13.34	5465.66	14.95	5472.05	13.08	5469.92	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/24/2019	13.36	5465.64	14.90	5472.1	13.71	5469.29	18.34	5466.02	17.57	5466.33	.	.	.	.	.	.	.	.	.	.
9/25/2019	.	.	.	.	.	.	.	.	.	.	12.62	5435.13	9.50	5435.18	10.89	5433.63	11.41	5434.61	11.69	5438.69
11/5/2019	13.38	5465.62	15.05	5471.95	13.57	5469.43	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3/3/2020	13.28	5465.72	15.25	5471.75	13.12	5469.88	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4/6/2020	13.34	5465.66	15.20	5471.80	12.99	5470.01	17.65	5466.71	17.04	5466.86	.	.	.	.	.	.	.	.	.	.
4/7/2020	.	.	.	.	.	.	.	.	.	.	13.06	5434.69	10.07	5434.61	10.38	5434.14	10.35	5435.67	10.32	5440.06
5/26/2020	13.42	5465.58	15.50	5471.50	13.13	5469.87	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10/29/2020	13.55	5465.45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11/2/2020	.	.	15.72	5471.28	14.03	5468.97	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11/16/2020	13.62	5465.38	.	.	.	.	19.00	5465.36	18.13	5465.77	.	.	.	.	.	.	11.99	5434.03	12.25	5438.13
11/17/2020	.	.	15.52	5471.48	14.09	5468.91	.	.	.	.	13.45	5434.30	10.45	5434.23	11.65	5432.87	.	.	.	.
12/2/2020	13.55	5465.45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12/3/2020	.	.	15.58	5471.42	13.87	5469.13	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1/21/2021	13.41	5465.59	15.45	5471.55	13.64	5469.36	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3/24/2021	.	.	.	.	.	.	.	.	.	.	13.60	5434.15	10.60	5434.08	10.99	5433.53	11.14	5434.88	11.35	5439.03
3/25/2021	.	.	15.51	5471.49	13.32	5469.68	18.14	5466.22	17.62	5466.28	.	.	.	.	.	.	.	.	.	.
5/17/2021	.	.	15.98	5471.02	13.84	5469.16	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5/24/2021	13.78	5465.22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/13/2021	.	.	16.01	5470.99	14.30	5468.70	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/14/2021	13.55	5465.45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9/29/2021	13.56	5465.44	15.83	5471.17	14.41	5468.59	19.48	5464.88	18.57	5465.33	13.96	5433.79	11.01	5433.67	12.28	5432.24	13.05	5432.97	13.22	5437.16
11/15/2021	13.44	5465.56	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11/17/2021	.	.	16.07	5470.93	14.38	5468.62	.	.	.	.	.	.	.	.	.	.	.	.	.	.

APPENDIX D

Laboratory Analytical Results



Colorado Springs Utilities

It's how we're all connected



Laboratory Report For:

Coal Combustion Residuals - Landfill

Colorado Springs Utilities Environmental Services

Report Authorized by: *Wendy M Asay*

Title: Environmental Specialist

Report Date: January 26, 2022

Report generated by: Wendy M. Asay

Report revised for formatting. Original issue date on May 11, 2021.

Colorado Springs Utilities Laboratory Services Section certifies that the test results meet all approved method and Laboratory Quality Assurance Plan requirements unless otherwise noted

Samples

455483	25-Mar-2021 12:46	Crooked Canyon Well #1
455484	25-Mar-2021 10:03	Fort Carson Well #1
455485	25-Mar-2021 10:35	Fort Carson Well #2
455486	25-Mar-2021 13:33	Fort Carson Well #3A
455487	25-Mar-2021 13:33	Fort Carson Well #3A
455488	25-Mar-2021 14:13	Fort Carson Well #3B
455489	25-Mar-2021 14:45	Equipment Blank
455490	24-Mar-2021 10:45	Sand Canyon Well #10
455491	24-Mar-2021 11:15	Sand Canyon Well #11
455492	24-Mar-2021 11:44	Sand Canyon Well #12
455493	24-Mar-2021 11:44	Sand Canyon Well #12
455494	24-Mar-2021 12:40	Sand Canyon Well #13
455495	24-Mar-2021 13:23	Sand Canyon Well #14
455496	24-Mar-2021 14:22	Equipment Blank

LIMS #: 455483

Sample Date: 3/25/2021 12:46:00 PM

Sample Point: CC_1

Sample Point Description: Crooked Canyon Well #1

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.4	degrees C	0.000			1
+	SM_2510_B	Conductivity	19700	umhos/cm	1			1
	NA	Depth to Water	13.35	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	33900	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.56	mg/L	0.10			1
	EPA_300_0	Chloride	1680	mg/L	0.25	D	04/01/2021	1
		Sulfate	19100	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	8.9	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	4.1	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	2.9	ug/L	1.0	D/T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	0.58	ug/L	0.20	D	04/14/2021	1
		Selenium (Total Recoverable)	185	ug/L	1.0	D	04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1060	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	419000	ug/L	100	T1/D	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	703	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.006	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	0.332	pCi/L	0.168	J	04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	1.01	pCi/L	0.59		04/21/2021	1

LIMS #: 455484

Sample Date: 3/25/2021 10:03:00 AM

Sample Point: FC_1

Sample Point Description: Fort Carson Well #1

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.7	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.8	degrees C	0.000			1
+	SM_2510_B	Conductivity	15600	umhos/cm	1			1
	NA	Depth to Water	15.51	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	21800	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.19	mg/L	0.10			1
	EPA_300_0	Chloride	844	mg/L	0.25	D	04/01/2021	1
		Sulfate	13500	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	2.2	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	13.3	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	2.7	ug/L	1.0	D/T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	2.8	ug/L	0.20	D	04/14/2021	1
		Selenium (Total Recoverable)	19.0	ug/L	1.0	D	04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1020	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	392000	ug/L	100	T1/D	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	975	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.002	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	0.517	pCi/L	0.183	J	04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	1.85	pCi/L	0.58		04/21/2021	1

LIMS #: 455485

Sample Date: 3/25/2021 10:35:00 AM

Sample Point: FC_2

Sample Point Description: Fort Carson Well #2

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.9	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.3	degrees C	0.000			1
+	SM_2510_B	Conductivity	6970	umhos/cm	1			1
	NA	Depth to Water	13.32	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	10300	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.71	mg/L	0.10			1
	EPA_300_0	Chloride	115	mg/L	0.25	D	04/01/2021	1
		Sulfate	6760	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	1.1	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	5.3	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	6.6	ug/L	1.0	D/T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	1.9	ug/L	0.20	D	04/14/2021	1
		Selenium (Total Recoverable)	35.0	ug/L	1.0	D	04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	947	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	385000	ug/L	100	T1/D	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	286	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.003	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.135	pCi/L	0.135		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.463	pCi/L	0.463		04/21/2021	1

LIMS #: 455486

Sample Date: 3/25/2021 1:33:00 PM

Sample Point: FC_3A

Sample Point Description: Fort Carson Well #3A

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.4	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.5	degrees C	0.000			1
+	SM_2510_B	Conductivity	9410	umhos/cm	1			1
	NA	Depth to Water	18.14	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	9060	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.60	mg/L	0.10			1
	EPA_300_0	Chloride	141	mg/L	0.25	D	04/01/2021	1
		Sulfate	5940	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	1.1	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	8.8	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	3.7	ug/L	1.0	D/T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	5.8	ug/L	0.20	D	04/14/2021	1
		Selenium (Total Recoverable)	35.1	ug/L	1.0	D	04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1020	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	394000	ug/L	100	T1/D	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	287	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.151	pCi/L	0.151		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.406	pCi/L	0.406		04/21/2021	1

LIMS #: 455487

Sample Date: 3/25/2021 1:33:00 PM

Sample Point: FC_3A

Sample Point Description: Fort Carson Well #3A

Collection Comments: duplicate

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	9060	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.61	mg/L	0.10			1
	EPA_300_0	Chloride	142	mg/L	0.25	D	04/01/2021	1
		Sulfate	5850	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0		04/14/2021	1
		Barium (Total Recoverable)	8.3	ug/L	0.20		04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Chromium (Total Recoverable)	3.3	ug/L	1.0	T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Molybdenum (Total Recoverable)	5.5	ug/L	0.20		04/14/2021	1
		Selenium (Total Recoverable)	42.3	ug/L	1.0		04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1030	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	401000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	296	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.144	pCi/L	0.144		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.459	pCi/L	0.459		04/21/2021	1

LIMS #: 455488

Sample Date: 3/25/2021 2:13:00 PM

Sample Point: FC_3B

Sample Point Description: Fort Carson Well #3B

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.1	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.3	degrees C	0.000			1
+	SM_2510_B	Conductivity	10900	umhos/cm	1			1
	NA	Depth to Water	17.62	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	7400	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.65	mg/L	0.10			1
	EPA_300_0	Chloride	220	mg/L	0.25	D	04/01/2021	1
		Sulfate	5940	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Arsenic (Total Recoverable)	2.3	ug/L	1.0		04/14/2021	1
		Barium (Total Recoverable)	11.2	ug/L	0.20		04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Chromium (Total Recoverable)	4.4	ug/L	1.0	T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Molybdenum (Total Recoverable)	1.0	ug/L	0.20		04/14/2021	1
		Selenium (Total Recoverable)	6.6	ug/L	1.0		04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1240	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	235000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	272	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.008	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.141	pCi/L	0.141		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.487	pCi/L	0.487		04/21/2021	1

LIMS #: 455489

Sample Date: 3/25/2021 2:45:00 PM

Sample Point: EQUIP_BLK

Sample Point Description: Equipment Blank

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	<10	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	<0.10	mg/L	0.10	U		1
	EPA_300_0	Chloride	<0.25	mg/L	0.25		04/01/2021	1
		Sulfate	<0.25	mg/L	0.25		04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0		04/14/2021	1
		Barium (Total Recoverable)	<0.20	ug/L	0.20		04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		04/15/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	T	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Molybdenum (Total Recoverable)	<0.20	ug/L	0.20		04/14/2021	1
		Selenium (Total Recoverable)	<1.0	ug/L	1.0		04/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	<20.0	ug/L	20.0		04/06/2021	1
		Calcium (Total Recoverable)	<100	ug/L	100	T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/06/2021	1
		Lithium (Total Recoverable)	<10.0	ug/L	10.0		04/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		04/12/2021	1

LIMS #: 455490

Sample Date: 3/24/2021 10:45:00 AM

Sample Point: SC_10

Sample Point Description: Sand Canyon Well #10

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.7	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.7	degrees C	0.000			1
+	SM_2510_B	Conductivity	12900	umhos/cm	1			1
	NA	Depth to Water	13.60	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	17300	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.84	mg/L	0.10			1
	EPA_300_0	Chloride	1010	mg/L	0.25	D	04/01/2021	1
		Sulfate	9700	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	11.0	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	11.1	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	1.0	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	0.63	ug/L	0.50	D	04/14/2021	1
		Molybdenum (Total Recoverable)	5.2	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	218	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1190	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	425000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	657	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.006	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.179	pCi/L	0.179		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.525	pCi/L	0.525		04/21/2021	1

LIMS #: 455491

Sample Date: 3/24/2021 11:15:00 AM

Sample Point: SC_11

Sample Point Description: Sand Canyon Well #11

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.6	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.2	degrees C	0.000			1
+	SM_2510_B	Conductivity	10900	umhos/cm	1			1
	NA	Depth to Water	10.60	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	14200	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.80	mg/L	0.10			1
	EPA_300_0	Chloride	1100	mg/L	0.25	D	04/01/2021	1
		Sulfate	8120	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	11.1	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	12.1	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	1.7	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	0.65	ug/L	0.50	D	04/14/2021	1
		Molybdenum (Total Recoverable)	2.4	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	169	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	2300	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	430000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	551	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.008	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.188	pCi/L	0.188		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.687	pCi/L	0.687		04/21/2021	1

LIMS #: 455492

Sample Date: 3/24/2021 11:44:00 AM

Sample Point: SC_12

Sample Point Description: Sand Canyon Well #12

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.5	degrees C	0.000			1
+	SM_2510_B	Conductivity	10900	umhos/cm	1			1
	NA	Depth to Water	10.99	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	15400	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	1.37	mg/L	0.10			1
	EPA_300_0	Chloride	285	mg/L	0.25	D	04/01/2021	1
		Sulfate	9370	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	5.6	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	5.7	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	2.1	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	4.7	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	12.0	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	4060	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	376000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	434	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.003	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	0.123	pCi/L	0.123	J	04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.430	pCi/L	0.430		04/21/2021	1

LIMS #: 455493

Sample Date: 3/24/2021 11:44:00 AM

Sample Point: SC_12

Sample Point Description: Sand Canyon Well #12

Collection Comments: duplicate

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	15300	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	1.36	mg/L	0.10			1
	EPA_300_0	Chloride	303	mg/L	0.25	D	04/01/2021	1
		Sulfate	9810	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	4.9	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	5.2	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	1.8	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	4.9	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	10.4	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	4180	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	387000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	446	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.003	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.122	pCi/L	0.122		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.540	pCi/L	0.540		04/21/2021	1

LIMS #: 455494

Sample Date: 3/24/2021 12:40:00 PM

Sample Point: SC_13

Sample Point Description: Sand Canyon Well #13

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.6	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	11.4	degrees C	0.000			1
+	SM_2510_B	Conductivity	8000	umhos/cm	1			1
	NA	Depth to Water	11.14	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	12600	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	1.11	mg/L	0.10			1
	EPA_300_0	Chloride	178	mg/L	0.25	D	04/01/2021	1
		Sulfate	7940	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	4.9	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	4.5	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	1.1	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	2.9	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	18.6	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1520	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	373000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	319	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	0.002	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.127	pCi/L	0.127		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	0.512	pCi/L	0.420	J	04/21/2021	1

LIMS #: 455495

Sample Date: 3/24/2021 1:23:00 PM

Sample Point: SC_14

Sample Point Description: Sand Canyon Well #14

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.6	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	10.5	degrees C	0.000			1
+	SM_2510_B	Conductivity	7770	umhos/cm	1			1
	NA	Depth to Water	11.35	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	11600	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	1.05	mg/L	0.10			1
	EPA_300_0	Chloride	159	mg/L	0.25	D	04/01/2021	1
		Sulfate	7560	mg/L	0.25	D	04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Arsenic (Total Recoverable)	4.7	ug/L	1.0	D	04/14/2021	1
		Barium (Total Recoverable)	4.5	ug/L	0.20	D	04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Chromium (Total Recoverable)	1.5	ug/L	1.0	D	04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
		Molybdenum (Total Recoverable)	8.3	ug/L	0.20	D	04/15/2021	1
		Selenium (Total Recoverable)	3.4	ug/L	1.0	D	04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	1520	ug/L	20.0	D	04/06/2021	1
		Calcium (Total Recoverable)	374000	ug/L	100	D/T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/07/2021	1
		Lithium (Total Recoverable)	311	ug/L	10.0	D	04/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		04/12/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.131	pCi/L	0.131		04/26/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.488	pCi/L	0.488		04/21/2021	1

LIMS #: 455496

Sample Date: 3/24/2021 2:22:00 PM

Sample Point: EQUIP_BLK

Sample Point Description: Equipment Blank

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	<10	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	<0.10	mg/L	0.10	U		1
	EPA_300_0	Chloride	<0.25	mg/L	0.25		04/01/2021	1
		Sulfate	<0.25	mg/L	0.25		04/01/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0		04/14/2021	1
		Barium (Total Recoverable)	<0.20	ug/L	0.20		04/14/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		04/14/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0		04/15/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
		Molybdenum (Total Recoverable)	<0.20	ug/L	0.20		04/15/2021	1
		Selenium (Total Recoverable)	<1.0	ug/L	1.0		04/14/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		04/14/2021	1
	EPA_200_7	Boron (Total Recoverable)	<20.0	ug/L	20.0		04/06/2021	1
		Calcium (Total Recoverable)	<100	ug/L	100	T1	04/06/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		04/06/2021	1
		Lithium (Total Recoverable)	<10.0	ug/L	10.0		04/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		04/12/2021	1

Flags

- * Analysis performed by an external contract laboratory.
- + Analysis performed in the field.

Data Qualifiers

See below for list of qualifiers.

Glossary

DQ - Data Qualifier

RL – Reporting Limit

MDL – Method Detection Limit

Dil Fac – Dilution Factor

Case Narrative

D - Value reported is multiplied by a dilution factor. The reporting limit is not.

D1 - To minimize matrix effects, the sample required dilution. The result is below the Reporting Limit, but within the method defined instrument detection.

J - Analysis confirms the presence of the analyte at a concentration which is less than the established RL, but greater than the MDL. The associated concentration value reported is approximate.

T- MS recovery outside the established range. The recovery is matrix related, not method related.

T1 - The analyte concentration is disproportionate to the spike level.

U - Data result less than the method detection limit.

CCR Landfill Groundwater Assessment

Sample Date: ~~3-22-21~~ 3-25-21

QC Report Needed

Sampler: Dan Mikalian

LOCATION	# Bottles	LIMS #	Sample Time	Please mark boxes that apply												Comments
				pH, Field (su) SM 4500 H	Temperature, Field (°C) SM 2550 B	Conductivity, Field (umhos/cm) SM 2510 B	Depth to Water (feet)	Fluoride, SM 4500 F C	Total Dissolved Solids, SM 2540 C	Chloride, Sulfate EPA 300.0	EPA 200.7 (B, Ca, Co & Li - Total Recoverable)	EPA 200.8 (Sb, As, Ba, Be, Cd, Cr, Pb, Mo, Se & Tl - Total Recoverable)	Mercury, EPA 1631 (not collect using clean-hands/dirty-hands)	Total Radium 226 & Radium 228 (Sent to Test America St. Louis)		
CC_1	8	455483	1246	7.52	12.36	19,663	13.35	X	X	X	X	X	X	X		
FC_1	8	455484	1003	7.74	12.79	15,557	15.51	X	X	X	X	X	X	X		
FC_2	8	455485	1035	7.90	12.31	6,971	13.32	X	X	X	X	X	X	X		
FC_3A QC Sample	8	455486	1333	7.45	12.5	9,410	18.14	X	X	X	X	X	X	X		
FC_3A Duplicate	8	455487	1333					X	X	X	X	X	X	X		
FC_3B	8	455488	1413	7.10	12.3	10,910	17.62	X	X	X	X	X	X	X		
EQUIP_BLK	6	455489	1445					X	X	X	X	X	X			
Total # of Bottles	51							1-500 mL GP	1-250 mL GP	1-250 mL GP	1-500 mL New Certified plastic	1-500 mL New Certified plastic	1-250 mL glass acid-washed	2-1000 mL plastic		

Signature/Print last name: [Signature] Mikalian

Relinquished by: [Signature] Date/Time: 15:15 @ 3/25/21

Received by: [Signature] Date/Time: 3-26-21 @ 0715

Additional Comments / Sample Rejections/ Actions
 Workflow: CCR_LANDFILL
 Project ID: CCR_LAND
 Test Schedule: CCR_LAND
 Samples are NOT filtered in the field.

Note: 2 coolers

SR LOCK box used
mre

CCR Landfill Groundwater Assessment

Sample Date: ~~3-23-21~~ 3-24-21 *JH*

QC Report Needed

Sampler: Josh Foss

LOCATION	# Bottles	LIMS #	Sample Time	Please mark boxes that apply												Comments
				pH, Field (su) SM 4500 H	Temperature, Field (°C) SM 2550 B	Conductivity, Field (umhos/cm) SM 2510 B	Depth to Water (feet)	Fluoride, SM 4500 F C	Total Dissolved Solids, SM 2540 C	Chloride, Sulfate EPA 300.0	EPA 200.7 (B, Ca, Co & Li - Total Recoverable)	EPA 200.8 (Pb, As, Ba, Be, Cd, Cr, Pb, Mo, Se & Tl - Total Recoverable)	Mercury, EPA 1631 (not collected using clean-hands/dirty-hands)	Total Radium 226 & Radium 228 (Sent to Test America St. Louis)		
SC_10	8	455490	1045	7.70	13.73	12,937	13.60	X	X	X	X	X	X	X		
SC_11	8	455491	1115	7.61	13.22	10,898	10.60	X	X	X	X	X	X	X		
SC_12 QC Sample	8	455492	1144	7.47	12.52	10,862	10.99	X	X	X	X	X	X	X		
SC_12 Duplicate	8	455493	1144					X	X	X	X	X	X	X		
SC_13	8	455494	1240	7.61	11.36	7,996	11.14	X	X	X	X	X	X	X		
SC_14	8	455495	1323	7.57	10.53	7,769	11.35	X	X	X	X	X	X	X		
EQUIP_BLK	4	455496	1422					X	X	X	X	X	X			
Total # of Bottles	54							1-500 mL GP	1-250 mL GP	1-250 mL GP	1-500 mL New Certified plastic	1-500 mL New Certified plastic	1-250 mL glass acid-washed	2-1000 mL plastic		

Relinquished by *Josh Foss* Signature/Print last name

Date/Time 3-24-21 @ 1500

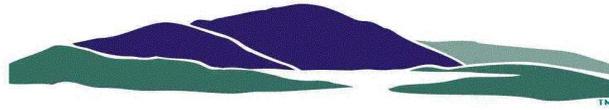
Received by *Mary Campbell*

3-24-21 @ 1500 *Mme*
3-25-21 @ 0710

Additional Comments / Sample Rejections/ Actions
Workflow: CCR_LANDFILL
Project ID: CCR_LAND
Test Schedule: CCR_LAND
Samples are NOT filtered in the field.

*SP 1000 box used.
Mme*

Note: Two coolers. - *JH*



Colorado Springs Utilities
It's how we're all connected

**Laboratory Services Section
QC Report**

**CCR Landfill Assessment
March 2021**

Quality Assurance Approval: Lesley Susic

Date: 5/9/2021

QC Narrative

This report is for sample numbers 455783 - 455496.

Total Dissolved Solids by Standard Methods 2540 C

There are no anomalies to report for this analysis.

Fluoride by Standard Methods 4500 F C

There are no anomalies to report for this analysis.

Anions by EPA Method 300.0

There are no anomalies to report for this analysis.

Mercury by EPA 1631 E

There are no anomalies to report for this analysis.

EPA 200.7

The analyte concentration in the samples is disproportionate to the spike level for Total Recoverable Calcium in samples 455486 and 455492. The performance of the method is shown to be in control. Associated calcium data is qualified.

EPA 200.8

The matrix spike recovery for chromium is outside the established range for sample 455486. The method is shown to be in control. Associated samples are qualified.

Method: Total Dissolved Solids by Standard Methods 2540 C

Batch Analysis date: 3/26/21

Sampled date: 3/24/21 for samples 455490 - 455496

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on samples 455486 and 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
QCS	Total Dissolved Solids	95	89 - 110		
Duplicate	Total Dissolved Solids (455486)			<1	<10
Duplicate	Total Dissolved Solids (455492)			<1	<10

Method: Fluoride by Standard Methods 4500 F C

Batch Analysis date: 3/26/21

Sampled date: 3/24/21 for samples 455490 - 455496

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on samples 455486 and 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Fluoride (Total)	106	90 - 110		
QCS	Fluoride (Total)	90	90 - 110		
MS	Fluoride (Total) (455486)	88	80 - 120		
MSD	Fluoride (Total) (455486)			1	<20
MS	Fluoride (Total) (455492)	91	80 - 120		
MSD	Fluoride (Total) (455492)			<1	<20
QC Type	Analyte	Concentration	Limit		
LRB	Fluoride (Total)	<0.10 mg/L	0.10 mg/L		

Method: Anions by EPA Method 300.0

Batch Analysis date: 4/1/21

Sampled date: 3/24/21 for samples 455490 - 455496

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on samples 455486 and 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Chloride	90	50-150		
LFB	Chloride	103	90-110	<1	<20
FD	Chloride (455486)			1	<20
FD	Chloride (455492)			6	<20
MS	Chloride (455486)	100	80-120		
MS	Chloride (455492)	101	80-120		

MRL	Sulfate	92	50-150		
LFB	Sulfate	102	90-110	<1	<20
FD	Sulfate (455486)			1	<20
FD	Sulfate (455492)			4	<20
MS	Sulfate (455486)	97	80-120		
MS	Sulfate (455492)	96	80-120		
QC Type	Analyte	Concentration	Limit		
LRB	Chloride	<0.25 mg/L	0.25 mg/L		
LRB	Sulfate	<0.25 mg/L	0.25 mg/L		

Method: Mercury by EPA 1631 E

Batch Analysis date: 4/12/21

Sampled date: 3/24/21 for samples 455490 - 455496

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on sample 455486 and 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Mercury (Total)	115	50-150		
QCS	Mercury (Total)	110	77-123		
MS	Mercury (Total) (455486)	88	71-125		
MSD	Mercury (Total) (455486)			8	<24
MS	Mercury (Total) (455492)	80	71-125		
MSD	Mercury (Total) (455492)			4	<24
QC Type	Analyte	Concentration	Limit		
LRB	Mercury (Total)	<0.5 ng/L	0.5 ng/L		

Method: EPA 200.7

Batch Analysis date: 4/6/21 for B, Ca, and Li

Batch Analysis date: 4/7/21 for Co

Digestion date: 3/30/21

Sampled date: 3/24/21 for samples 455490 - 455496

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on samples 455486 and 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Boron (Total Recoverable)	100	50-150		
LFB	Boron (Total Recoverable)	102	85-115		
MS	Boron (Total Recoverable) (455486)	106	70-130		
MSD	Boron (Total Recoverable) (455486)			3	<20
MS	Boron (Total Recoverable) (455492)	116	70-130		
MSD	Boron (Total Recoverable) (455492)			1	<20

MRL	Calcium (Total Recoverable)	114	50-150		
LFB	Calcium (Total Recoverable)	100	85-115		
MS	Calcium (Total Recoverable) (455486)	*196	70-130		
MSD	Calcium (Total Recoverable) (455486)			<1	<20
MS	Calcium (Total Recoverable) (455492)	*155	70-130		
MSD	Calcium (Total Recoverable) (455492)			1	<20
MRL	Cobalt (Total Recoverable)	103	50-150		
LFB	Cobalt (Total Recoverable)	102	85-115		
MS	Cobalt (Total Recoverable) (455486)	89	70-130		
MSD	Cobalt (Total Recoverable) (455486)			<1	<20
MS	Cobalt (Total Recoverable) (455492)	97	70-130		
MSD	Cobalt (Total Recoverable) (455492)			<1	<20
MRL	Lithium (Total Recoverable)	105	50-150		
LFB	Lithium (Total Recoverable)	104	85-115		
MS	Lithium (Total Recoverable) (455486)	110	70-130		
MSD	Lithium (Total Recoverable) (455486)			<1	<20
MS	Lithium (Total Recoverable) (455492)	108	70-130		
MSD	Lithium (Total Recoverable) (455492)			<1	<20
QC Type	Analyte	Concentration	Limit		
LRB	Boron (Total Recoverable)	<7.35 ug/L	7.35 ug/L		
LRB	Calcium (Total Recoverable)	<14.5 ug/L	14.5 ug/L		
LRB	Cobalt (Total Recoverable)	<0.95 ug/L	0.95 ug/L		
LRB	Lithium (Total Recoverable)	<4.29 ug/L	4.29 ug/L		

***See Narrative**

EPA Method: EPA 200.8

Digestion date: 4/12/21

Batch Analysis date: 4/14/21 for all except Cr and Mo

Batch Analysis date: 4/15/21 for Cr and Mo

Sampled date: 3/24/21 for samples 455490 - 455496

Matrix QC performed on sample 455492

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Antimony (Total Recoverable)	95	50-150		
LFB	Antimony (Total Recoverable)	98	85-115		
MS	Antimony (Total Recoverable)	75	70-130		
MSD	Antimony (Total Recoverable)			<1	<20
MRL	Arsenic (Total Recoverable)	119	50-150		
LFB	Arsenic (Total Recoverable)	101	85-115		
MS	Arsenic (Total Recoverable)	74	70-130		
MSD	Arsenic (Total Recoverable)			3	<20
MRL	Barium (Total Recoverable)	102	50-150		
LFB	Barium (Total Recoverable)	101	85-115		
MS	Barium (Total Recoverable)	80	70-130		
MSD	Barium (Total Recoverable)			<1	<20
MRL	Beryllium (Total Recoverable)	99	50-150		
LFB	Beryllium (Total Recoverable)	99	85-115		
MS	Beryllium (Total Recoverable)	74	70-130		
MSD	Beryllium (Total Recoverable)			<1	<20

MRL	Cadmium (Total Recoverable)	99	50-150		
LFB	Cadmium (Total Recoverable)	99	85-115		
MS	Cadmium (Total Recoverable)	76	70-130		
MSD	Cadmium (Total Recoverable)			4	<20
MRL	Chromium (Total Recoverable)	103	50-150		
LFB	Chromium (Total Recoverable)	104	85-115		
MS	Chromium (Total Recoverable)	77	70-130		
MSD	Chromium (Total Recoverable)			1	<20
MRL	Lead (Total Recoverable)	97	50-150		
LFB	Lead (Total Recoverable)	99	85-115		
MS	Lead (Total Recoverable)	78	70-130		
MSD	Lead (Total Recoverable)			3	<20
MRL	Molybdenum (Total Recoverable)	104	50-150		
LFB	Molybdenum (Total Recoverable)	98	85-115		
MS	Molybdenum (Total Recoverable)	78	70-130		
MSD	Molybdenum (Total Recoverable)			<1	<20
MRL	Selenium (Total Recoverable)	87	50-150		
LFB	Selenium (Total Recoverable)	97	85-115		
MS	Selenium (Total Recoverable)	71	70-130		
MSD	Selenium (Total Recoverable)			<1	<20
MRL	Thallium (Total Recoverable)	103	50-150		
LFB	Thallium (Total Recoverable)	101	85-115		
MS	Thallium (Total Recoverable)	83	70-130		
MSD	Thallium (Total Recoverable)			<1	<20

QC Type	Analyte	Concentration	Limit
LRB	Antimony (Total Recoverable)	<0.18 ug/L	0.18 ug/L
LRB	Arsenic (Total Recoverable)	<0.13 ug/L	0.13 ug/L
LRB	Barium (Total Recoverable)	<0.10 ug/L	0.10 ug/L
LRB	Beryllium (Total Recoverable)	<0.08 ug/L	0.08 ug/L
LRB	Cadmium (Total Recoverable)	<0.12 ug/L	0.12 ug/L
LRB	Chromium (Total Recoverable)	<0.35 ug/L	0.35 ug/L
LRB	Lead (Total Recoverable)	<0.11 ug/L	0.11 ug/L
LRB	Molybdenum (Total Recoverable)	<0.14 ug/L	0.14 ug/L
LRB	Selenium (Total Recoverable)	<0.44 ug/L	0.44 ug/L
LRB	Thallium (Total Recoverable)	<0.50 ug/L	0.50 ug/L

Method: EPA 200.8

Digestion date: 4/12/21

Batch Analysis date: 4/14/21 for all except Be, Cr and Se

Batch Analysis date: 4/15/21 for Be, Cr and Se

Sampled date: 3/25/21 for samples 455483 - 455489

Matrix QC performed on sample 455486

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Antimony (Total Recoverable)	118	50-150		
LFB	Antimony (Total Recoverable)	96	85-115		
MS	Antimony (Total Recoverable)	79	70-130		
MSD	Antimony (Total Recoverable)			3	<20
MRL	Arsenic (Total Recoverable)	118	50-150		
LFB	Arsenic (Total Recoverable)	96	85-115		
MS	Arsenic (Total Recoverable)	75	70-130		
MSD	Arsenic (Total Recoverable)			12	<20
MRL	Barium (Total Recoverable)	120	50-150		
LFB	Barium (Total Recoverable)	100	85-115		
MS	Barium (Total Recoverable)	79	70-130		
MSD	Barium (Total Recoverable)			1	<20
MRL	Beryllium (Total Recoverable)	77	50-150		
LFB	Beryllium (Total Recoverable)	99	85-115		
MS	Beryllium (Total Recoverable)	77	70-130		
MSD	Beryllium (Total Recoverable)			10	<20
MRL	Cadmium (Total Recoverable)	120	50-150		
LFB	Cadmium (Total Recoverable)	98	85-115		
MS	Cadmium (Total Recoverable)	78	70-130		
MSD	Cadmium (Total Recoverable)			1	<20
MRL	Chromium (Total Recoverable)	106	50-150		
LFB	Chromium (Total Recoverable)	102	85-115		
MS	Chromium (Total Recoverable)	*158	70-130		
MSD	Chromium (Total Recoverable)			<1	<20
MRL	Lead (Total Recoverable)	118	50-150		
LFB	Lead (Total Recoverable)	96	85-115		
MS	Lead (Total Recoverable)	76	70-130		
MSD	Lead (Total Recoverable)			1	<20
MRL	Molybdenum (Total Recoverable)	121	50-150		
LFB	Molybdenum (Total Recoverable)	98	85-115		
MS	Molybdenum (Total Recoverable)	82	70-130		
MSD	Molybdenum (Total Recoverable)			2	<20
MRL	Selenium (Total Recoverable)	96	50-150		
LFB	Selenium (Total Recoverable)	96	85-115		
MS	Selenium (Total Recoverable)	82	70-130		
MSD	Selenium (Total Recoverable)			6	<20
MRL	Thallium (Total Recoverable)	124	50-150		
LFB	Thallium (Total Recoverable)	99	85-115		
MS	Thallium (Total Recoverable)	80	70-130		
MSD	Thallium (Total Recoverable)			4	<20
QC Type	Analyte	Concentration		Limit	
LRB	Antimony (Total Recoverable)	<0.18 ug/L		0.18 ug/L	
LRB	Arsenic (Total Recoverable)	<0.13 ug/L		0.13 ug/L	

LRB	Barium (Total Recoverable)	<0.10 ug/L	0.10 ug/L
LRB	Beryllium (Total Recoverable)	<0.08 ug/L	0.08 ug/L
LRB	Cadmium (Total Recoverable)	<0.12 ug/L	0.12 ug/L
LRB	Chromium (Total Recoverable)	<0.35 ug/L	0.35 ug/L
LRB	Lead (Total Recoverable)	<0.11 ug/L	0.11 ug/L
LRB	Molybdenum (Total Recoverable)	<0.14 ug/L	0.14 ug/L
LRB	Selenium (Total Recoverable)	<0.44 ug/L	0.44 ug/L
LRB	Thallium (Total Recoverable)	<0.50 ug/L	0.50 ug/L

***See Narrative**

FD – Field Duplicate

LFB – Laboratory Fortified Blank

LRB – Laboratory Reagent Blank (Method Blank)

QCS – Quality Control Sample

MRL – Minimum Reporting Limit (Verification)

MS – Matrix Spike

MSD – Matrix Spike Duplicate

Underline – Data was outside the limit



Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-41597-1
Client Project/Site: Coal Combustion Rule

For:
Colorado Springs Utilities
Laboratory Services Section
701 E. Las Vegas St., MC 1465
Colorado Springs, Colorado 80903

Attn: Ms. Wendy Asay

Authorized for release by:
4/30/2021 10:45:33 AM
Micha Korrinhizer, Supervisor I
(314)298-8566
Micha.Korrinhizer@Eurofinset.com

Designee for
Rhonda Ridenhower, Client Service Manager
(314)298-8566
Rhonda.Ridenhower@Eurofinset.com

Received: 4/30/21 wma
Entered: 5/4/21 wma
Authorized: 5/10/2021 KDW

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



LINKS

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Case Narrative

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Job ID: 160-41597-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Colorado Springs Utilities

Project: Coal Combustion Rule

Report Number: 160-41597-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 4/2/2021 9:25 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 11.0° C and 11.1° C.

RADIUM-226 (GFPC)

Case Narrative

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Job ID: 160-41597-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

Samples 455490 SC_10 (160-41597-1), 455491 SC_11 (160-41597-2), 455492 SC_12 (160-41597-3), 455493 SC_12 duplicate (160-41597-4), 455494 SC_13 (160-41597-5), 455495 SC_14 (160-41597-6), 455483 CC_1 (160-41597-7), 455484 FC_1 (160-41597-8), 455485 FC_2 (160-41597-9), 455486 FC_3A (160-41597-10), 455487 FC_3A duplicate (160-41597-11) and 455488 FC_3B (160-41597-12) were analyzed for Radium-226 (GFPC) in accordance with EPA Method 903.0. The samples were prepared on 04/02/2021 and analyzed on 04/26/2021.

Insufficient sample volume was available to perform a sample duplicate on the following samples in batch 160-504226: 455492 SC_12 (160-41597-3), 455493 SC_12 duplicate (160-41597-4), 455494 SC_13 (160-41597-5), 455495 SC_14 (160-41597-6), 455485 FC_2 (160-41597-9), 455486 FC_3A (160-41597-10), 455487 FC_3A duplicate (160-41597-11) and 455488 FC_3B (160-41597-12). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228 (GFPC)

Samples 455490 SC_10 (160-41597-1), 455491 SC_11 (160-41597-2), 455492 SC_12 (160-41597-3), 455493 SC_12 duplicate (160-41597-4), 455494 SC_13 (160-41597-5), 455495 SC_14 (160-41597-6), 455483 CC_1 (160-41597-7), 455484 FC_1 (160-41597-8), 455485 FC_2 (160-41597-9), 455486 FC_3A (160-41597-10), 455487 FC_3A duplicate (160-41597-11) and 455488 FC_3B (160-41597-12) were analyzed for Radium-228 (GFPC) in accordance with EPA 904. The samples were prepared on 04/02/2021 and analyzed on 04/21/2021.

Insufficient sample volume was available to perform a sample duplicate on the following samples in batch 160-504227: 455492 SC_12 (160-41597-3), 455493 SC_12 duplicate (160-41597-4), 455494 SC_13 (160-41597-5), 455495 SC_14 (160-41597-6), 455485 FC_2 (160-41597-9), 455486 FC_3A (160-41597-10), 455487 FC_3A duplicate (160-41597-11) and 455488 FC_3B (160-41597-12). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

The Laboratory Control Sample (LCSD 160-504227/2-A) associated with batch 160-504227 recovered at (131%) for Radium 228. The limits in our LIMS system, at 75%-125%, reflect the requirements of a regulatory agency that represents a large amount of our work; however, the samples associated with this LCS are not from this agency and are, therefore, held to our in-house statistical limits of 61-138%, per method requirements. The LCS passes and no further action is required.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Earth City, MO 63045-1205
phone 314.298.8566 fax 314.298.8757

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other: **Coal Combustion Rule**

Client Contact
Colorado Springs Utilities
701 E. Las Vegas St.
Colorado Springs, CO 80903
(719) 668-4603 Phone
(xxx) xxx-xxxx FAX
Project Name: Coal Combustion Rule
Site:
P O #

Project Manager: Wendy Asay
Tel/Fax: 719-649-7796

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
TAT if different from Below _____
 2 weeks
 1 week
 2 days
 1 day

Site Contact: Rhonda Ridenhower
Lab Contact: Rhonda Ridenhower
Carrier:
Date:

COC No.: _____ of _____ COCs

Sampler: _____
For Lab Use Only: _____
Walk-in Client: _____
Lab Sampling: _____
Job / SDG No.: _____

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Total Radium 226, EPA 9030	Total Radium 228, EPA 9040	Sample Specific Notes:
455490 SC_10	3/24/21	1045	G	GW	2	N	X	X		
455491 SC_11	3/24/21	1115	G	GW	2	N	X	X		
455492 SC_12	3/24/21	1144	G	GW	2	N	X	X		
455493 SC_12 duplicate	3/24/21	1144	G	GW	2	N	X	X		
455494 SC_13	3/24/21	1240	G	GW	2	N	X	X		
455495 SC_14	3/24/21	1323	G	GW	2	N	X	X		
455483 CC_1	3/25/21	1246	G	GW	2	N	X	X		
455484 FC_1	3/25/21	1003	G	GW	2	N	X	X		
455485 FC_2	3/25/21	1035	G	GW	2	N	X	X		
455486 FC_3A	3/25/21	1333	G	GW	2	N	X	X		
455487 FC_3A duplicate	3/25/21	1333	G	GW	2	N	X	X		
455488 FC_3B	3/25/21	1413	G	GW	2	N	X	X		



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
 Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: Please be sure to use the listed method numbers.

Return to Client Disposal by Lab Archive for _____ Months

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Received by: **FED EX** Company: _____
Date/Time: 3/24/21 10:30

Received by: **Steve Wohlman** Company: **ETAS**
Date/Time: 4/2/21 09:25

Received in Laboratory by: _____ Company: _____
Date/Time: _____

Custody Seal No.: _____
Company: **LSU**
Company: **FED EX**



Login Sample Receipt Checklist

Client: Colorado Springs Utilities

Job Number: 160-41597-1

Login Number: 41597

List Source: Eurofins TestAmerica, St. Louis

List Number: 1

Creator: Worthington, Sierra M

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Definitions/Glossary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Sample Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-41597-1	455490 SC_10	Water	03/24/21 10:45	04/02/21 09:25	
160-41597-2	455491 SC_11	Water	03/24/21 11:15	04/02/21 09:25	
160-41597-3	455492 SC_12	Water	03/24/21 11:44	04/02/21 09:25	
160-41597-4	455493 SC_12 duplicate	Water	03/24/21 11:44	04/02/21 09:25	
160-41597-5	455494 SC_13	Water	03/24/21 12:40	04/02/21 09:25	
160-41597-6	455495 SC_14	Water	03/24/21 13:23	04/02/21 09:25	
160-41597-7	455483 CC_1	Water	03/25/21 12:46	04/02/21 09:25	
160-41597-8	455484 FC_1	Water	03/25/21 10:03	04/02/21 09:25	
160-41597-9	455485 FC_2	Water	03/25/21 10:35	04/02/21 09:25	
160-41597-10	455486 FC_3A	Water	03/25/21 13:33	04/02/21 09:25	
160-41597-11	455487 FC_3A duplicate	Water	03/25/21 13:33	04/02/21 09:25	
160-41597-12	455488 FC_3B	Water	03/25/21 14:13	04/02/21 09:25	



Detection Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455490 SC_10	Lab Sample ID: 160-41597-1
<input type="checkbox"/> No Detections.	
Client Sample ID: 455491 SC_11	Lab Sample ID: 160-41597-2
<input type="checkbox"/> No Detections.	
Client Sample ID: 455492 SC_12	Lab Sample ID: 160-41597-3
<input type="checkbox"/> No Detections.	
Client Sample ID: 455493 SC_12 duplicate	Lab Sample ID: 160-41597-4
<input type="checkbox"/> No Detections.	
Client Sample ID: 455494 SC_13	Lab Sample ID: 160-41597-5
<input type="checkbox"/> No Detections.	
Client Sample ID: 455495 SC_14	Lab Sample ID: 160-41597-6
<input type="checkbox"/> No Detections.	
Client Sample ID: 455483 CC_1	Lab Sample ID: 160-41597-7
<input type="checkbox"/> No Detections.	
Client Sample ID: 455484 FC_1	Lab Sample ID: 160-41597-8
<input type="checkbox"/> No Detections.	
Client Sample ID: 455485 FC_2	Lab Sample ID: 160-41597-9
<input type="checkbox"/> No Detections.	
Client Sample ID: 455486 FC_3A	Lab Sample ID: 160-41597-10
<input type="checkbox"/> No Detections.	
Client Sample ID: 455487 FC_3A duplicate	Lab Sample ID: 160-41597-11
<input type="checkbox"/> No Detections.	
Client Sample ID: 455488 FC_3B	Lab Sample ID: 160-41597-12
<input type="checkbox"/> No Detections.	

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455490 SC_10
Date Collected: 03/24/21 10:45
Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-1
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0373	U <0.179	0.0968	0.0969	1.00	0.179	pCi/L	04/02/21 19:44	04/26/21 11:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					04/02/21 19:44	04/26/21 11:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0926	U <0.525	0.278	0.278	1.00	0.525	pCi/L	04/02/21 20:09	04/21/21 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					04/02/21 20:09	04/21/21 12:37	1
Y Carrier	79.3		40 - 110					04/02/21 20:09	04/21/21 12:37	1

Client Sample ID: 455491 SC_11
Date Collected: 03/24/21 11:15
Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-2
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.105	U <0.188	0.117	0.118	1.00	0.188	pCi/L	04/02/21 19:44	04/26/21 11:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	76.2		40 - 110					04/02/21 19:44	04/26/21 11:35	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.231	U <0.687	0.404	0.404	1.00	0.687	pCi/L	04/02/21 20:09	04/21/21 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	76.2		40 - 110					04/02/21 20:09	04/21/21 12:37	1
Y Carrier	79.3		40 - 110					04/02/21 20:09	04/21/21 12:37	1

Client Sample ID: 455492 SC_12
Date Collected: 03/24/21 11:44
Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-3
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.123	J	0.0871	0.0878	1.00	0.123	pCi/L	04/02/21 19:44	04/26/21 11:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.4		40 - 110					04/02/21 19:44	04/26/21 11:35	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455492 SC_12

Lab Sample ID: 160-41597-3

Date Collected: 03/24/21 11:44

Matrix: Water

Date Received: 04/02/21 09:25

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.307	U <0.430	0.269	0.270	1.00	0.430	pCi/L	04/02/21 20:09	04/21/21 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.4		40 - 110					04/02/21 20:09	04/21/21 12:37	1
Y Carrier	80.7		40 - 110					04/02/21 20:09	04/21/21 12:37	1

Client Sample ID: 455493 SC_12 duplicate

Lab Sample ID: 160-41597-4

Date Collected: 03/24/21 11:44

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0734	U <0.122	0.0776	0.0779	1.00	0.122	pCi/L	04/02/21 19:44	04/26/21 11:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					04/02/21 19:44	04/26/21 11:35	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.127	U <0.540	0.315	0.315	1.00	0.540	pCi/L	04/02/21 20:09	04/21/21 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					04/02/21 20:09	04/21/21 12:37	1
Y Carrier	81.1		40 - 110					04/02/21 20:09	04/21/21 12:37	1

Client Sample ID: 455494 SC_13

Lab Sample ID: 160-41597-5

Date Collected: 03/24/21 12:40

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0939	U <0.127	0.0835	0.0839	1.00	0.127	pCi/L	04/02/21 19:44	04/26/21 11:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.2		40 - 110					04/02/21 19:44	04/26/21 11:35	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.512	J	0.284	0.288	1.00	0.420	pCi/L	04/02/21 20:09	04/21/21 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.2		40 - 110					04/02/21 20:09	04/21/21 12:37	1

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Client Sample Results

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455494 SC_13
 Date Collected: 03/24/21 12:40
 Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-5
 Matrix: Water

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Y Carrier	80.0		40 - 110	04/02/21 20:09	04/21/21 12:37	1

Client Sample ID: 455495 SC_14
 Date Collected: 03/24/21 13:23
 Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-6
 Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00183	U <0.131	0.0635	0.0635	1.00	0.131	pCi/L	04/02/21 19:44	04/26/21 11:36	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	85.9		40 - 110	04/02/21 19:44	04/26/21 11:36	1				

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0883	U <0.488	0.281	0.281	1.00	0.488	pCi/L	04/02/21 20:09	04/21/21 12:38	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	85.9		40 - 110	04/02/21 20:09	04/21/21 12:38	1				
Y Carrier	80.7		40 - 110	04/02/21 20:09	04/21/21 12:38	1				

Client Sample ID: 455483 CC_1
 Date Collected: 03/25/21 12:46
 Date Received: 04/02/21 09:25

Lab Sample ID: 160-41597-7
 Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.332	J	0.149	0.152	1.00	0.168	pCi/L	04/02/21 19:44	04/26/21 11:36	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	87.6		40 - 110	04/02/21 19:44	04/26/21 11:36	1				

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.01		0.418	0.428	1.00	0.586	pCi/L	04/02/21 20:09	04/21/21 12:38	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	87.6		40 - 110	04/02/21 20:09	04/21/21 12:38	1				
Y Carrier	82.2		40 - 110	04/02/21 20:09	04/21/21 12:38	1				

Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455484 FC_1

Lab Sample ID: 160-41597-8

Date Collected: 03/25/21 10:03

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.517	J	0.181	0.187	1.00	0.183	pCi/L	04/02/21 19:44	04/26/21 11:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.7		40 - 110					04/02/21 19:44	04/26/21 11:36	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.85		0.477	0.506	1.00	0.579	pCi/L	04/02/21 20:09	04/21/21 12:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.7		40 - 110					04/02/21 20:09	04/21/21 12:38	1
Y Carrier	81.5		40 - 110					04/02/21 20:09	04/21/21 12:38	1

Client Sample ID: 455485 FC_2

Lab Sample ID: 160-41597-9

Date Collected: 03/25/21 10:35

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.123	U <0.135	0.0938	0.0945	1.00	0.135	pCi/L	04/02/21 19:44	04/26/21 11:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.1		40 - 110					04/02/21 19:44	04/26/21 11:36	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.272	U <0.463	0.284	0.285	1.00	0.463	pCi/L	04/02/21 20:09	04/21/21 12:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.1		40 - 110					04/02/21 20:09	04/21/21 12:43	1
Y Carrier	82.2		40 - 110					04/02/21 20:09	04/21/21 12:43	1

Client Sample ID: 455486 FC_3A

Lab Sample ID: 160-41597-10

Date Collected: 03/25/21 13:33

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0420	U <0.151	0.0848	0.0849	1.00	0.151	pCi/L	04/02/21 19:44	04/26/21 11:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					04/02/21 19:44	04/26/21 11:37	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455486 FC_3A

Lab Sample ID: 160-41597-10

Date Collected: 03/25/21 13:33

Matrix: Water

Date Received: 04/02/21 09:25

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.102	U <0.406	0.235	0.235	1.00	0.406	pCi/L	04/02/21 20:09	04/21/21 12:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					04/02/21 20:09	04/21/21 12:43	1
Y Carrier	80.7		40 - 110					04/02/21 20:09	04/21/21 12:43	1

Client Sample ID: 455487 FC_3A duplicate

Lab Sample ID: 160-41597-11

Date Collected: 03/25/21 13:33

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.118	U <0.144	0.0959	0.0965	1.00	0.144	pCi/L	04/02/21 19:44	04/26/21 14:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.5		40 - 110					04/02/21 19:44	04/26/21 14:03	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.372	U <0.459	0.290	0.292	1.00	0.459	pCi/L	04/02/21 20:09	04/21/21 12:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.5		40 - 110					04/02/21 20:09	04/21/21 12:43	1
Y Carrier	83.0		40 - 110					04/02/21 20:09	04/21/21 12:43	1

Client Sample ID: 455488 FC_3B

Lab Sample ID: 160-41597-12

Date Collected: 03/25/21 14:13

Matrix: Water

Date Received: 04/02/21 09:25

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0345	U <0.141	0.0780	0.0781	1.00	0.141	pCi/L	04/02/21 19:44	04/26/21 14:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.7		40 - 110					04/02/21 19:44	04/26/21 14:03	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.317	U <0.487	0.301	0.303	1.00	0.487	pCi/L	04/02/21 20:09	04/21/21 12:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.7		40 - 110					04/02/21 20:09	04/21/21 12:43	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Client Sample ID: 455488 FC_3B

Lab Sample ID: 160-41597-12

Date Collected: 03/25/21 14:13

Matrix: Water

Date Received: 04/02/21 09:25

Method: 904.0 - Radium-228 (GFPC) (Continued)

<u>Carrier</u>	<u>%Yield</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Y Carrier	83.0		40 - 110	04/02/21 20:09	04/21/21 12:43	1

- 1
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QC Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-504226/15-A
Matrix: Water
Analysis Batch: 507113

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 504226

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.03482	U	0.0767	0.0767	1.00	0.139	pCi/L	04/02/21 19:44	04/26/21 14:03	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	88.2		40 - 110		04/02/21 19:44	04/26/21 14:03	1			

Lab Sample ID: LCS 160-504226/1-A
Matrix: Water
Analysis Batch: 507113

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 504226

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.33		1.23	1.00	0.175	pCi/L	100	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	77.4		40 - 110						

Lab Sample ID: LCSD 160-504226/2-A
Matrix: Water
Analysis Batch: 507113

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 504226

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER
				Uncert. (2σ+/-)							Limit
Radium-226	11.3	12.43		1.33	1.00	0.132	pCi/L	110	75 - 125	0.43	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	79.1		40 - 110								

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-504227/15-A
Matrix: Water
Analysis Batch: 506460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 504227

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.1599	U	0.234	0.235	1.00	0.394	pCi/L	04/02/21 20:09	04/21/21 12:43	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	88.2		40 - 110		04/02/21 20:09	04/21/21 12:43	1			
Y Carrier	84.1		40 - 110		04/02/21 20:09	04/21/21 12:43	1			

QC Sample Results

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-504227/1-A
Matrix: Water
Analysis Batch: 506443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 504227

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									75	125
Radium-228	7.27	9.081		1.14	1.00	0.500	pCi/L	125	75 - 125	
LCS LCS										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	77.4		40 - 110							
Y Carrier	81.9		40 - 110							

Lab Sample ID: LCSD 160-504227/2-A
Matrix: Water
Analysis Batch: 506443

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 504227

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
									75	125	0.18	1
Radium-228	7.27	9.492		1.18	1.00	0.505	pCi/L	131	75 - 125	0.18	1	
LCSD LCSD												
Carrier	%Yield	Qualifier	Limits									
Ba Carrier	79.1		40 - 110									
Y Carrier	82.2		40 - 110									

QC Association Summary

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Rad

Prep Batch: 504226

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41597-1	455490 SC_10	Total/NA	Water	PrecSep-21	
160-41597-2	455491 SC_11	Total/NA	Water	PrecSep-21	
160-41597-3	455492 SC_12	Total/NA	Water	PrecSep-21	
160-41597-4	455493 SC_12 duplicate	Total/NA	Water	PrecSep-21	
160-41597-5	455494 SC_13	Total/NA	Water	PrecSep-21	
160-41597-6	455495 SC_14	Total/NA	Water	PrecSep-21	
160-41597-7	455483 CC_1	Total/NA	Water	PrecSep-21	
160-41597-8	455484 FC_1	Total/NA	Water	PrecSep-21	
160-41597-9	455485 FC_2	Total/NA	Water	PrecSep-21	
160-41597-10	455486 FC_3A	Total/NA	Water	PrecSep-21	
160-41597-11	455487 FC_3A duplicate	Total/NA	Water	PrecSep-21	
160-41597-12	455488 FC_3B	Total/NA	Water	PrecSep-21	
MB 160-504226/15-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-504226/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-504226/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 504227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41597-1	455490 SC_10	Total/NA	Water	PrecSep_0	
160-41597-2	455491 SC_11	Total/NA	Water	PrecSep_0	
160-41597-3	455492 SC_12	Total/NA	Water	PrecSep_0	
160-41597-4	455493 SC_12 duplicate	Total/NA	Water	PrecSep_0	
160-41597-5	455494 SC_13	Total/NA	Water	PrecSep_0	
160-41597-6	455495 SC_14	Total/NA	Water	PrecSep_0	
160-41597-7	455483 CC_1	Total/NA	Water	PrecSep_0	
160-41597-8	455484 FC_1	Total/NA	Water	PrecSep_0	
160-41597-9	455485 FC_2	Total/NA	Water	PrecSep_0	
160-41597-10	455486 FC_3A	Total/NA	Water	PrecSep_0	
160-41597-11	455487 FC_3A duplicate	Total/NA	Water	PrecSep_0	
160-41597-12	455488 FC_3B	Total/NA	Water	PrecSep_0	
MB 160-504227/15-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-504227/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-504227/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Tracer/Carrier Summary

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-41597-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
160-41597-1	455490 SC_10	93.2	
160-41597-2	455491 SC_11	76.2	
160-41597-3	455492 SC_12	97.4	
160-41597-4	455493 SC_12 duplicate	85.9	
160-41597-5	455494 SC_13	88.2	
160-41597-6	455495 SC_14	85.9	
160-41597-7	455483 CC_1	87.6	
160-41597-8	455484 FC_1	89.7	
160-41597-9	455485 FC_2	84.1	
160-41597-10	455486 FC_3A	88.8	
160-41597-11	455487 FC_3A duplicate	91.5	
160-41597-12	455488 FC_3B	84.7	
LCS 160-504226/1-A	Lab Control Sample	77.4	
LCSD 160-504226/2-A	Lab Control Sample Dup	79.1	
MB 160-504226/15-A	Method Blank	88.2	

Tracer/Carrier Legend
 Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
160-41597-1	455490 SC_10	93.2	79.3
160-41597-2	455491 SC_11	76.2	79.3
160-41597-3	455492 SC_12	97.4	80.7
160-41597-4	455493 SC_12 duplicate	85.9	81.1
160-41597-5	455494 SC_13	88.2	80.0
160-41597-6	455495 SC_14	85.9	80.7
160-41597-7	455483 CC_1	87.6	82.2
160-41597-8	455484 FC_1	89.7	81.5
160-41597-9	455485 FC_2	84.1	82.2
160-41597-10	455486 FC_3A	88.8	80.7
160-41597-11	455487 FC_3A duplicate	91.5	83.0
160-41597-12	455488 FC_3B	84.7	83.0
LCS 160-504227/1-A	Lab Control Sample	77.4	81.9
LCSD 160-504227/2-A	Lab Control Sample Dup	79.1	82.2
MB 160-504227/15-A	Method Blank	88.2	84.1

Tracer/Carrier Legend
 Ba = Ba Carrier
 Y = Y Carrier



Colorado Springs Utilities

It's how we're all connected



Laboratory Report For:

Coal Combustion Residuals - Landfill

Colorado Springs Utilities Environmental Services

Report Authorized by: *Wendy M Asay*

Title: Environmental Specialist

Report Date: January 26, 2022

Report generated by: Wendy M. Asay

Report revised for formatting. Original issue date on November 30, 2021.

Colorado Springs Utilities Laboratory Services Section certifies that the test results meet all approved method and Laboratory Quality Assurance Plan requirements unless otherwise noted

Samples

463137	30-Sep-2021 09:55	Crooked Canyon Well #1
463138	29-Sep-2021 14:32	Fort Carson Well #1
463139	29-Sep-2021 15:05	Fort Carson Well #2
463140	30-Sep-2021 12:12	Fort Carson Well #3A
463141	30-Sep-2021 11:26	Fort Carson Well #3B
463142	30-Sep-2021 11:26	Fort Carson Well #3B
463143	30-Sep-2021 12:31	Equipment Blank
463144	29-Sep-2021 09:58	Sand Canyon Well #10
463145	29-Sep-2021 10:26	Sand Canyon Well #11
463146	29-Sep-2021 10:54	Sand Canyon Well #12
463147	29-Sep-2021 11:42	Sand Canyon Well #13
463148	29-Sep-2021 11:42	Sand Canyon Well #13
463150	29-Sep-2021 13:03	Equipment Blank
463153	29-Sep-2021 15:19	Sand Canyon Well #14

LIMS #: 463137

Sample Date: 9/30/2021 9:55:53 AM

Sample Point: CC_1

Sample Point Description: Crooked Canyon Well #1

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.2	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	12.3	degrees C	0.000			1
+	SM_2510_B	Conductivity	23100	umhos/cm	1			1
	NA	Depth to Water	13.56	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	34300	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.24	mg/L	0.10			1
	EPA_300_0	Chloride	1670	mg/L	0.25	D	10/08/2021	1
		Sulfate	19600	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	12.2	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	2.6	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	0.37	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	216	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	985	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	392000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	737	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.005	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	0.355	pCi/L	0.224	J	11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	0.935	pCi/L	0.658	J	10/29/2021	1

LIMS #: 463138

Sample Date: 9/29/2021 2:32:00 PM

Sample Point: FC_1

Sample Point Description: Fort Carson Well #1

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.4	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.9	degrees C	0.000			1
+	SM_2510_B	Conductivity	18500	umhos/cm	1			1
	NA	Depth to Water	15.83	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	22000	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.13	mg/L	0.10			1
	EPA_300_0	Chloride	809	mg/L	0.25	D	10/08/2021	1
		Sulfate	13100	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	3.6	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	5.9	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	1.2	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	14.9	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	979	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	369000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	1000	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.002	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	1.02	pCi/L	0.24		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	1.85	pCi/L	0.56		10/29/2021	1

LIMS #: 463139

Sample Date: 9/29/2021 3:05:00 PM

Sample Point: FC_2

Sample Point Description: Fort Carson Well #2

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.3	degrees C	0.000			1
+	SM_2510_B	Conductivity	8260	umhos/cm	1			1
	NA	Depth to Water	14.41	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	9860	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.52	mg/L	0.10			1
	EPA_300_0	Chloride	102	mg/L	0.25	D	10/08/2021	1
		Sulfate	6540	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/15/2021	1
		Barium (Total Recoverable)	4.6	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	1.6	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	40.4	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	918	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	305000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	285	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.004	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.198	pCi/L	0.198		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<1.47	pCi/L	1.47		11/05/2021	1

LIMS #: 463140

Sample Date: 9/30/2021 12:12:53 PM

Sample Point: FC_3A

Sample Point Description: Fort Carson Well #3A

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.6	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.1	degrees C	0.000			1
+	SM_2510_B	Conductivity	7440	umhos/cm	1			1
	NA	Depth to Water	19.48	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	9140	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.46	mg/L	0.10			1
	EPA_300_0	Chloride	131	mg/L	0.25	D	10/08/2021	1
		Sulfate	5750	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	2.6	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	11.1	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	6.3	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	41.9	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1000	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	380000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	306	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.233	pCi/L	0.233		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.750	pCi/L	0.750		10/29/2021	1

LIMS #: 463141

Sample Date: 9/30/2021 11:26:53 AM

Sample Point: FC_3B

Sample Point Description: Fort Carson Well #3B

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.8	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	13.5	degrees C	0.000			1
+	SM_2510_B	Conductivity	7500	umhos/cm	1			1
	NA	Depth to Water	18.57	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	6880	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.63	mg/L	0.10			1
	EPA_300_0	Chloride	207	mg/L	0.25	D	10/09/2021	1
		Sulfate	4440	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	3.4	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	5.3	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	0.39	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	7.2	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/15/2021	1
	EPA_200_7	Boron (Total Recoverable)	1210	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	209000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/05/2021	1
		Lithium (Total Recoverable)	289	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.207	pCi/L	0.207		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	0.709	pCi/L	0.606	J	10/29/2021	1

LIMS #: 463142

Sample Date: 9/30/2021 11:26:53 AM

Sample Point: FC_3B

Sample Point Description: Fort Carson Well #3B

Collection Comments: duplicate

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	6740	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.63	mg/L	0.10			1
	EPA_300_0	Chloride	209	mg/L	0.25	D	10/09/2021	1
		Sulfate	4400	mg/L	0.25	D	10/08/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	2.8	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	7.7	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	0.78	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	7.7	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1210	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	210000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	287	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002	T	10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	0.427	pCi/L	0.213	J	11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	0.791	pCi/L	0.672	J	10/29/2021	1

LIMS #: 463143

Sample Date: 9/30/2021 12:31:53 PM

Sample Point: EQUIP_BLK

Sample Point Description: Equipment Blank

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	<10	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	<0.10	mg/L	0.10	J		1
	EPA_300_0	Chloride	<0.25	mg/L	0.25			1
		Sulfate	<0.25	mg/L	0.25			1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0		10/15/2021	1
		Barium (Total Recoverable)	<0.20	ug/L	0.20		10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0		10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Molybdenum (Total Recoverable)	<0.20	ug/L	0.20		10/07/2021	1
		Selenium (Total Recoverable)	<1.0	ug/L	1.0		10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	<20.0	ug/L	20.0		10/05/2021	1
		Calcium (Total Recoverable)	<100	ug/L	100	T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/05/2021	1
		Lithium (Total Recoverable)	<10.0	ug/L	10.0		10/05/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002	T	10/05/2021	1

LIMS #: 463144

Sample Date: 9/29/2021 9:58:00 AM

Sample Point: SC_10

Sample Point Description: Sand Canyon Well #10

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	14.6	degrees C	0.000			1
+	SM_2510_B	Conductivity	15300	umhos/cm	1			1
	NA	Depth to Water	13.96	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	17000	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.55	mg/L	0.10	T		1
	EPA_300_0	Chloride	1020	mg/L	0.25	D	10/09/2021	1
		Sulfate	9870	mg/L	0.25	D	10/09/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	11.8	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	11.6	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	0.80	ug/L	0.50	D	10/07/2021	1
		Molybdenum (Total Recoverable)	3.8	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	256	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1130	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	387000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	708	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.007	ug/L	0.002		10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.758	pCi/L	0.758		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<1.93	pCi/L	1.93		10/29/2021	1

LIMS #: 463145

Sample Date: 9/29/2021 10:26:00 AM

Sample Point: SC_11

Sample Point Description: Sand Canyon Well #11

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	14.3	degrees C	0.000			1
+	SM_2510_B	Conductivity	13300	umhos/cm	1			1
	NA	Depth to Water	11.01	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	13900	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.58	mg/L	0.10	T		1
	EPA_300_0	Chloride	1130	mg/L	0.25	D	10/09/2021	1
		Sulfate	8170	mg/L	0.25	D	10/09/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	11.5	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	6.4	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	1.9	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	226	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	2290	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	411000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	607	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.008	ug/L	0.002		10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.355	pCi/L	0.355		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.967	pCi/L	0.967		10/29/2021	1

LIMS #: 463146

Sample Date: 9/29/2021 10:54:00 AM

Sample Point: SC_12

Sample Point Description: Sand Canyon Well #12

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	16.1	degrees C	0.000			1
+	SM_2510_B	Conductivity	13400	umhos/cm	1			1
	NA	Depth to Water	12.28	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	15200	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.95	mg/L	0.10	T		1
	EPA_300_0	Chloride	293	mg/L	0.25	D	10/09/2021	1
		Sulfate	10000	mg/L	0.25	D	10/09/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	1.3	ug/L	1.0	D	10/15/2021	1
		Barium (Total Recoverable)	8.4	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	3.3	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	9.4	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	3920	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	361000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	467	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	0.002	ug/L	0.002		10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.205	pCi/L	0.205		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.690	pCi/L	0.690		10/29/2021	1

LIMS #: 463147

Sample Date: 9/29/2021 11:42:00 AM

Sample Point: SC_13

Sample Point Description: Sand Canyon Well #13

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.5	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	14.5	degrees C	0.000			1
+	SM_2510_B	Conductivity	10300	umhos/cm	1			1
	NA	Depth to Water	13.05	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	12400	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.80	mg/L	0.10	T		1
	EPA_300_0	Chloride	171	mg/L	0.25	D	10/09/2021	1
		Sulfate	8220	mg/L	0.25	D	10/09/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/15/2021	1
		Barium (Total Recoverable)	4.2	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0		10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	2.3	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	22.4	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1510	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	344000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/05/2021	1
		Lithium (Total Recoverable)	364	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.149	pCi/L	0.149		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.404	pCi/L	0.404		10/29/2021	1

LIMS #: 463148

Sample Date: 9/29/2021 11:42:00 AM

Sample Point: SC_13

Sample Point Description: Sand Canyon Well #13

Collection Comments: duplicate

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	12600	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.81	mg/L	0.10	T		1
	EPA_300_0	Chloride	171	mg/L	0.25	D	10/09/2021	1
		Sulfate	8160	mg/L	0.25	D	10/09/2021	1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/15/2021	1
		Barium (Total Recoverable)	3.6	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	2.1	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	21.0	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1500	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	349000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/05/2021	1
		Lithium (Total Recoverable)	358	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		10/05/2021	1
*	EPA_903_0	Radium 226 (Total)	0.257	pCi/L	0.194	J	11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	<0.432	pCi/L	0.432		10/29/2021	1

LIMS #: 463150

Sample Date: 9/29/2021 1:03:00 PM

Sample Point: EQUIP_BLK

Sample Point Description: Equipment Blank

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
	SM_2540_C	Total Dissolved Solids	<10	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	<0.10	mg/L	0.10	U		1
	EPA_300_0	Chloride	<0.25	mg/L	0.25			1
		Sulfate	<0.25	mg/L	0.25			1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0		10/15/2021	1
		Barium (Total Recoverable)	<0.20	ug/L	0.20		10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20		10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0		10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
		Molybdenum (Total Recoverable)	<0.20	ug/L	0.20		10/07/2021	1
		Selenium (Total Recoverable)	<1.0	ug/L	1.0		10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50		10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	<20.0	ug/L	20.0		10/05/2021	1
		Calcium (Total Recoverable)	<100	ug/L	100	T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/05/2021	1
		Lithium (Total Recoverable)	<10.0	ug/L	10.0		10/05/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		10/05/2021	1

LIMS #: 463153

Sample Date: 9/29/2021 3:19:00 PM

Sample Point: SC_14

Sample Point Description: Sand Canyon Well #14

Collection Comments:

Sample Type: GRAB

Sampler Initials: TERRACON

Flag	Method	Analyte	Result	Units	RL	Data Qualifiers	Analyzed On	Dilution Factor
+	SM_4500HB	pH	7.6	SU	2.0			1
+	SM_2550_B	Temperature Centigrade (Field)	11.9	degrees C	0.000			1
+	SM_2510_B	Conductivity	9270	umhos/cm	1			1
	NA	Depth to Water	13.22	ft.	0.0000			1
	SM_2540_C	Total Dissolved Solids	11600	mg/L	10			1
	SM_4500_FC	Fluoride (Total)	0.74	mg/L	0.10	T		1
	EPA_200_8	Antimony (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Arsenic (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/15/2021	1
		Barium (Total Recoverable)	3.7	ug/L	0.20	D	10/07/2021	1
		Beryllium (Total Recoverable)	<0.20	ug/L	0.20	D/D1	10/18/2021	1
		Cadmium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Chromium (Total Recoverable)	<1.0	ug/L	1.0	D/D1	10/08/2021	1
		Lead (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
		Molybdenum (Total Recoverable)	7.3	ug/L	0.20	D	10/07/2021	1
		Selenium (Total Recoverable)	4.9	ug/L	1.0	D	10/15/2021	1
		Thallium (Total Recoverable)	<0.50	ug/L	0.50	D/D1	10/07/2021	1
	EPA_200_7	Boron (Total Recoverable)	1460	ug/L	20.0		10/06/2021	1
		Calcium (Total Recoverable)	348000	ug/L	100	D/T1	10/05/2021	1
		Cobalt (Total Recoverable)	<5.00	ug/L	5.00		10/06/2021	1
		Lithium (Total Recoverable)	348	ug/L	10.0		10/06/2021	1
	EPA_1631	Mercury (Total)	<0.002	ug/L	0.002		10/05/2021	1
	EPA_300_0	Chloride	163	mg/L	0.25	D	10/09/2021	1
		Sulfate	7920	mg/L	0.25	D	10/09/2021	1
*	EPA_903_0	Radium 226 (Total)	<0.164	pCi/L	0.164		11/03/2021	1
*	EPA_904_0	Radium 228 (Total)	0.529	pCi/L	0.413	J	10/29/2021	1

Flags

- * Analysis performed by an external contract laboratory.
- + Analysis performed in the field.

Data Qualifiers

See below for qualifier descriptions.

Glossary

DQ - Data Qualifier

RL – Reporting Limit

MDL – Method Detection Limit

Dil Fac – Dilution Factor

Case Narrative

D - Value reported is multiplied by a dilution factor. The reporting limit is not.

D1 - To minimize matrix effects, the sample required dilution. The result is below the Reporting Limit, but within the method defined instrument detection.

J - Analysis confirms the presence of the analyte at a concentration which is less than the established RL, but greater than the MDL. The associated concentration value reported is approximate.

T- MS recovery outside the established range. The recovery is matrix related, not method related.

T1 - The analyte concentration is disproportionate to the spike level.

U - Data result less than the method detection limit.

CCR Landfill Groundwater Assessment

Sample Date: ~~9/30/2021~~ 9-29-21

QC Report Needed

Sampler: DSM / Foss

pH, Field (su) SM 4500 H	Temperature, Field (°C) SM 2550 B	Conductivity, Field (umhos/cm) SM 2510 B	Depth to Water (feet)	Fluoride, SM 4500 F C	Total Dissolved Solids, SM 2540 C	Chloride, Sulfate EPA 300.0	EPA 200.7 (B, Ca, Co & Li - Total Recoverable)	EPA 200.8 (Sb, As, Ba, Be, Cd, Cr, Pb, Mo, Se & Tl - Total Recoverable)	Mercury, EPA 1631 (not collect using clean-hands/dirty-hands)	Total Radium 226 & Radium 228 (Sent to Test America St. Louis)	Comments
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LOCATION	# Bottles	LIMS #	Sample Time	Please mark boxes that apply										Comments	
SC_10	8	463144	0958	7.46	14.6	15.31	13.96	X	X	X	X	X	X	X	
SC_11	8	463145	1026	7.46	14.3	13.306	11.01	X	X	X	X	X	X	X	
SC_12	8	463146	1054	7.47	16.1	13.449	12.28	X	X	X	X	X	X	X	
SC_13 QC Sample	8	463147	1142	7.50	14.5	10.343	13.05	X	X	X	X	X	X	X	
SC_13 Duplicate	8	463148	1142					X	X	X	X	X	X	X	
SC_14	8	463453	1303	7.59	11.9	9.274	13.22	X	X	X	X	X	X	X	
EQUIP_BLK	6	463150	1519					X	X	X	X	X	X		
Total # of Bottles	54							1-500 mL GP	1-250 mL GP	1-250 mL GP	1-500 mL New Certified plastic	1-500 mL New Certified plastic	1-250 mL glass acid-washed	2-1000 mL plastic	

Signature/Print last name

Date/Time

Relinquished by

[Signature] Foss

9-29-21 @ 1600

Received by

[Signature] Campbell

9/29/21 @ 0720

30
m

Additional Comments / Sample Rejections/ Actions

Workflow: CCR_LANDFILL
Project ID: CCR_LAND
Test Schedule: CCR_LAND

Samples are NOT filtered in the field.

SR lock box used.
m

CCR Landfill Groundwater Assessment

Sample Date: 9/29/2021

QC Report Needed

Sampler: DJM / Foss

LOCATION	# Bottles	LIMS #	Sample Time	pH, Field (su) SM 4500 H	Temperature, Field (°C) SM 2550 B	Conductivity, Field (umhos/cm) SM 2510 B	Depth to Water (feet)	Fluoride, SM 4500 F C	Total Dissolved Solids, SM 2540 C	Chloride, Sulfate EPA 300.0	EPA 200.7 (B, Ca, Co & Li - Total Recoverable)	EPA 200.8 (Sb, As, Ba, Be, Cd, Cr, Pb, Mo, Se & Tl - Total Recoverable)	Mercury, EPA 1631 (not collect using clean-hands/dirty-hands)	Total Radium 226 & Radium 228 (Sent to Test America St. Louis)	Comments
CC_1		463137						X	X	X	X	X	X	X	will sample 9/30
FC_1	8	463138	1432	7.37	13.9	18,466	15.83	X	X	X	X	X	X	X	
FC_2	7	463139	1505	7.46	13.3	8,263	14.41	X	X	X	X	X	X	X	1000 mL had a broken cap. Unable to close *
FC_9A		463140						X	X	X	X	X	X	X	will sample 9/30
FC_3B QC Sample		463141						X	X	X	X	X	X	X	
FC_3B Duplicate		463142						X	X	X	X	X	X	X	
EQUIP_BLK		463143						X	X	X	X	X	X	X	
Total # of Bottles	15														

Signature/Print last name: [Signature] Foss
 Relinquished by: [Signature] Foss Date/Time: 9-29-21 @ 1600
 Received by: [Signature] Campbell Date/Time: 9/30/21 @ 0726

Additional Comments / Sample Rejections / Actions
 Workflow: CCR_LANDFILL
 Project ID: CCR_LAND
 Test Schedule: CCR_LAND
 Samples are NOT filtered in the field.

SR 1000 mL box used.
 mme
 * Filled new heads bottle w/ sample from other bottles to obtain sufficient volume.
 mme

CCR Landfill Groundwater Assessment

Sample Date: 9/29/2021 9-30-21

QC Report Needed



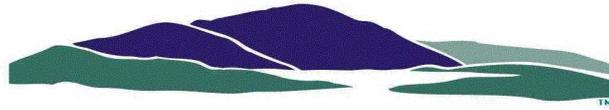
Colorado Springs Utilities
Laboratory Services
Grab Samples

Sampler: DJM / Foss

LOCATION	# Bottles	LIMS #	Sample Time	PH, Field (su) SM 4500 H	Temperature, Field (°C) SM 2550 B	Conductivity Field (umhos/cm) SM 2510 B	Depth to Water (feet)	Fluoride, SM 4500 F C	Total Dissolved Solids, SM 2540 C	Chloride, Sulfate EPA 300.0	EPA 200.7 (B, Ca, Co & Li - Total Recoverable)	EPA 200.8 (Sb, As, Ba, Be, Cd, Cr, Pb, Mo, Se & Tl - Total Recoverable)	Mercury, EPA 1631 (not collect using clean-hands/dirty-hands)	Total Radium 226 & Radium 228 (Sent to Test America St. Louis)	Comments
Please mark boxes that apply															
CC_1	8	463137	0955	7.16	12.3	23,143	13.56	X	X	X	X	X	X	X	
FC_1		463138						X	X	X	X	X	X	X	
FC_2		463139						X	X	X	X	X	X	X	Sampled 9/29
FC_3A	8	463140	1212	7.56	13.1	7,436	19.48	X	X	X	X	X	X	X	
FC_3B QC Sample	8	463141	1126	7.85	13.5	7,504	18.57	X	X	X	X	X	X	X	
FC_3B Duplicate	8	463142	1126					X	X	X	X	X	X	X	
EQUIP_BLK	6	463143	1231					X	X	X	X	X	X		
Total # of Bottles	38														

Signature/Print last name
 Relinquished by: *[Signature]* / Mikalian Date/Time: 9/30/21 @ 1305
 Received by: *[Signature]* Campbell Date/Time: 9/30/21 @ 1705

Additional Comments / Sample Rejections/ Actions
 Workflow: CCR_LANDFILL
 Project ID: CCR_LAND
 Test Schedule: CCR_LAND
 Samples are NOT filtered in the field.



Colorado Springs Utilities
It's how we're all connected

**Laboratory Services Section
QC Report**

**CCR Landfill Assessment
September 2021**

Quality Assurance Approval: Lesley Susic

Date: 11-2-2021

QC Narrative

This report is for sample numbers 463137 – 463150 and 463153.

Total Dissolved Solids by Standard Methods 2540 C

There are no anomalies to report for this analysis.

Fluoride by Standard Methods 4500 F C

The matrix spike recovery is outside the established range for sample 463147. The method is shown to be in control. Associated samples are qualified.

Anions by EPA Method 300.0

There are no anomalies to report for this analysis.

Mercury by EPA 1631 E

The matrix spike recovery is outside the established range for sample 463141. The method is shown to be in control. Associated samples are qualified.

EPA 200.7

The analyte concentration in the sample is disproportionate to the spike level for Total Recoverable Calcium in sample 463147. The performance of the method is shown to be in control. Associated calcium data are qualified.

EPA 200.8

There are no anomalies to report for this analysis.

Method: Total Dissolved Solids by Standard Methods 2540 C

Batch Analysis date: 10/1/21

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on samples 463142 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
QCS	Total Dissolved Solids	91	89 - 110		
Duplicate	Total Dissolved Solids (463142)			7	<10
Duplicate	Total Dissolved Solids (463147)			<1	<10

Method: Fluoride by Standard Methods 4500 F C

Batch Analysis date: 10/1/21

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on samples 463141 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Fluoride (Total)	100	90 - 110		
QCS	Fluoride (Total)	98	90 - 110		
MS	Fluoride (Total) (463141)	93	80 - 120		
MSD	Fluoride (Total) (463141)			<1	<20
MS	Fluoride (Total) (463147)	*66	80 - 120		
MSD	Fluoride (Total) (463147)			<1	<20
QC Type	Analyte	Concentration	Limit		
LRB	Fluoride (Total)	<0.10 mg/L	0.10 mg/L		

***See Narrative**

Method: Anions by EPA Method 300.0

Batch Analysis date: 10/8/21

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on samples 463141 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Chloride	92	50-150		
LFB	Chloride	100	90-110	<1	<20
FD	Chloride (463141)			<1	<20
FD	Chloride (463147)			<1	<20
MS	Chloride (463141)	98	80-120		
MS	Chloride (463147)	99	80-120		
MRL	Sulfate	108	50-150		
LFB	Sulfate	100	90-110	<1	<20

FD	Sulfate (463141)			<1	<20
FD	Sulfate (463147)			<1	<20
MS	Sulfate (463141)	96	80-120		
MS	Sulfate (463147)	94	80-120		
QC Type	Analyte	Concentration	Limit		
LRB	Chloride	<0.25 mg/L	0.25 mg/L		
LRB	Sulfate	<0.25 mg/L	0.25 mg/L		

Method: Mercury by EPA 1631 E

Batch Analysis date: 10/5/21

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on sample 463141 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Mercury (Total)	98	50-150		
QCS	Mercury (Total)	88	77-123		
MS	Mercury (Total) (463141)	*66	71-125		
MSD	Mercury (Total) (463141)			3	<24
MS	Mercury (Total) (463147)	81	71-125		
MSD	Mercury (Total) (463147)			4	<24
QC Type	Analyte	Concentration	Limit		
LRB	Mercury (Total)	<0.5 ng/L	0.5 ng/L		

***See Narrative**

Method: EPA 200.7

Batch Analysis date: 10/6/21 for B, Co, and Li

Batch Analysis date: 10/5/21 for Ca

Digestion date: 10/4/21

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on samples 463141 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Boron (Total Recoverable)	114	50-150		
LFB	Boron (Total Recoverable)	104	85-115		
MS	Boron (Total Recoverable) (463141)	93	70-130		
MSD	Boron (Total Recoverable) (463141)			1	<20
MS	Boron (Total Recoverable) (463147)	108	70-130		
MSD	Boron (Total Recoverable) (463147)			3	<20
MRL	Calcium (Total Recoverable)	114	50-150		
LFB	Calcium (Total Recoverable)	96	85-115		

MS	Calcium (Total Recoverable) (463141)	71	70-130		
MSD	Calcium (Total Recoverable) (463141)			2	<20
MS	Calcium (Total Recoverable) (463147)	*69	70-130		
MSD	Calcium (Total Recoverable) (463147)			1	<20
MRL	Cobalt (Total Recoverable)	99	50-150		
LFB	Cobalt (Total Recoverable)	100	85-115		
MS	Cobalt (Total Recoverable) (463141)	86	70-130		
MSD	Cobalt (Total Recoverable) (463141)			<1	<20
MS	Cobalt (Total Recoverable) (463147)	84	70-130		
MSD	Cobalt (Total Recoverable) (463147)			<1	<20
MRL	Lithium (Total Recoverable)	107	50-150		
LFB	Lithium (Total Recoverable)	106	85-115		
MS	Lithium (Total Recoverable) (463141)	113	70-130		
MSD	Lithium (Total Recoverable) (463141)			<1	<20
MS	Lithium (Total Recoverable) (463147)	128	70-130		
MSD	Lithium (Total Recoverable) (463147)			3	<20

QC Type	Analyte	Concentration	Limit
LRB	Boron (Total Recoverable)	<7.35 ug/L	7.35 ug/L
LRB	Calcium (Total Recoverable)	<16.5 ug/L	14.6 ug/L
LRB	Cobalt (Total Recoverable)	<1.12 ug/L	1.12 ug/L
LRB	Lithium (Total Recoverable)	<8.27 ug/L	8.27 ug/L

***See Narrative**

EPA Method: EPA 200.8

Digestion date: 10/4/21

Batch Analysis date: 10/7/21 for Ba, Cd, Mo, Pb, Sb and Tl

Batch Analysis date: 10/8/21 for Cr

Batch Analysis date: 10/15/21 for As and Se

Batch Analysis date: 10/18/21 for Be

Sampled date: 9/29/21 for samples 463138, 463139, 463144 – 463148, 463150 and 463153

Sampled date: 9/30/21 for samples 463137, and 463140 - 463143

Matrix QC performed on sample 463141 and 463147

QC Type	Analyte	Recovery (%)	Acceptable Range (%)	RPD (%)	RPD Limit (%)
MRL	Antimony (Total Recoverable)	98	50-150		
LFB	Antimony (Total Recoverable)	97	85-115		
MS	Antimony (Total Recoverable) (463141)	80	70-130		
MSD	Antimony (Total Recoverable) (463141)			2	<20
MS	Antimony (Total Recoverable) (463147)	80	70-130		
MSD	Antimony (Total Recoverable) (463147)			<1	<20
MRL	Arsenic (Total Recoverable)	52	50-150		
LFB	Arsenic (Total Recoverable)	108	85-115		
MS	Arsenic (Total Recoverable) (463141)	89	70-130		
MSD	Arsenic (Total Recoverable) (463141)			4	<20
MS	Arsenic (Total Recoverable) (463147)	99	70-130		

MSD	Arsenic (Total Recoverable) (463147)			<1	<20
MRL	Barium (Total Recoverable)	114	50-150		
LFB	Barium (Total Recoverable)	99	85-115		
MS	Barium (Total Recoverable) (463141)	97	70-130		
MSD	Barium (Total Recoverable) (463141)			<1	<20
MS	Barium (Total Recoverable) (463147)	88	70-130		
MSD	Barium (Total Recoverable) (463147)			2	<20
MRL	Beryllium (Total Recoverable)	110	50-150		
LFB	Beryllium (Total Recoverable)	102	85-115		
MS	Beryllium (Total Recoverable) (463141)	80	70-130		
MSD	Beryllium (Total Recoverable) (463141)			<1	<20
MS	Beryllium (Total Recoverable) (463147)	78	70-130		
MSD	Beryllium (Total Recoverable) (463147)			9	<20
MRL	Cadmium (Total Recoverable)	97	50-150		
LFB	Cadmium (Total Recoverable)	97	85-115		
MS	Cadmium (Total Recoverable) (463141)	80	70-130		
MSD	Cadmium (Total Recoverable) (463141)			3	<20
MS	Cadmium (Total Recoverable) (463147)	83	70-130		
MSD	Cadmium (Total Recoverable) (463147)			3	<20
MRL	Chromium (Total Recoverable)	90	50-150		
LFB	Chromium (Total Recoverable)	104	85-115		
MS	Chromium (Total Recoverable) (463141)	100	70-130		
MSD	Chromium (Total Recoverable) (463141)			4	<20
MS	Chromium (Total Recoverable) (463147)	122	70-130		
MSD	Chromium (Total Recoverable) (463147)			7	<20
MRL	Lead (Total Recoverable)	96	50-150		
LFB	Lead (Total Recoverable)	97	85-115		
MS	Lead (Total Recoverable) (463141)	79	70-130		
MSD	Lead (Total Recoverable) (463141)			1	<20
MS	Lead (Total Recoverable) (463147)	81	70-130		
MSD	Lead (Total Recoverable) (463147)			<1	<20
MRL	Molybdenum (Total Recoverable)	114	50-150		
LFB	Molybdenum (Total Recoverable)	99	85-115		
MS	Molybdenum (Total Recoverable) (463141)	84	70-130		
MSD	Molybdenum (Total Recoverable) (463141)			3	<20
MS	Molybdenum (Total Recoverable) (463147)	87	70-130		
MSD	Molybdenum (Total Recoverable) (463147)			<1	<20

MRL	Selenium (Total Recoverable)	82	50-150		
LFB	Selenium (Total Recoverable)	109	85-115		
MS	Selenium (Total Recoverable) (463141)	91	70-130		
MSD	Selenium (Total Recoverable) (463141)			9	<20
MS	Selenium (Total Recoverable) (463147)	78	70-130		
MSD	Selenium (Total Recoverable) (463147)			8	<20
MRL	Thallium (Total Recoverable)	92	50-150		
LFB	Thallium (Total Recoverable)	96	85-115		
MS	Thallium (Total Recoverable) (463141)	78	70-130		
MSD	Thallium (Total Recoverable) (463141)			3	<20
MS	Thallium (Total Recoverable) (463147)	79	70-130		
MSD	Thallium (Total Recoverable) (463147)			2	<20

QC Type	Analyte	Concentration	Limit
LRB	Antimony (Total Recoverable)	<0.18 ug/L	0.18 ug/L
LRB	Arsenic (Total Recoverable)	<0.13 ug/L	0.13 ug/L
LRB	Barium (Total Recoverable)	<0.10 ug/L	0.10 ug/L
LRB	Beryllium (Total Recoverable)	<0.08 ug/L	0.08 ug/L
LRB	Cadmium (Total Recoverable)	<0.12 ug/L	0.12 ug/L
LRB	Chromium (Total Recoverable)	<0.35 ug/L	0.35 ug/L
LRB	Lead (Total Recoverable)	<0.11 ug/L	0.11 ug/L
LRB	Molybdenum (Total Recoverable)	<0.14 ug/L	0.14 ug/L
LRB	Selenium (Total Recoverable)	<0.44 ug/L	0.44 ug/L
LRB	Thallium (Total Recoverable)	<0.18 ug/L	0.18 ug/L

FD – Field Duplicate

LFB – Laboratory Fortified Blank

LRB – Laboratory Reagent Blank (Method Blank)

QCS – Quality Control Sample

MRL – Minimum Reporting Limit (Verification)

MS – Matrix Spike

MSD – Matrix Spike Duplicate

Underline – Data was outside the limit



Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-43565-1
Client Project/Site: Coal Combustion Rule

For:
Colorado Springs Utilities
Laboratory Services Section
701 E. Las Vegas St., MC 1465
Colorado Springs, Colorado 80903

Attn: Ms. Wendy Asay

Rhonda Ridenhower

Authorized for release by:
11/15/2021 4:46:49 PM

Rhonda Ridenhower, Client Service Manager
(314)298-8566
Rhonda.Ridenhower@Eurofinset.com

Received: 11/16/21 wma
Entered: 11/19/21 wma
Authorized: 11/30/21 kdw

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project
results through
TotalAccess

Have a Question?



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www.eurofinsus.com/Env

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Case Narrative

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Job ID: 160-43565-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

Job Narrative 160-43565-1

Receipt

The samples were received on 10/4/2021 9:17 AM. Unless otherwise noted below, the samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was 21.4° C.

RAD

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date

Methods 904.0: Radium 228

The detection goal was not met for the following sample due to a reduced aliquot, which can be attributed to the presence of matrix interferences: 463144 SC_10 (160-43565-1). Analytical results are reported with the detection limit achieved.

The detection goal was not met for the following sample due to a reduced aliquot, which can be attributed to matrix interference: 463139 FC_2 (160-43565-8). Analytical results are reported with the detection limit achieved.

The following samples were prepared at a reduced aliquot due to Matrix: 463144 SC_10 (160-43565-1), 463145 SC_11 (160-43565-2), 463146 SC_12 (160-43565-3), 463138 FC_1 (160-43565-7), 463137 CC_1 (160-43565-9), 463140 FC_3A (160-43565-10), 463141 FC_3B (160-43565-11) and 463142 FC_3B DUPLICATE (160-43565-12). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 903.0: Radium 226

The following samples were prepared at a reduced aliquot due to Matrix: 463139 FC_2 (160-43565-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

The following samples were prepared at a reduced aliquot due to Matrix: 463144 SC_10 (160-43565-1), 463145 SC_11 (160-43565-2), 463146 SC_12 (160-43565-3), 463138 FC_1 (160-43565-7), 463137 CC_1 (160-43565-9), 463140 FC_3A (160-43565-10), 463141 FC_3B (160-43565-11) and 463142 FC_3B DUPLICATE (160-43565-12). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

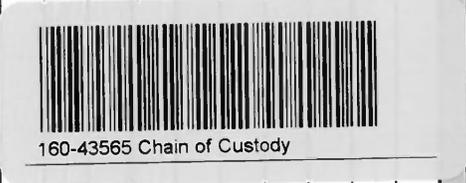
Earth City, MO 63045-1205
phone 314.298.8566 fax 314.298.8757

Regulatory Program: DW NPDES RCRA Other: Coal Combustion Rule

TestAmerica Laboratories, Inc.
COC No: _____ of _____ COCs

Client Contact		Project Manager: Wendy Asay Tel/Fax: 719-649-7796		Site Contact:		Date:	
Colorado Springs Utilities 701 E. Las Vegas St. Colorado Springs, CO 80903 (719) 668-4603 Phone _____ FAX _____ Project Name: Coal Combustion Rule Site: P O #		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below _____ <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Lab Contact: Rhonda Ridenhower Carrier:		COC No: _____ of _____ COCs	
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:

463144	SC_10	9/29/21	0958	G	GW	2	
463145	SC_11	9/29/21	1026	G	GW	2	
463146	SC_12	9/29/21	1054	G	GW	2	
463147	SC_13	9/29/21	1142	G	GW	2	
463148	SC_13 Duplicate	9/29/21	1142	G	GW	2	
463453	SC_14	9/29/21	1303	G	GW	2	
463138	FC_1	9/29/21	1432	G	GW	2	
463139	FC_2	9/29/21	1505	G	GW	2	
463137	CC_1	9/30/21	0955	G	GW	2	
463140	FC_3A	9/30/21	1212	G	GW	2	
463141	FC_3B	9/30/21	1126	G	GW	2	
463142	FC_3B Duplicate	9/30/21	1126	G	GW	2	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification: _____

Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard Flammable Skm Irritant Poison B Unknown

Return to Client Disposal by Lab Archive for _____ Months

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Received by: _____ Company: _____ Date/Time: _____

Received by: _____ Company: _____ Date/Time: _____

Received in Laboratory by: _____ Company: _____ Date/Time: _____

Custody Seal No.: _____

Relinquished by: _____ Company: _____ Date/Time: _____

Relinquished by: _____ Company: _____ Date/Time: _____

Relinquished by: _____ Company: _____ Date/Time: _____



Login Sample Receipt Checklist

Client: Colorado Springs Utilities

Job Number: 160-43565-1

Login Number: 43565

List Source: Eurofins TestAmerica, St. Louis

List Number: 1

Creator: Korrinhizer, Micha L

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Qualifiers

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

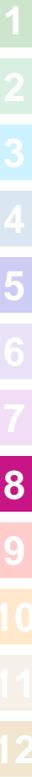


Sample Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-43565-1	463144 SC_10	Water	09/29/21 09:58	10/04/21 09:17
160-43565-2	463145 SC_11	Water	09/29/21 10:26	10/04/21 09:17
160-43565-3	463146 SC_12	Water	09/29/21 10:54	10/04/21 09:17
160-43565-4	463147 SC_13	Water	09/29/21 11:42	10/04/21 09:17
160-43565-5	463148 SC_13 DUPLICATE	Water	09/29/21 11:42	10/04/21 09:17
160-43565-6	463453 SC_14	Water	09/29/21 13:03	10/04/21 09:17
160-43565-7	463138 FC_1	Water	09/29/21 14:32	10/04/21 09:17
160-43565-8	463139 FC_2	Water	09/29/21 15:05	10/04/21 09:17
160-43565-9	463137 CC_1	Water	09/30/21 09:55	10/04/21 09:17
160-43565-10	463140 FC_3A	Water	09/30/21 12:12	10/04/21 09:17
160-43565-11	463141 FC_3B	Water	09/30/21 11:26	10/04/21 09:17
160-43565-12	463142 FC_3B DUPLICATE	Water	09/30/21 11:26	10/04/21 09:17



Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463144 SC_10

Lab Sample ID: 160-43565-1

Date Collected: 09/29/21 09:58

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.305	U <0.758	0.446	0.447	1.00	0.758	pCi/L	10/06/21 12:58	11/03/21 07:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	40.4		40 - 110					10/06/21 12:58	11/03/21 07:46	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.433	U G <1.93	1.11	1.12	1.00	1.93	pCi/L	10/06/21 13:35	10/29/21 17:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	40.4		40 - 110					10/06/21 13:35	10/29/21 17:06	1
Y Carrier	81.5		40 - 110					10/06/21 13:35	10/29/21 17:06	1

Client Sample ID: 463145 SC_11

Lab Sample ID: 160-43565-2

Date Collected: 09/29/21 10:26

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.246	U <0.355	0.228	0.229	1.00	0.355	pCi/L	10/06/21 12:58	11/03/21 07:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	55.4		40 - 110					10/06/21 12:58	11/03/21 07:46	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.389	U <0.967	0.576	0.577	1.00	0.967	pCi/L	10/06/21 13:35	10/29/21 17:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	55.4		40 - 110					10/06/21 13:35	10/29/21 17:09	1
Y Carrier	83.7		40 - 110					10/06/21 13:35	10/29/21 17:09	1

Client Sample ID: 463146 SC_12

Lab Sample ID: 160-43565-3

Date Collected: 09/29/21 10:54

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0586	U <0.205	0.115	0.115	1.00	0.205	pCi/L	10/06/21 12:58	11/03/21 07:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.6		40 - 110					10/06/21 12:58	11/03/21 07:46	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463146 SC_12

Lab Sample ID: 160-43565-3

Date Collected: 09/29/21 10:54

Matrix: Water

Date Received: 10/04/21 09:17

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.259	U <0.690	0.409	0.410	1.00	0.690	pCi/L	10/06/21 13:35	10/29/21 17:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.6		40 - 110					10/06/21 13:35	10/29/21 17:39	1
Y Carrier	72.5		40 - 110					10/06/21 13:35	10/29/21 17:39	1

Client Sample ID: 463147 SC_13

Lab Sample ID: 160-43565-4

Date Collected: 09/29/21 11:42

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0862	U <0.149	0.0925	0.0928	1.00	0.149	pCi/L	10/06/21 12:58	11/03/21 07:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.2		40 - 110					10/06/21 12:58	11/03/21 07:46	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.342	U <0.404	0.259	0.261	1.00	0.404	pCi/L	10/06/21 13:35	10/29/21 17:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.2		40 - 110					10/06/21 13:35	10/29/21 17:09	1
Y Carrier	71.4		40 - 110					10/06/21 13:35	10/29/21 17:09	1

Client Sample ID: 463148 SC_13 DUPLICATE

Lab Sample ID: 160-43565-5

Date Collected: 09/29/21 11:42

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.257	J	0.142	0.144	1.00	0.194	pCi/L	10/06/21 12:58	11/03/21 07:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.0		40 - 110					10/06/21 12:58	11/03/21 07:46	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.350	U <0.432	0.274	0.276	1.00	0.432	pCi/L	10/06/21 13:35	10/29/21 17:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.0		40 - 110					10/06/21 13:35	10/29/21 17:09	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463148 SC_13 DUPLICATE

Lab Sample ID: 160-43565-5

Date Collected: 09/29/21 11:42

Matrix: Water

Date Received: 10/04/21 09:17

Method: 904.0 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Y Carrier	78.5		40 - 110	10/06/21 13:35	10/29/21 17:09	1

Client Sample ID: 463453 SC_14 463153

Lab Sample ID: 160-43565-6

Date Collected: 09/29/21 13:03

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0607	U <0.164	0.0957	0.0959	1.00	0.164	pCi/L	10/06/21 12:58	11/03/21 07:47	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	103		40 - 110	10/06/21 12:58	11/03/21 07:47	1				
Y Carrier	75.1		40 - 110	10/06/21 12:58	11/03/21 07:47	1				

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.529	J	0.280	0.284	1.00	0.413	pCi/L	10/06/21 13:35	10/29/21 17:10	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	103		40 - 110	10/06/21 13:35	10/29/21 17:10	1				
Y Carrier	75.1		40 - 110	10/06/21 13:35	10/29/21 17:10	1				

Client Sample ID: 463138 FC_1

Lab Sample ID: 160-43565-7

Date Collected: 09/29/21 14:32

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.02		0.255	0.271	1.00	0.242	pCi/L	10/06/21 12:58	11/03/21 07:47	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	103		40 - 110	10/06/21 12:58	11/03/21 07:47	1				

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.85		0.466	0.496	1.00	0.555	pCi/L	10/06/21 13:35	10/29/21 17:09	1
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
Ba Carrier	103		40 - 110	10/06/21 13:35	10/29/21 17:09	1				
Y Carrier	72.9		40 - 110	10/06/21 13:35	10/29/21 17:09	1				

Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463139 FC_2

Lab Sample ID: 160-43565-8

Date Collected: 09/29/21 15:05

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0664	U <0.198	0.115	0.115	1.00	0.198	pCi/L	10/06/21 12:58	11/03/21 07:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.6		40 - 110					10/06/21 12:58	11/03/21 07:49	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.880	U G <1.47	0.902	0.905	1.00	1.47	pCi/L	11/01/21 11:38	11/05/21 16:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		40 - 110					11/01/21 11:38	11/05/21 16:03	1
Y Carrier	75.5		40 - 110					11/01/21 11:38	11/05/21 16:03	1

Client Sample ID: 463137 CC_1

Lab Sample ID: 160-43565-9

Date Collected: 09/30/21 09:55

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.355	J	0.173	0.176	1.00	0.224	pCi/L	10/06/21 12:58	11/03/21 07:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.1		40 - 110					10/06/21 12:58	11/03/21 07:49	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.935	J	0.450	0.458	1.00	0.658	pCi/L	10/06/21 13:35	10/29/21 17:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.1		40 - 110					10/06/21 13:35	10/29/21 17:08	1
Y Carrier	72.9		40 - 110					10/06/21 13:35	10/29/21 17:08	1

Client Sample ID: 463140 FC_3A

Lab Sample ID: 160-43565-10

Date Collected: 09/30/21 12:12

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0532	U <0.233	0.129	0.129	1.00	0.233	pCi/L	10/06/21 12:58	11/03/21 07:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					10/06/21 12:58	11/03/21 07:49	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463140 FC_3A

Lab Sample ID: 160-43565-10

Date Collected: 09/30/21 12:12

Matrix: Water

Date Received: 10/04/21 09:17

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.277	U <0.750	0.445	0.446	1.00	0.750	pCi/L	10/06/21 13:35	10/29/21 17:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					10/06/21 13:35	10/29/21 17:02	1
Y Carrier	71.8		40 - 110					10/06/21 13:35	10/29/21 17:02	1

Client Sample ID: 463141 FC_3B

Lab Sample ID: 160-43565-11

Date Collected: 09/30/21 11:26

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.150	U <207	0.134	0.135	1.00	0.207	pCi/L	10/06/21 12:58	11/03/21 09:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					10/06/21 12:58	11/03/21 09:36	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.709	J	0.404	0.409	1.00	0.606	pCi/L	10/06/21 13:35	10/29/21 17:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					10/06/21 13:35	10/29/21 17:02	1
Y Carrier	71.4		40 - 110					10/06/21 13:35	10/29/21 17:02	1

Client Sample ID: 463142 FC_3B DUPLICATE

Lab Sample ID: 160-43565-12

Date Collected: 09/30/21 11:26

Matrix: Water

Date Received: 10/04/21 09:17

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.427	J	0.180	0.184	1.00	0.213	pCi/L	10/06/21 12:58	11/03/21 09:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.1		40 - 110					10/06/21 12:58	11/03/21 09:36	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.791	J	0.445	0.451	1.00	0.672	pCi/L	10/06/21 13:35	10/29/21 17:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.1		40 - 110					10/06/21 13:35	10/29/21 17:02	1

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Client Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Client Sample ID: 463142 FC_3B DUPLICATE

Lab Sample ID: 160-43565-12

Date Collected: 09/30/21 11:26

Matrix: Water

Date Received: 10/04/21 09:17

Method: 904.0 - Radium-228 (GFPC) (Continued)

<u>Carrier</u>	<u>%Yield</u>	<u>Qualifier</u>	<u>Limits</u>
Y Carrier	72.5		40 - 110

<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
10/06/21 13:35	10/29/21 17:02	1

QC Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-530435/22-A
Matrix: Water
Analysis Batch: 534853

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 530435

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	-0.02510	U	0.118	0.118	1.00	0.245	pCi/L	10/06/21 12:58	11/03/21 09:38	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	85.5		40 - 110					10/06/21 12:58	11/03/21 09:38	1

Lab Sample ID: LCS 160-530435/1-A
Matrix: Water
Analysis Batch: 534853

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 530435

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	15.1	12.78		1.40	1.00	0.218	pCi/L	85	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits		Prepared	Analyzed	Dil Fac		
Ba Carrier	96.9		40 - 110					10/06/21 12:58	11/03/21 09:38	1

Lab Sample ID: LCSD 160-530435/2-A
Matrix: Water
Analysis Batch: 534853

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 530435

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER
				Uncert. (2σ+/-)							Limit
Radium-226	15.1	14.17		1.54	1.00	0.248	pCi/L	94	75 - 125	0.47	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits		Prepared	Analyzed	Dil Fac				
Ba Carrier	90.7		40 - 110					10/06/21 13:35	10/29/21 17:04	1	

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-530438/22-A
Matrix: Water
Analysis Batch: 534290

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 530438

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.05138	U	0.323	0.323	1.00	0.571	pCi/L	10/06/21 13:35	10/29/21 17:04	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	85.5		40 - 110					10/06/21 13:35	10/29/21 17:04	1
Y Carrier	90.8		40 - 110		10/06/21 13:35	10/29/21 17:04	1			

QC Sample Results

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-530438/1-A
Matrix: Water
Analysis Batch: 534292

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 530438

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									75	125
Radium-228	12.3	11.59		1.40	1.00	0.516	pCi/L	95	75 - 125	
LCS LCS										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	96.9		40 - 110							
Y Carrier	81.1		40 - 110							

Lab Sample ID: LCSD 160-530438/2-A
Matrix: Water
Analysis Batch: 534292

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 530438

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
									75	125	0.52	1
Radium-228	12.3	13.24		1.79	1.00	1.11	pCi/L	108	75 - 125	0.52	1	
LCSD LCSD												
Carrier	%Yield	Qualifier	Limits									
Ba Carrier	90.7		40 - 110									
Y Carrier	53.8		40 - 110									

Lab Sample ID: MB 160-534487/5-A
Matrix: Water
Analysis Batch: 535230

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 534487

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared		Analyzed		Dil Fac
								11/01/21 11:38	11/05/21 16:03	11/01/21 11:38	11/05/21 16:03	1
Radium-228	0.4721		0.295	0.298	1.00	0.446	pCi/L	11/01/21 11:38	11/05/21 16:03	11/01/21 11:38	11/05/21 16:03	1
MB MB												
Carrier	%Yield	Qualifier	Limits		Prepared		Analyzed		Dil Fac			
Ba Carrier	76.5		40 - 110		11/01/21 11:38		11/05/21 16:03		1			
Y Carrier	77.0		40 - 110		11/01/21 11:38		11/05/21 16:03		1			

Lab Sample ID: LCS 160-534487/1-A
Matrix: Water
Analysis Batch: 535230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 534487

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									75	125
Radium-228	9.17	9.863		1.19	1.00	0.404	pCi/L	108	75 - 125	
LCS LCS										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	72.0		40 - 110							
Y Carrier	84.1		40 - 110							

QC Sample Results

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-534487/2-A
Matrix: Water
Analysis Batch: 535230

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 534487

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	
									Min	Max	RER	Limit
Radium-228	9.17	10.00		1.17	1.00	0.418	pCi/L	109	75	125	0.06	1

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	87.8		40 - 110
Y Carrier	82.2		40 - 110



QC Association Summary

Client: Colorado Springs Utilities
Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Rad

Prep Batch: 530435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-43565-1	463144 SC_10	Total/NA	Water	PrecSep-21	
160-43565-2	463145 SC_11	Total/NA	Water	PrecSep-21	
160-43565-3	463146 SC_12	Total/NA	Water	PrecSep-21	
160-43565-4	463147 SC_13	Total/NA	Water	PrecSep-21	
160-43565-5	463148 SC_13 DUPLICATE	Total/NA	Water	PrecSep-21	
160-43565-6	463453 SC_14	Total/NA	Water	PrecSep-21	
160-43565-7	463138 FC_1	Total/NA	Water	PrecSep-21	
160-43565-8	463139 FC_2	Total/NA	Water	PrecSep-21	
160-43565-9	463137 CC_1	Total/NA	Water	PrecSep-21	
160-43565-10	463140 FC_3A	Total/NA	Water	PrecSep-21	
160-43565-11	463141 FC_3B	Total/NA	Water	PrecSep-21	
160-43565-12	463142 FC_3B DUPLICATE	Total/NA	Water	PrecSep-21	
MB 160-530435/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-530435/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-530435/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 530438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-43565-1	463144 SC_10	Total/NA	Water	PrecSep_0	
160-43565-2	463145 SC_11	Total/NA	Water	PrecSep_0	
160-43565-3	463146 SC_12	Total/NA	Water	PrecSep_0	
160-43565-4	463147 SC_13	Total/NA	Water	PrecSep_0	
160-43565-5	463148 SC_13 DUPLICATE	Total/NA	Water	PrecSep_0	
160-43565-6	463453 SC_14	Total/NA	Water	PrecSep_0	
160-43565-7	463138 FC_1	Total/NA	Water	PrecSep_0	
160-43565-9	463137 CC_1	Total/NA	Water	PrecSep_0	
160-43565-10	463140 FC_3A	Total/NA	Water	PrecSep_0	
160-43565-11	463141 FC_3B	Total/NA	Water	PrecSep_0	
160-43565-12	463142 FC_3B DUPLICATE	Total/NA	Water	PrecSep_0	
MB 160-530438/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-530438/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-530438/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 534487

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-43565-8	463139 FC_2	Total/NA	Water	PrecSep_0	
MB 160-534487/5-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-534487/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-534487/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Tracer/Carrier Summary

Client: Colorado Springs Utilities
 Project/Site: Coal Combustion Rule

Job ID: 160-43565-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
160-43565-1	463144 SC_10	40.4	
160-43565-2	463145 SC_11	55.4	
160-43565-3	463146 SC_12	89.6	
160-43565-4	463147 SC_13	99.2	
160-43565-5	463148 SC_13 DUPLICATE	94.0	
160-43565-6	463453 SC_14	103	
160-43565-7	463138 FC_1	103	
160-43565-8	463139 FC_2	81.6	
160-43565-9	463137 CC_1	95.1	
160-43565-10	463140 FC_3A	88.1	
160-43565-11	463141 FC_3B	98.2	
160-43565-12	463142 FC_3B DUPLICATE	95.1	
LCS 160-530435/1-A	Lab Control Sample	96.9	
LCSD 160-530435/2-A	Lab Control Sample Dup	90.7	
MB 160-530435/22-A	Method Blank	85.5	

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
160-43565-1	463144 SC_10	40.4	81.5
160-43565-2	463145 SC_11	55.4	83.7
160-43565-3	463146 SC_12	89.6	72.5
160-43565-4	463147 SC_13	99.2	71.4
160-43565-5	463148 SC_13 DUPLICATE	94.0	78.5
160-43565-6	463453 SC_14	103	75.1
160-43565-7	463138 FC_1	103	72.9
160-43565-8	463139 FC_2	87.0	75.5
160-43565-9	463137 CC_1	95.1	72.9
160-43565-10	463140 FC_3A	88.1	71.8
160-43565-11	463141 FC_3B	98.2	71.4
160-43565-12	463142 FC_3B DUPLICATE	95.1	72.5
LCS 160-530438/1-A	Lab Control Sample	96.9	81.1
LCS 160-534487/1-A	Lab Control Sample	72.0	84.1
LCSD 160-530438/2-A	Lab Control Sample Dup	90.7	53.8
LCSD 160-534487/2-A	Lab Control Sample Dup	87.8	82.2
MB 160-530438/22-A	Method Blank	85.5	90.8
MB 160-534487/5-A	Method Blank	76.5	77.0

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier