

June 2021

Off-Post

Quarterly Groundwater Monitoring Report



Prepared For

**Department of the Army
Camp Stanley Storage Activity
Boerne, Texas**

August 2021

EXECUTIVE SUMMARY

- Six off-post samples were collected during the June 2021 sampling event for volatile organic compound (VOC) analyses.
- Analyses indicated one off-post well, RFR-10, exceeded the maximum contaminant level (MCL) for volatile organic compounds (VOCs). This well is equipped with GAC filtration systems.
- Wells LS-5, OFR-3, and RFR-11 had VOC detections above the RL (reporting limit) but below the MCL this sampling event. These wells are also equipped with GAC filtration systems.
- GAC-filtered samples were not collected in June 2021 as part of the groundwater monitoring program. GAC filtered samples are collected semi-annually and after GAC maintenance and will be collected again in September 2021.
- Semi-annual GAC maintenance was performed April 1, 2021. This involved replacing the first carbon canister in each GAC system and other routine maintenance. Seven GAC filtered samples were collected on April 5, 2021 after GAC maintenance, all samples were non-detect indicating the filtration systems remain effective. This carbon exchange is performed semi-annually; the next carbon change-out is due in October 2021.

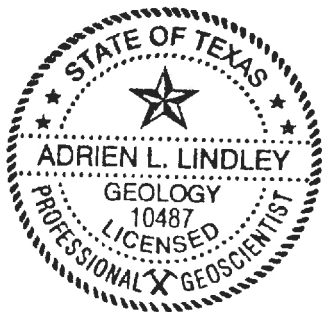
GEOSCIENTIST CERTIFICATION


June 2021 Off-Post Quarterly Groundwater Monitoring Report

For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

I, Adrien Lindley, Professional Geologist (P.G.), hereby certify that the 2021 June Off-Post Quarterly Groundwater Monitoring Report for the Camp Stanley Storage Activity installation in Boerne, Texas accurately represents the site conditions of the subject area. This certification is limited only to geoscientific products contained in the subject report and is made on the basis of written and oral information provided by the Camp Stanley Storage Activity Environmental Office, laboratory data provided by APPL, and field data obtained during groundwater monitoring conducted at the site in June 2021, and is true and accurate to the best of my knowledge and belief.





Adrien Lindley, P.G.
State of Texas
Geology License No. 10487
9/15/2021

Date

Parsons Government Services, Inc.
Firm Registration No. 50316

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ABBREVIATIONS AND ACRONYMS

µg/L	microgram per liter
AOC	Area of Concern
APPL	Agriculture and Priority Pollutants Laboratories, Inc.
<i>cis</i> -1,2-DCE	<i>cis</i> -1,2-Dichloroethene
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objective
FD	Field Duplicate
GAC	Granular Activated Carbon
HASP	Health and Safety Plan
JW	Jackson Woods
LS	Leon Springs
LTMO	Long Term Monitoring Optimization
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Applicable
OFR	Old Fredericksburg Road
Parsons	Parsons Government Services, Inc.
PCE	Tetrachloroethene
P.G.	Professional Geologist
Plan	Off-Post Monitoring Program and Response Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RFR	Ralph Fair Road
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SLD	Scenic Loop Drive
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

JUNE 2021
OFF-POST GROUNDWATER MONITORING REPORT
CAMP STANLEY STORAGE ACTIVITY

1.0 INTRODUCTION

This report presents results from the off-post quarterly sampling performed for Camp Stanley Storage Activity (CSSA) in June 2021 as required by the Administrative Order on Consent dated May 5, 1999. The purpose of this report is to present a summary of the sampling results. Results from all four 2021 quarterly monitoring events (March, June, September, and December) will be described in detail in an Annual Report to be submitted after December 2021. The Annual Report will also provide an interpretation of all analytical results and an evaluation of any temporal or spatial trends observed in the groundwater contaminant plume during investigations.

Groundwater monitoring was performed March 2nd through 11th, 2021. The quarterly off-post groundwater monitoring program was initiated in September 2001 in accordance with the **Off-Post Monitoring Program and Response Plan (CSSA, 2002)**, herein referred to as the “Plan”. Action levels for detection of volatile organic compounds (VOCs) and the rationale for sampling off-post wells are described in the Plan.

The CSSA groundwater monitoring program also follows the provisions of the groundwater monitoring program data quality objectives (DQOs) as well as the recommendations of all applicable project-specific work plans. **Appendix A** provides an evaluation of the DQO attainment for this sampling event. Approval for the updated DQOs and the long-term monitoring optimization (LTMO) was received from the Texas Commission on Environmental Quality (TCEQ) on September 18, 2020 and the United States Environmental Protection Agency (USEPA) on September 23 & 18, 2020. The sampling schedule provided in the 2020 LTMO update was implemented during the December 2020 sampling event.

The primary objective of the off-post groundwater monitoring program is to determine whether concentrations of chlorinated VOCs detected in off-post public and private drinking water wells exceed safe drinking water standards. Other objectives are to determine the lateral and vertical extent of the contaminant plumes and identify trends (decreasing or increasing) in contaminant levels over time in the sampled wells.

2.0 JUNE 2021 ANALYTICAL RESULTS

During the June 2021 event, groundwater samples were collected from 6 off-post wells shown in **Figure 2.1**. Seven granular activated carbon (GAC) filtered samples (LS-5-A2, LS-6-A2, LS-7-A2, OFR-3-A2, RFR-10-A2, RFR-10-B2, and RFR-11-A2) are collected semi-annually (March and September), and were not collected during this event.

Table 2.1 includes the rationale for selection of the 6 wells scheduled to be sampled in June 2021. These included:

- Three privately owned wells in the Leon Springs Villa area (LS-5, LS-6, and LS-7);
- One privately-owned well on Old Fredericksburg Road (OFR-3);
- Two privately-owned wells (RFR-10 and RFR-11) in the Ralph Fair Road area.

A total of 6 groundwater samples, one trip blank, one field duplicate (FD), and one matrix spike/matrix spike duplicate (MS/MSD) included with the on-post data groups were submitted to Agriculture & Priority Pollutant Laboratories, Inc. (APPL) in Clovis, California for analysis. Groundwater samples were analyzed for the short list of VOCs using SW-846 Method 8260B. The approved short list of VOCs includes *cis*-1,2-dichloroethene (*cis*-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride.

The data package (Parsons Government Services, Inc. [Parsons] internal reference CS12FF-#59) contains the analytical results for this sampling event and are presented in **Appendix C**. Laboratory results were reviewed and verified according to the guidelines outlined in the CSSA Quality Assurance Project Plan (QAPP), Version 1.0. Parsons received these data packages on July 16th, 2021.

All active wells with submersible pumps were sampled from a tap located as close to the wellhead as possible. Most taps were previously installed by CSSA to obtain a representative groundwater sample before pressurization or storage of groundwater in the water supply distribution system. Water was purged to engage the well pump prior to sample collection. Conductivity, pH, and temperature readings were recorded to confirm adequate purging while the well was pumping. Generally, this required an average of 20 gallons to be purged prior to sample collection.

Concentrations of the VOCs detected in June 2021 are presented in **Table 2.2**. Full analytical results from the June 2021 sampling event are presented in **Appendix B**. As shown in **Table 2.1**, 6 samples were scheduled for collection in June 2021 and all samples were obtained.



0 0.25 0.5
Miles

Sampled Wells June 2021

- > MCL (VOC's) only
- > RL (VOC's) only
- > MDL (VOC's) only
- ND

Figure 2-1

On-Post and Off-Post Well Sampling
Locations for June 2021

Camp Stanley Storage Activity

PARSONS

Table 2.2
June 2021 Off-Post Groundwater Results, Detected Analytes Only

Subdivision	Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
Leon Springs Villas	LS-5	6/2/2021	--	1.07F	4.21	--
	LS-6	6/2/2021	--	0.51F	--	--
	LS-7	6/2/2021	--	0.65F	--	--
Old Fredericksburg Road	OFR-3	6/2/2021	--	4.50	3.26	--
Ralph Fair Road	RFR-10	6/2/2021	--	6.30	4.93	--
	RFR-10 FD	6/2/2021	--	6.13	5.12	--
	RFR-11	6/2/2021	--	1.61	--	--
Laboratory Detection Limits & Maximum Contaminant Level						
Method Detection Limit (MDL)			0.07	0.06	0.05	0.08
Reporting Limit (RL)			1.2	1.4	1	1.1
Max. Contaminant Level (MCL)			70	5	5	2

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
 VOC data reported in ug/L.

Abbreviations/Notes:
 TCE Trichloroethene
 PCE Tetrachloroethene
 DCE Dichloroethene
 FD Field Duplicate

Data Qualifiers:
 --The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
 F-The analyte was positively identified but the associated numerical value is below the RL.

One well (RFR-10) exceeded the Maximum Contaminant Level (MCL) of 5 micrograms per liter ($\mu\text{g/L}$) in June 2021 for PCE. PCE and/or TCE was detected above the Reporting Limits (RLs) in private drinking water wells LS-5, OFR-3, and RFR-11. These wells are equipped with GAC filtration systems. Vinyl chloride and *cis*-1,2-DCE were not detected in any of the off-post wells sampled in June 2021.

On April 1, 2021, routine semi-annual maintenance was performed on the GAC treatment systems at LS-5, LS-6, LS-7, OFR-3, RFR-10, and RFR-11. Carbon canisters were exchanged and other routine maintenance was performed. Follow up GAC-filtered sampling after GAC maintenance performed on April 5, 2021 were non-detect indicating the GAC systems are functioning properly. GAC-filtered samples will be collected again during the September 2021 event.

Based on historical detections, the lateral extent of VOC detections extends beyond the south and west boundaries of CSSA. Past detections of VOCs have extended 0.37 miles south to well LS-4 and 2.9 miles west towards Scenic Loop Drive (SLD) at well SLD-01. Detections above the RL ($1.4 \mu\text{g/L}$) and MCL ($5 \mu\text{g/L}$) however, are confined to within 0.5 miles of the southwest corner of CSSA. VOC detections beyond that distance range between 1% and 28% of the regulatory MCL thresholds of $5 \mu\text{g/L}$ for PCE and TCE and are therefore considered trace detections. The CSSA action levels that trigger the requirement for installation of wellhead protection on water supply wells for both PCE and TCE are 80% of the MCL ($4 \mu\text{g/L}$), and the furthest historical detection exceeding the action level is 0.43 miles from the southwest corner of the post (and 0.32 miles to the closest point along the CSSA boundary).

3.0 SUMMARY AND RECOMMENDATIONS

Results of the June 2021 sampling event are summarized as follows:

- Six samples scheduled for collection in June 2021 were obtained during the quarterly monitoring event.
- One well (RFR-10) exceeded the MCL for PCE in June 2021. TCE also exceeded the MCL in the field duplicate. This well has a GAC filtration system in place.
- TCE and/or PCE was detected above the RL in private drinking water wells LS-5, OFR-3, and RFR-11. These wells have GAC filtration systems in place.
- Vinyl chloride and cis-1,2-DCE were not detected in any of the off-post wells sampled in June 2021.
- GAC-filtered samples were not collected as part of the quarterly groundwater monitoring in June 2021. GAC-filtered samples are collected semiannually, every March and September and following GAC maintenance. The next GAC-filtered samples will be collected in September 2021.
- Semi-annual GAC maintenance, including carbon change-out, was performed April 1, 2021. GAC filtered samples were collected April 5th following this maintenance. All samples were non-detect indicating the GAC filtration systems are functioning properly. The next semi-annual GAC maintenance is due in October 2021.
- The 2020 update to the LTMO and DQOs was accepted by the TCEQ on September 18, 2020 and the EPA on September 18th and September 23, 2020, respectively.
- In accordance with the recently updated project DQOs and LTMO schedule, the rationale for the selection of 13 samples to be collected in September 2021 is provided in **Table 3.1**.

**APPENDIX A
EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT**

Activity	Objectives	Action	Objective Attained?	Recommendations
Field Sampling	Conduct field sampling in accordance with procedures defined in the project work plan, SAP, QAPP, and HASP.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes	NA
Contamination Characterization (Groundwater Contamination)	Determine the potential extent of off-post contamination (§2.1 of the DQOs for the Groundwater Contamination Investigation, revised April 2020).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a ½ mile radius of CSSA.	Partially	Replace wells where no VOCs were detected with wells that may be identified in the future, located to the west and southwest of Area of Concern (AOC)-65 to provide better definition of Plume 2. Continue sampling of wells to the west of Plume 1 (Fair Oaks and Jackson Woods) to confirm any detections possibly related to Plume 1.
	Meet CSSA QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP, and approved variances. A chemist verified all data.	Yes	NA
		All data flagged with a “U” and “J” are usable for characterizing contamination.	Yes	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
	<p>Evaluate CSSA monitoring program and expand as necessary (§2.1 of the DQOs for the Groundwater Contamination Investigation, revised April 2020). Determine locations of future monitoring locations.</p>	<p>Evaluation of data collected is ongoing and is reported in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.</p>	<p>Yes</p>	<p>Continue data evaluation and quarterly teleconferences for evaluation of the monitoring program. Each teleconference / planning session covers expansion of the quarterly monitoring program, if necessary.</p>
<p>Project Schedule/ Reporting</p>	<p>The quarterly monitoring project schedule shall provide a schedule for sampling, analysis, validation, verification, reviews, and reports for monitoring events off-post.</p>	<p>A schedule for sampling, analysis, validation, verification and data review, and reports is provided in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.</p>	<p>Yes</p>	<p>Continue quarterly reporting to include a schedule for sampling, analysis, validation, and verification and data review and data reports.</p>

Activity	Objectives	Action	Objective Attained?	Recommendations
Remediation	Evaluate the effectiveness of GACs and install as needed (§3.2 both of the DQOs for the Groundwater Contamination Investigation, revised April 2020).	Perform maintenance as needed. Install new GACs as needed.	Yes	Maintenance of the off-post GAC systems to be continued by Parsons' personnel every 3 weeks. Twice yearly (or as needed) maintenance to the off-post GAC systems by additional subcontractors to continue. Evaluations of future sampling results for installation of new GAC systems will occur as needed.

**APPENDIX B
JUNE 2021 QUARTERLY OFF-POST
GROUNDWATER ANALYTICAL RESULTS**

Appendix B
June 2021 Quarterly Off-post Groundwater Analytical Results

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
LS-5	6/2/2021	0.07U	1.07F	4.21	0.08U
LS-6	6/2/2021	0.07U	0.51F	0.05U	0.08U
LS-7	6/2/2021	0.07U	0.65F	0.05U	0.08U
OFR-3	6/2/2021	0.07U	4.50	3.26	0.08U
RFR-10	6/2/2021	0.07U	6.30	4.93	0.08U
RFR-10 FD	6/2/2021	0.07U	6.13	5.12	0.08U
RFR-11	6/2/2021	0.07U	1.61	0.05U	0.08U
Laboratory Detection Limits & Maximum Contaminant Level					
Method Detection Limit (MDL)		0.07	0.06	0.05	0.08
Reporting Limit (RL)		1.2	1.4	1	1.1
Max. Contaminant Level (MCL)		70	5	5	2

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.

VOC data reported in ug/L.

Abbreviations/Notes:

TCE Trichloroethene
PCE Tetrachloroethene
DCE Dichloroethene
FD Field Duplicate

Data Qualifiers:

U-The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.

F-The analyte was positively identified but the associated numerical value is below the RL.

**APPENDIX C
DATA VALIDATION REPORTS**

SDG 96444

DATA VERIFICATION SUMMARY REPORT
for groundwater samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Sandra de las Fuentes
Parsons - Austin

INTRODUCTION

The following data verification summary report covers five water samples collected from Camp Stanley Storage Activity (CSSA) June 2 and 3, 2021. The samples were assigned to the following Sample Delivery Group (SDG).

96444

The field QC sample associated with this SDG was one trip blank (TB), one matrix spike/matrix spike duplicate (MS/MSD) set, and one field duplicate (FD). No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary, due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. Samples in this SDG were shipped to the laboratory in a single cooler, which was received by the laboratory at an acceptable temperature of -2.3°C.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	VOCs	Metals	Mercury	Comments
TB-1	Water	X			
LS-7	Water	X			
LS-5	Water	X			
LS-6	Water	X			
OFR-3	Water	X			
RFR-10	Water	X			
RFR-10-FD	Water	X			FD of RFR-10
RFR-11	Water	X			
CS-12	Water	X	X	X	
CS-1	Water	X	X	X	
CS-10	Water	X	X	X	
CS-13	Water	X	X	X	MS/MSD

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
VOCS	WATER	SW5030B	SW8260B	µg/L
METALS	WATER	SW3010A	SW6010B	mg/L
MERCURY	WATER	SW7470A	SW7470A	mg/L

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

VOLATILES

General

The volatiles portion of this data package consisted of ten (10) groundwater samples, one (1) TB, one (1) MS/MSD set and one (1) FD. All samples were collected on June 2 and 3, 2021 and analyzed for a reduced list of VOCs which included: *cis*-1,2-dichloroethene (*cis* 1,2-DCE), tetrachloroethene, trichloroethene (TCE), and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in two analytical batches, #265703 and #265706, under one initial calibration (ICAL). All samples were analyzed following the procedures outlined in the CSSA QAPP and were prepared and analyzed within the holding time required by the method. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), MS/MSD, and the surrogate spikes. Sample CS-13 was designated as the MS/MSD on the COC.

The LCS, MS/MSD, and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD results. Precision was further evaluated by comparing the field duplicate analyte results. Sample FRF-10-FD was collected and analyzed as the field duplicate of FRF-10.

The MS/MSD RPDs were within acceptance criteria.

All target metals that were detected above the reporting limit (RL) in the parent and FD samples, met criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank and TB for cross contamination of samples during sample collection, transportation, and analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met. The ICV was prepared using a secondary source standard.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

Two method blanks were associated with the VOC analyses in this SDG. The MB was non-detect for all target VOCs.

There was one trip blank sample associated with the VOC analyses in this SDG. The TB was also non-detect for all target VOCs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All VOC results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

ICP-AES METALS

General

The ICP-AES portion of this SDG consisted of four (4) groundwater samples and one (1) MS/MSD. All samples were collected on June 2 and 3, 2021. The samples were analyzed for arsenic, barium, cadmium, chromium, copper, lead, and zinc.

The ICP-AES metals analyses were performed using USEPA SW846 Method 6010B. All samples were analyzed following the procedures outlined in the CSSA QAPP and were prepared and analyzed within the holding time required by the method.

The samples for ICP-AES metals were digested in batch #265755. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS, MS, and MSD. Sample CS-13 was designated as the MS/MSD on the COC.

All LCS, MS, and MSD recoveries were within acceptance.

Precision

Precision was measured based on the RPD of MS/MSD results and parent/FD sample results. There were no samples designated for MS/MSD purposes on the COC.

All RPDs were compliant for the MS/MSD.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating preservation and holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

All samples were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0, prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- Dilution test (DT) was not applicable since all target metals met criteria in the MS/MSD.
- Post digestion spike (PDS) was also not applicable since all target metals met criteria in the MS/MSD samples.
- The initial calibration blank (ICB) and continuing calibration blank (CCB) samples were all non-detect, except for a trace cadmium detection in a CCB. No action was required since the cadmium detections in the associated samples were greater than 5 times the concentration in the CCB.

One method blank was analyzed in association with the ICP-AES analyses in this SDG. The method blank was free of target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP-AES metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERCURY

General

The mercury portion of this SDG consisted of four (4) groundwater samples and one (1) MS/MSD set. All samples were collected on June 2 and 3, 2021 and were analyzed for mercury.

The mercury analyses were performed using USEPA SW846 Method 7470A. The sample was analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed within the holding time required by the method.

The mercury samples were prepared in batch #265620. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS and MS/MSD. Sample CS-13 was designated as the MS/MSD on the COC.

The LCS and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was measured based on the RPD of MS/MSD results and parent/FD sample results. There were no samples designated for MS/MSD purposes on the COC.

The RPD was compliant for the MS/MSD.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

All samples were analyzed following the COC and the analytical procedures described in the CSSA QAPP, prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.

There was one method blank and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Mercury result for the samples in this SDG was considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.