

September 2015

Off-Post

Quarterly Groundwater Monitoring Report



Prepared For

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

November 2015

EXECUTIVE SUMMARY

- A total of 7 off-post wells and 7 granular activated carbon (GAC) filtered samples were collected during the September 2015 sampling event.
- Analyses indicated off-post well RFR-10 and OFR-3 exceeded the maximum contaminant level (MCL) for tetrachloroethene (PCE) and/or trichloroethene (TCE). These wells are equipped with GAC filtration systems.
- GAC-filtered samples were collected in September 2015. All sample results were non-detect indicating the GAC systems are functioning properly. The next scheduled GAC-filtered samples will be collected in March 2016.
- Semi-annual GAC maintenance was performed August 26, 2015. This involved replacing the first carbon canister in each GAC system and other routine maintenance. This carbon exchange is performed semi-annually; the next carbon change-out will be due in February 2016.
- The data quality objectives (DQOs) and the long term monitoring optimization (LTMO) have been submitted to the Texas Commission on Environmental Quality (TCEQ) and United States Environmental Protection Agency (USEPA) for approval.

GEOSCIENTIST CERTIFICATION

September 2015 Off-Post Quarterly Groundwater Monitoring Report

For

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

I, W. Scott Pearson, Professional Geologist (P.G.), hereby certify that the 2015 September 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 September 2015, and is true and accurate to the best of my knowledge and belief.

W. Scott Pearson, P.G.
State of Texas
Geology License No. 2186

Date

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ABBREVIATIONS AND ACRONYMS

µg/L	microgram per liter
1,1-DCE	1,1-dichloroethene
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
HSP	Health and Safety Plan
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
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

**SEPTEMBER 2015
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 September 2015 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 2015 quarterly monitoring events (March, June, September, and December) will be described in detail in an Annual Report to be submitted after December 2015. 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 September 8 through 23, 2015. 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. Currently, the DQOs and the long term monitoring optimization (LTMO) are under revision and will be submitted to the Texas Commission on Environmental Quality (TCEQ) and United States Environmental Protection Agency (USEPA) for approval.

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 SEPTEMBER 2015 ANALYTICAL RESULTS

During the September 2015 event, groundwater samples were collected from 7 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 also collected during this event.

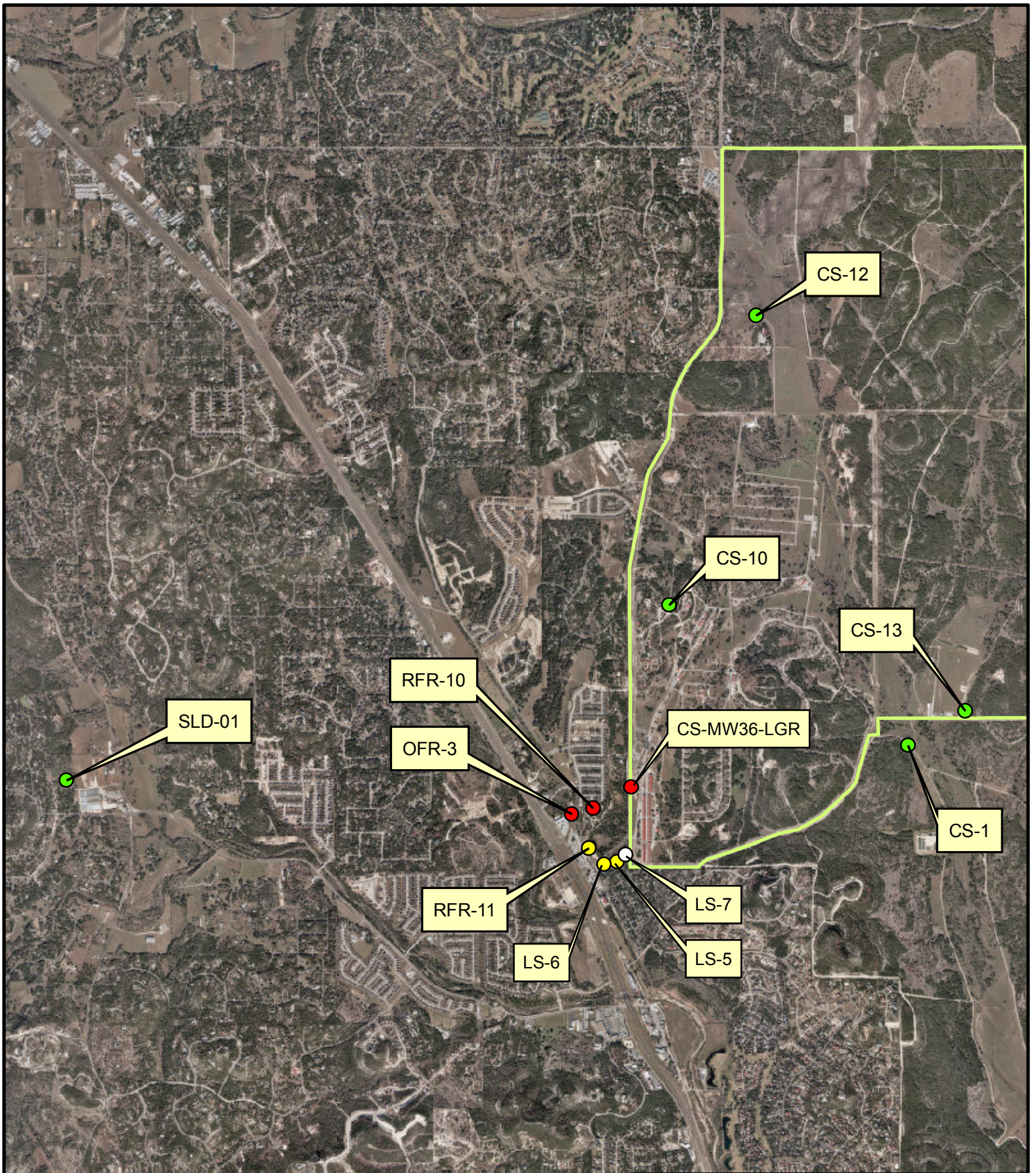
Table 2.1 includes the rationale for selection of the wells to be sampled in September 2015, and **Figure 2.1** provides well locations for the following sampled wells:

- Three privately-owned wells in the Leon Springs (LS) Villa area: LS-5, LS-6, and LS-7;
- One privately-owned well on Old Fredericksburg Road (OFR) (OFR-3).
- Two privately-owned wells in the Ralph Fair Road (RFR) area (RFR-10 and RFR-11);
- One public supply wells in the Scenic Loop Drive (SLD) area, SLD-01.

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.

A total of 14 groundwater samples, two trip blanks, 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 Laboratory (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), *trans*-1,2-DCE, 1,1-DCE, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride.

The data packages (Parsons Government Services, Inc. (Parsons) internal reference 810000-#63 and #67) contain 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 data packages September 28 through October 8, 2015.



Sep2015_Sampled_Wells

- > 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 September 2015
Camp Stanley Storage Activity

PARSONS

Concentrations of the VOCs detected in September 2015 are presented in **Table 2.2**. Full analytical results from the September 2015 sampling event are presented in **Appendix B**. As shown in **Table 2.1**, all 14 samples that were scheduled for collection in September 2015 were obtained.

In August 2015, 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. GAC-filtered samples were collected this quarter and are scheduled to be collected again during the March 2016 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 to SLD-01 (**Figure 2.1**).

Table 2.2
September 2015 Off-Post Groundwater Results, Detected Analytes Only

Subdivision	Well ID	Sample Date	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride
Leon Springs Villas	LS-5	9/8/2015	--	--	--	0.83F	2.43	--
	LS-5-A2	9/8/2015	--	--	--	--	--	--
	LS-6	9/8/2015	--	--	--	0.62F	2.04	--
	LS-6-A2	9/8/2015	--	--	--	--	--	--
	LS-7	9/8/2015	--	--	--	1.26F	--	--
	LS-7-A2	9/8/2015	--	--	--	--	--	--
Old Fredericksburg Road	OFR-3	9/8/2015	--	--	--	6.88	3.64	--
	OFR-3-A2	9/8/2015	--	--	--	--	--	--
Ralph Fair Road	RFR-10	9/8/2015	--	--	--	19.71	7.93	--
	RFR-10-A2	9/8/2015	--	--	--	--	--	--
	RFR-10-B2	9/8/2015	--	--	--	--	--	--
	RFR-11	9/8/2015	--	--	--	0.84F	1.71	--
	RFR-11 FD	9/8/2015	--	--	--	0.71F	1.58	--
	RFR-11-A2	9/8/2015	--	--	--	--	--	--
Scenic Loop Drive	SLD-01	9/14/2015	--	--	--	--	--	--
Laboratory Detection Limits & Maximum Contaminant Level								
Method Detection Limit (MDL)			0.12	0.07	0.08	0.06	0.05	0.08
Reporting Limit (RL)			1.2	1.2	0.6	1.4	1	1.1
Max. Contaminant Level (MCL)			7	70	100	5	5	2

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
VOC data reported in ug/L.
Abbreviations/Notes:
FD Field Duplicate
TCE Trichloroethene
PCE Tetrachloroethene
DCE Dichloroethene
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.

3.0 SUMMARY AND RECOMMENDATIONS

Results of the September 2015 sampling event are summarized as follows:

- All 7 wells scheduled for collection in September 2015 were obtained during the quarterly monitoring event. Also, 7 GAC filtered samples were collected.
- Wells RFR-10 and OFR-3 exceeded the MCL in September 2015 for PCE, and RFR-10 also exceeded the MCL for TCE. These wells are equipped with GAC filtration systems.
- PCE and/or TCE were detected above the Reporting Limits (RLs) in private drinking water wells LS-5, LS-6, RFR-11 and the RFR-11 field duplicate. These three wells have GAC filtration systems in place.
- 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, and vinyl chloride were not detected in any of the off-post wells sampled in September 2015.
- GAC-filtered samples were collected as part of the quarterly groundwater monitoring in September 2015. All GAC-filtered samples were non-detect indicating the GAC systems are functioning properly. The next GAC-filtered samples will be collected in March 2016.
- Semi-annual GAC maintenance, including carbon change-out, was performed August 26, 2015. The next semi-annual GAC maintenance will be due in February 2016.
- In accordance with project DQOs, the rationale for the selection of 56 wells to be collected in December 2015 is provided in **Table 3.1**.

APPENDIX A
EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT

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 HSP.	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 (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2010).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a 3 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 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 (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2010). 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 (§3.2.3) and install as needed (§3.2.5 both of the DQOs for the Groundwater Contamination Investigation, revised November 2010).	Perform maintenance as needed. Install new GACs as needed.	Yes	Maintenance to 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
SEPTEMBER 2015 QUARTERLY OFF-POST
GROUNDWATER ANALYTICAL RESULTS

Appendix B
September 2015 Quarterly Off-post Groundwater Analytical Results

Well ID	Sample Date	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride
LS-5	9/8/2015	0.12U	0.07U	0.08U	0.83F	2.43	0.08U
LS-5-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-6	9/8/2015	0.12U	0.07U	0.08U	0.62F	2.04	0.08U
LS-6-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-7	9/8/2015	0.12U	0.07U	0.08U	1.26F	0.05U	0.08U
LS-7-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OFR-3	9/8/2015	0.12U	0.07U	0.08U	6.88	3.64	0.08U
OFR-3-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10	9/8/2015	0.12U	0.07U	0.08U	19.71	7.93	0.08U
RFR-10-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10-B2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-11	9/8/2015	0.12U	0.07U	0.08U	0.84F	1.71	0.08U
RFR-11 FD	9/8/2015	0.12U	0.07U	0.08U	0.71F	1.58	0.08U
RFR-11-A2	9/8/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
SLD-01	9/14/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

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

Abbreviations/Notes:

FD Field Duplicate
TCE Trichloroethene
PCE Tetrachloroethene
DCE Dichloroethene

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 77294
SDG 77325**

DATA VERIFICATION SUMMARY REPORT
for off-post samples collected from
CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers groundwater samples and the associated field quality control (QC) samples collected from off-post Camp Stanley Storage Activity (CSSA) on 8th of September 2015. The samples were assigned to the following Sample Delivery Group (SDG). All off-post groundwater samples were analyzed for VOCs only.

77294

The field QC samples associated with this SDG was a trip blank (TB), and one set of parent and field duplicate (FD) samples. 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. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 2.0°C, which was within the 2-6°C range recommended by the CSSA QAPP.

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 fifteen (15) water samples, including thirteen (13) off-post groundwater samples, one (1) FD, and one (1) TB. All samples were collected on 8th of September 2015 and analyzed for a reduced list of VOCs which included: 1,1-dichloroethene, *cis*-1,2-dichloroethene, tetrachloroethene, *trans*-1,2-dichloroethene, trichloroethene, and vinyl chloride.

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The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in two analytical batches (#200364 and 200393) under one set of 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 two laboratory control spike (LCS) samples and the surrogate spikes.

All LCSs and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was measured based on the relative percent difference (%RPD) of the parent and FD sample results. Sample RFR-11 was collected in duplicate.

TCE was detected in both parent and FD samples, the %RPD was 7.9% which was within the acceptance 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 trip and laboratory blanks for cross contamination of samples during transit or 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.
- The two LCSs were prepared using a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

There were two method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect for all target VOCs at method detection limits.

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%.

DATA VERIFICATION SUMMARY REPORT
for on- and off-post samples collected from
CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers groundwater samples and the associated field quality control (QC) sample collected from on-post and off-post Camp Stanley Storage Activity (CSSA) from September 11 to 14, 2015. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs) and all on-post drinking water samples were also analyzed for metals including arsenic, barium, cadmium, chromium, copper, lead, zinc, and mercury. The one monitoring well sample was analyzed for cadmium, chromium, and lead only.

77325

The field QC samples associated with this SDG were one set of parent/field duplicate (FD) and one trip blank (TB). TB was analyzed for VOC only. 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. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 3.0 °C, which was within the 2-6°C range recommended by the CSSA QAPP.

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 five (5) samples, including two (2) on-post groundwater samples, one (1) off-post groundwater samples, one (1) FD, and one (1) TB. All samples were collected from September 11 to 14, 2015 and analyzed for a reduced list of VOCs which included: 1,1-dichloroethene, *cis*-1,2-dichloroethene, tetrachloroethene, *trans*-1,2-dichloroethene, trichloroethene, and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in analytical batch #200498 under one set of 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 spike (LCS) sample and the surrogate spikes.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated based on the relative percent difference (%RPD) of parent/FD results. Sample CS-13 was collected in duplicate.

None of the target compounds were detected at or above the reporting limit in the parent/FD samples.

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 trip and laboratory blanks for cross contamination of samples during transit or 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 for both sets of curves.

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

There were one method blank and one TB associated with the VOC analyses in this SDG. Both blanks were 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 three (3) groundwater samples including one (1) on-post drinking water well sample, one FD, and one monitor well sample. All samples were collected from September 11 to 14, 2015 and analyzed for cadmium, chromium, and lead. The two drinking water samples were also analyzed for arsenic, barium, copper, and zinc.

The ICP-AES metals analyses were performed using USEPA SW846 Method 6010B. These on-post well 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 #200731. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

All LCS recoveries were within acceptance criteria.

Precision

Precision was measured based on the %RPD of parent/FD sample results. Sample CS-13 was collected in duplicate.

Only barium and zinc were detected above the reporting limits in both parent and FD samples. The %RPD was 0.7% for barium and 4.2% which met the 20%RPD requirement. No flags were applied.

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.
- No dilution test was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP-AES analyses in this SDG. All blanks were 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 three (3) groundwater samples including one (1) on-post drinking water well sample, one FD, and one monitor well sample. All samples were collected from September 11 to 14, 2015 and analyzed for mercury.

The mercury analyses were performed using USEPA SW846 Method 7470A. These on-post well samples were 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 #200907. The analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery was within acceptance criteria.

Precision

Precision was measured based on the %RPD of parent/FD sample results. Sample CS-13 was collected in duplicate.

Mercury was not detected in the parent and FD samples.

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 calibration verification 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 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 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 90%.