

**March 2015**

**Off-Post**

**Quarterly Groundwater Monitoring Report**



*Prepared For*

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

**September 2015**

## EXECUTIVE SUMMARY

- Fifty-two of 54 wells and all 7 point-of-use treatment samples scheduled for collection in March 2015 were obtained during the quarterly monitoring event. Two wells were not sampled due to electricity being shut off (RFR-13) and field crew's inability to get the well pump to engage (RFR-4). This event is considered a "snapshot" event, when all on- and off-post wells are sampled on a 9-month basis to provide a complete regional assessment of the aquifer condition.
- Analyses indicated off-post wells RFR-10 and OFR-3 exceeded the maximum contaminant level (MCL) for tetrachloroethene (PCE) and/or trichloroethene (TCE). TCE was also detected above the laboratory reporting limit (RL) in well OFR-3. These wells are equipped with granular activated carbon (GAC) filtration systems.
- GAC-filtered samples were collected in March 2015. All GAC-filtered sample results were non-detect indicating the GAC units are functioning properly. The next GAC-filtered samples will be collected in September 2015.
- Semi-annual GAC maintenance was performed February 26, 2015. This involved replacing the first carbon canister in each GAC unit and other routine maintenance. This carbon exchange is performed semi-annually; the next carbon change-out will be due in August 2015.
- The electricity at well OFR-3 has been restored and the well is operational. The well and GAC system were flushed and samples were collected before the GAC system and after the GAC system on April 3, 2015. The GAC filtered sample reported no detections indicating the GAC system is functioning properly. This well will be returned to the quarterly sampling schedule in accordance with the project DQOs.
- The DQOs and the long term monitoring optimization (LTMO) are currently under review and will be submitted to the Texas Commission on Environmental Quality (TCEQ) and US Environmental Protection Agency (USEPA) for approval.

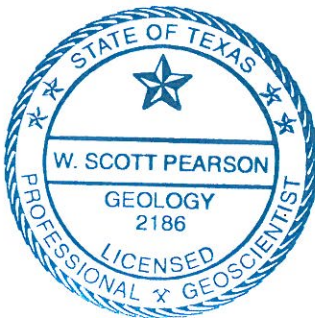
## GEOSCIENTIST CERTIFICATION


### March 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 March 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 March 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  
  
9-15-2015  
\_\_\_\_\_  
Date

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## ABBREVIATIONS AND ACRONYMS

µg/L	microgram per liter
1,1-DCE	1,1-dichloroethene
APPL	Agriculture and Priority Pollutants Laboratories, Inc.
BSR	Boerne Stage Road
<i>cis</i> -1,2-DCE	<i>cis</i> -1,2-Dichloroethene
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objective
FD	Field Duplicate
FO	Fair Oaks
GAC	Granular Activated Carbon
HS	Hidden Springs
HSP	Health and Safety Plan
I10	Interstate Highway 10
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
OW	The Oaks Water Supply Corporation
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

## MARCH 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 March 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 March 2<sup>nd</sup> through April 3<sup>rd</sup>, 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 US 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 MARCH 2015 ANALYTICAL RESULTS

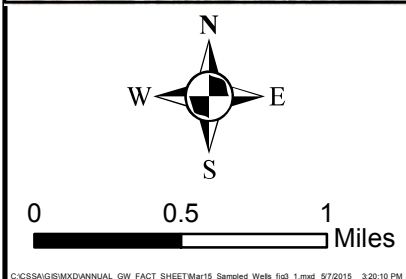
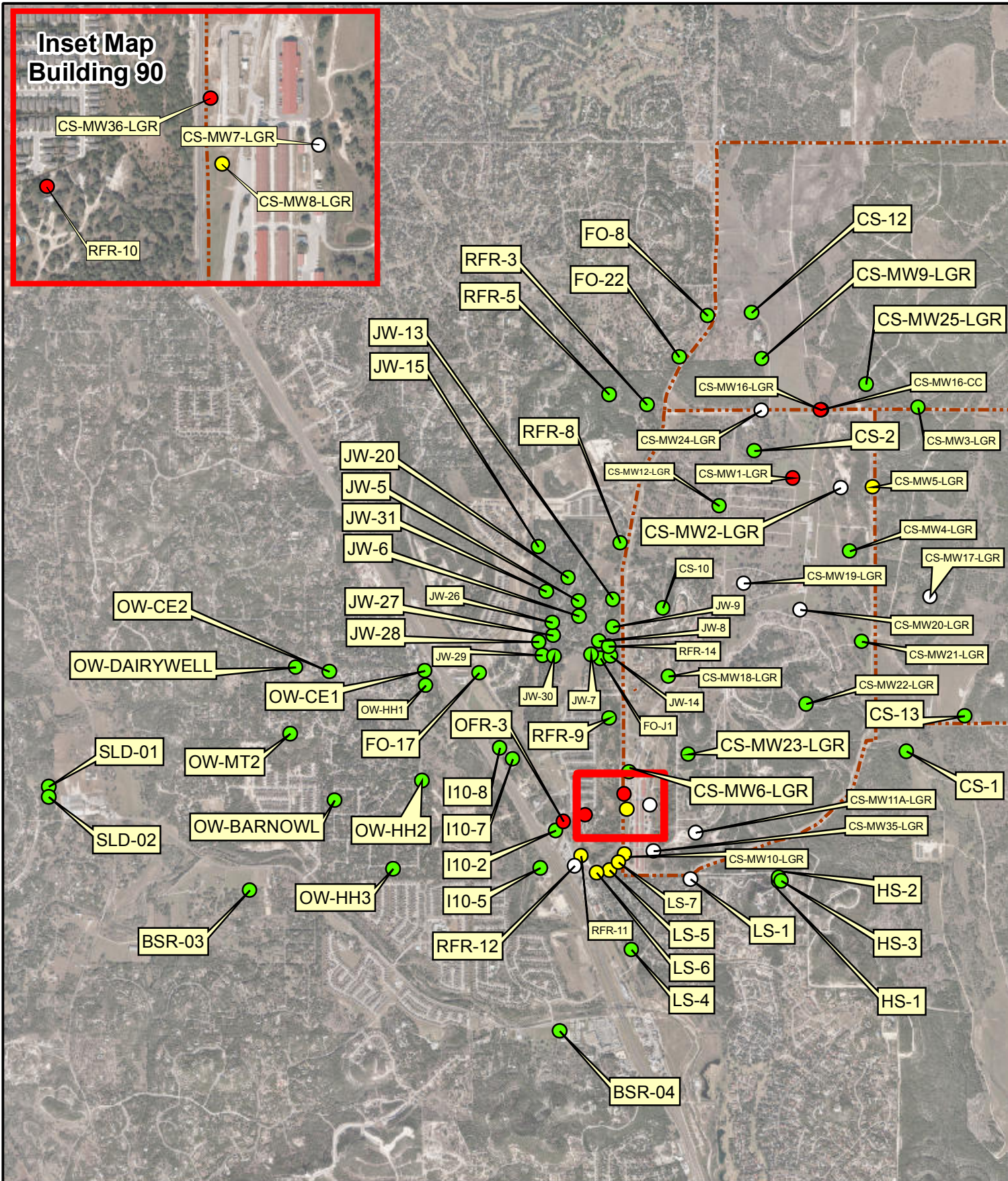
During the March 2015 event, groundwater samples were collected from 52 off-post wells shown in **Figure 2.1**. Two wells (RFR-4 & RFR-13) were not sampled this event. Seven granular activated carbon (GAC) filtered samples (LS-5-A2, LS-6-A2, LS-7-A2, OFR-3-A2, RFR-10-A2, RFR-10-B2, and RFR-11-A2) are collected semi-annually and were also collected this event. In conjunction with the on-post monitoring initiative (under a separate report), the March 2015 groundwater sampling constituted a “snapshot” event in which all wells are sampled on a 9-month basis to provide a regional assessment of the aquifer. The results of the snapshot events are assessed annually in the forthcoming December 2015 groundwater monitoring report.

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

- One privately owned well along Boerne Stage Road (BSR-03) and one public supply well (BSR-04).
- Four public supply wells in the Fair Oaks (FO) area (FO-8, FO-17, FO-J1 & FO-22).
- Three public wells in the Hidden Springs (HS) Estates subdivision (HS-1, HS-2 & HS-3).
- Four wells used by the general public in the Interstate Highway 10 (I10) area (I10-2, I10-5, I10-7 & I10-8).
- Fifteen privately-owned wells in the Jackson Woods (JW) subdivision (JW-5, JW-6, JW-7, JW-8, JW-9, JW-13, JW-14, JW-15, JW-20, JW-26, JW-27, JW-28, JW-29, JW-30, and JW-31).
- Five wells in the Leon Springs (LS) Villa area (two public supply wells removed from service: LS-1, and LS-4; and three privately-owned wells: LS-5, LS-6, and LS-7).
- One privately-owned well on Old Fredericksburg Road (OFR) (OFR-3).
- Eight privately-owned wells in the Ralph Fair Road (RFR) area (RFR-3, RFR-5, RFR-8, RFR-9, RFR-10, RFR-11, RFR-12, and RFR-14);
- Eight public supply wells from The Oaks Water Supply System (OW) (OW-HH1, OW-HH2, OW-HH3, OW-CE1, OW-CE2, OW-MT2, OW-BARNOWL, OW-DAIRYWELL);
- Two public supply wells in the Scenic Loop Drive (SLD) area, SLD-01 and SLD-02.

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.





- Sampled Wells March 2015**
- > MCL (VOC's) only
  - > RL (VOC's) only
  - > MDL (VOC's) only
  - ND
  - Fence Line

**Figure 2.1**  
**On-Post and Off-Post Well Sampling Locations for March 2015**  
**Camp Stanley Storage Activity**

**PARSONS**





A total of 59 groundwater samples, five trip blanks, six field duplicate (FD), and three 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-#15, #18, #20, #22, #23, and #28) 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 March 19<sup>th</sup> through April 16<sup>th</sup>, 2015.

Concentrations of the VOCs detected in March 2015 are presented in **Table 2.2**. Full analytical results from the March 2015 sampling event are presented in **Appendix B**. As shown in **Table 2.1**, 59 of 61 samples that were scheduled for collection in March 2015 were obtained. Well RFR-13 was not sampled because the home is vacant and electricity is off. Well RFR-4 was not sampled due to field crew's inability to get the well pump to engage.

In February 2015, routine semi-annual maintenance was performed on the GAC treatment systems at LS-5, LS-6, LS-7, RFR-10, and RFR-11. Carbon canisters were exchanged and other routine maintenance was performed. GAC-filtered samples were collected this quarter and will be collected again during the September 2015 event. Maintenance was not performed on the OFR-3 GAC system in February due to no electricity at the property. On March 30, 2015 the new OFR-3 property owner contacted CSSA. As such, groundwater samples were collected in April from this well, and are included as part of this report.

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**  
**March 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
Boerne Stage Road	BSR-03	3/3/2015	--	--	--	--	--	--
	BSR-04	3/2/2015	--	--	--	--	--	--
Fair Oaks	FO-8	3/4/2015	--	--	--	--	--	--
	FO-8 FD	3/4/2015	--	--	--	--	--	--
	FO-17	3/4/2015	--	--	--	--	--	--
	FO-22	3/4/2015	--	--	--	--	--	--
	FO-J1	3/5/2015	--	--	--	--	--	--
Hidden Springs	HS-1	3/11/2015	--	--	--	--	--	--
	HS-2	3/11/2015	--	--	--	--	--	--
	HS-3	3/11/2015	--	--	--	--	--	--
IH-10	I10-2	3/2/2015	--	--	--	--	--	--
	I10-5	3/3/2015	--	--	--	--	--	--
	I10-7	3/2/2015	--	--	--	--	--	--
	I10-8	3/3/2015	--	--	--	--	--	--
Jackson Woods Subdivision	JW-5	3/3/2015	--	--	--	--	--	--
	JW-6	3/3/2015	--	--	--	--	--	--
	JW-7	3/3/2015	--	--	--	--	--	--
	JW-8	3/3/2015	--	--	--	--	--	--
	JW-9	3/18/2015	--	--	--	--	--	--
	JW-9 FD	3/18/2015	--	--	--	--	--	--
	JW-13	3/20/2015	--	--	--	--	--	--
	JW-14	3/5/2015	--	--	--	--	--	--
	JW-15	3/5/2015	--	--	--	--	--	--
	JW-20	3/5/2015	--	--	--	--	--	--
	JW-26	3/3/2015	--	--	--	--	--	--
	JW-27	3/4/2015	--	--	--	--	--	--
	JW-27 FD	3/4/2015	--	--	--	--	--	--
	JW-28	3/6/2015	--	--	--	--	--	--
	JW-29	3/3/2015	--	--	--	--	--	--
JW-29 FD	3/3/2015	--	--	--	--	--	--	
JW-30	3/5/2015	--	--	--	--	--	--	
JW-31	3/18/2015	--	--	--	--	--	--	
Leon Springs Villas	LS-1	3/11/2015	--	--	--	0.49F	--	--
	LS-4	3/11/2015	--	--	--	--	--	--
	LS-5	3/2/2015	--	--	--	0.98F	3.36	--
	LS-5-A2	3/2/2015	--	--	--	--	--	--
	LS-6	3/2/2015	--	--	--	0.81F	3.48	--
	LS-6-A2	3/2/2015	--	--	--	--	--	--
	LS-7	3/2/2015	--	--	--	1.92	0.44F	--
LS-7-A2	3/2/2015	--	--	--	--	--	--	
Old Fredericksburg Road	OFR-3	4/3/2015	--	--	--	6.25	3.3	--
	OFR-3-A2	4/3/2015	--	--	--	--	--	--
The Oaks Water Supply	OW-BARNOWL	3/4/2015	--	--	--	--	--	--
	OW-CE1	3/4/2015	--	--	--	--	--	--
	OW-CE2	3/4/2015	--	--	--	--	--	--
	OW-DAIRYWELL	3/4/2015	--	--	--	--	--	--
	OW-HH1	3/4/2015	--	--	--	--	--	--
	OW-HH2	3/4/2015	--	--	--	--	--	--
	OW-HH2 FD	3/4/2015	--	--	--	--	--	--
	OW-HH3	3/4/2015	--	--	--	--	--	--
OW-MT2	3/4/2015	--	--	--	--	--	--	

**Table 2.2 (cont.)  
March 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
Ralph Fair Road	RFR-3	3/3/2015	--	--	--	--	--	--
	RFR-5	3/3/2015	--	--	--	--	--	--
	RFR-8	3/4/2015	--	--	--	--	--	--
	RFR-9	3/6/2015	--	--	--	--	--	--
	RFR-10	3/2/2015	--	<b>0.35F</b>	--	<b>21.58</b>	<b>14.42</b>	--
	RFR-10-A2	3/2/2015	--	--	--	--	--	--
	RFR-10-B2	3/2/2015	--	--	--	--	--	--
	RFR-11	3/2/2015	--	--	--	<b>0.77F</b>	<b>2.61</b>	--
	RFR-11-A2	3/2/2015	--	--	--	--	--	--
	RFR-12	3/2/2015	--	--	--	<b>0.24F</b>	<b>0.89F</b>	--
	RFR-12 FD	3/2/2015	--	--	--	<b>0.26F</b>	<b>0.82F</b>	--
RFR-14	3/4/2015	--	--	--	--	--	--	
Scenic Loop Drive	SLD-01	3/3/2015	--	--	--	--	--	--
	SLD-02	3/3/2015	--	--	--	--	--	--
<b>Laboratory Detection Limits &amp; Maximum Contaminant Level</b>								
<b>Method Detection Limit (MDL)</b>			<b>0.12</b>	<b>0.07</b>	<b>0.08</b>	<b>0.06</b>	<b>0.05</b>	<b>0.08</b>
<b>Reporting Limit (RL)</b>			<b>1.2</b>	<b>1.2</b>	<b>0.6</b>	<b>1.4</b>	<b>1</b>	<b>1.1</b>
<b>Max. Contaminant Level (MCL)</b>			<b>7</b>	<b>70</b>	<b>100</b>	<b>5</b>	<b>5</b>	<b>2</b>

<b>BOLD</b>	≥ MDL
<b>BOLD</b>	≥ RL
<b>BOLD</b>	≥ 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 March 2015 sampling event are summarized as follows:

- Fifty-two of 54 wells and all 7 post-GAC samples scheduled for collection in March 2015 were obtained during the quarterly monitoring event. Two wells were not sampled due to electricity being shut off (RFR-13) and field crew's inability to get the well pump to engage (RFR-4).
- Wells OFR-3 and RFR-10 exceeded the MCL in March 2015 for PCE and/or TCE. These wells are equipped with a GAC filtration system.
- PCE and/or TCE were detected above the RLs in public and/or private drinking water wells LS-5, LS-6, LS-7, and RFR-11. These four wells have GAC treatment systems in place.
- 1,1-DCE, *trans*-1,2-DCE, and vinyl chloride were not detected in any of the off-post wells in March 2015.
- GAC-filtered samples were collected as part of the quarterly groundwater monitoring. All GAC-filtered samples were non-detect indicating the GAC units are functioning properly. The next GAC-filtered samples will be collected in September 2015.
- Semi-annual GAC maintenance, including carbon change-out, was performed February 26, 2015. The next semi-annual GAC maintenance will be due in August 2015.
- The property with well OFR-3 was sold again in December 2014. The new owner has returned the access agreement and turned the electricity back on. After a few wellhead plumbing repairs, well OFR-3 is operational. The well and GAC unit were flushed and pre and post-GAC samples were collected April 3, 2015. The post-GAC sample is non-detect indicating the GAC unit is functioning properly. This well will be returned to the quarterly sampling schedule in accordance with the DQOs.
- In accordance with project DQOs, the rationale for the selection of 7 wells to be collected in June 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
	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.	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.	Yes	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.
Project Schedule/ Reporting	The quarterly monitoring project schedule shall provide a schedule for sampling, analysis, validation, verification, reviews, and reports for monitoring events off-post.	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.	Yes	Continue quarterly reporting to include a schedule for sampling, analysis, validation, and verification and data review and data reports.

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**  
**MARCH 2015 QUARTERLY OFF-POST**  
**GROUNDWATER ANALYTICAL RESULTS**

**Appendix B**  
**March 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
BSR-03	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
BSR-04	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
FO-8	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
FO-8 FD	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
FO-17	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
FO-22	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
FO-J1	3/5/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
HS-1	3/11/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
HS-2	3/11/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
HS-3	3/11/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
I10-2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
I10-5	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
I10-7	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
I10-8	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-5	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-6	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-7	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-8	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-9	3/18/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-9 FD	3/18/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-13	3/20/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-14	3/5/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-15	3/5/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-20	3/5/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-26	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-27	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-27 FD	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-28	3/6/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-29	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-29 FD	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-30	3/5/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
JW-31	3/18/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-1	3/11/2015	0.12U	0.07U	0.08U	<b>0.49F</b>	0.05U	0.08U
LS-4	3/11/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-5	3/2/2015	0.12U	0.07U	0.08U	<b>0.98F</b>	<b>3.36</b>	0.08U
LS-5-A2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-6	3/2/2015	0.12U	0.07U	0.08U	<b>0.81F</b>	<b>3.48</b>	0.08U
LS-6-A2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-7	3/2/2015	0.12U	0.07U	0.08U	<b>1.92</b>	<b>0.44F</b>	0.08U
LS-7-A2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OFR-3	4/3/2015	0.12U	0.07U	0.08U	<b>6.25</b>	<b>3.3</b>	0.08U
OFR-3-A2	4/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-BARNOWL	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-CE1	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-CE2	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-DAIRYWELL	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-HH1	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-HH2	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-HH2 FD	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-HH3	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-MT2	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U

**Appendix B (cont.)**  
**March 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
RFR-3	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-5	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-8	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-9	3/6/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10	3/2/2015	0.12U	<b>0.35F</b>	0.08U	<b>21.58</b>	<b>14.42</b>	0.08U
RFR-10-A2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10-B2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-11	3/2/2015	0.12U	0.07U	0.08U	<b>0.77F</b>	<b>2.61</b>	0.08U
RFR-11-A2	3/2/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-12	3/2/2015	0.12U	0.07U	0.08U	<b>0.24F</b>	<b>0.89F</b>	0.08U
RFR-12 FD	3/2/2015	0.12U	0.07U	0.08U	<b>0.26F</b>	<b>0.82F</b>	0.08U
RFR-14	3/4/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
SLD-01	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
SLD-02	3/3/2015	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U

<b>BOLD</b>	≥ MDL
<b>BOLD</b>	≥ RL
<b>BOLD</b>	≥ 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 75724**

**SDG 75760**

**SDG 75791**

**SDG 75902**

**SDG 75926**

**SDG 76049**

**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 2<sup>nd</sup> and 3<sup>rd</sup> of March 2015. The samples were assigned to the following Sample Delivery Group (SDG). All off-post groundwater samples were analyzed for VOCs only.

75724

The field QC samples associated with this SDG were two sets of parent/field duplicate (FD), one set of matrix spike/matrix spike duplicate (MS/MSD), and a trip blank (TB). 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 thirty-three (33) groundwater samples, including twenty-six (26) off-post groundwater samples, two (2) FD, one (1) set of MS/MSD, and one (1) TB. All samples were collected on 2<sup>nd</sup> and 3<sup>rd</sup> of March 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 three analytical batches (#194705, #194774, and #194775) 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 three laboratory control spike (LCS) samples, MS/MSD, and the surrogate spikes. Sample JW-7 was designated as the parent sample for the MS/MSD analyses on the COC.

All LCSs, MS/MSD, and surrogate spike recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated based on the relative percent difference (%RPD) of parent/FD results. Samples RFR-12 and JW-29 were collected in duplicate.

For both sets of parent and FD samples, all results were non-detect at or above the reporting; therefore, the %RPD calculation was not applicable.

### **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.
- All three 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 three method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect for all target VOCs. No target VOC was detected at or above the associated MDL in the three method blanks.

### **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 March 4 to 9, 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 groundwater samples were also analyzed for metals including arsenic, barium, cadmium, chromium, lead, zinc, and mercury.

75760

The field QC samples associated with this SDG were one set of matrix spike/matrix spike duplicate (MS/MSD), four sets 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 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 thirty-two (32) samples, including four (4) on-post groundwater samples, twenty-one (21) off-post groundwater samples, four (4) FDs, one pair of MS/MSD, and one (1) TB. All samples were collected from March 4 to 9, 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 four analytical batches (#194967, #194961, #194968, and #194917) under two sets of initial calibration (ICAL), one for each instrument. 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 four laboratory control spike (LCS) samples and the surrogate spikes. MS/MSD analyses were performed with sample CS-12.

All LCSs, MS, MSD, and surrogate spike recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated based on the relative percent difference (%RPD) of MS/MSD and four sets of parent/FD. Samples OW-HH2, FO-8, JW-27, and CS-1 were collected in duplicate.

%RPDs of the MS/MSD results were compliant.

None of the target compounds were detected at or above the reporting limit for all four sets of parent/FD.

### **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.
- All four LCSs were 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 four method blanks and one TB associated with the VOC analyses in this SDG. All five blanks were non-detect for all target VOCs. No target VOC was detected at or above the associated MDL in the blanks.

### **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 seven (7) groundwater samples including four (4) on-post drinking water well samples, one FD, and one pair of MS/MSD. All samples were collected on March 9, 2015 and analyzed for arsenic, barium, cadmium, chromium, copper, lead 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 #195354. All analyses were performed undiluted.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS, MS, and MSD. Sample CS-12 was designated for MS/MSD analyses.

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

### **Precision**

Precision was measured based on the %RPD of MS/MSD results and parent/FD sample results. Sample CS-1 was collected in duplicate.

All %RPDs of MS/MSD results were compliant.

Only barium and zinc were detected above the reporting limits in both parent and FD samples. The %RPD was 3.7% for barium and 12% 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 seven (7) groundwater samples including four (4) on-post drinking water well samples, one FD, and one pair of MS/MSD. All samples were collected on March 9, 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 #195343. The analyses were performed undiluted.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS, MS and MSD samples. Sample CS-12 was designated as the parent sample for the MS/MSD analyses.

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

### **Precision**

Precision was measured based on the %RPD of MS/MSD and parent/FD sample results. Sample CS-1 was collected in duplicate.

The %RPD of the MS/MSD was compliant.

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%.

**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) on March 10 and 11, 2015. The samples were assigned to the following Sample Delivery Group (SDG). All off-post samples were analyzed for volatile organic compounds (VOCs) and all on-post samples were analyzed for VOCs and metals including cadmium, chromium, lead, and mercury.

75791

The field QC samples associated with this SDG were one set of matrix spike/matrix spike duplicate (MS/MSD) and two trip blanks (TBs). TBs were 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 two coolers. The coolers were received by the laboratory at a temperature of 3.0 °C and 3.5°C, which were both 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 nineteen (19) samples, including ten (10) on-post groundwater samples, five (5) on-post groundwater samples, one pair of MS/MSD, and two (2) TBs. All samples were collected on March 10 and 11, 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 one batch (#194942) 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. MS/MSD analyses were performed with sample HS-2.

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

### **Precision**

Precision was evaluated based on the relative percent difference (%RPD) of MS/MSD.

%RPDs of the MS/MSD results were compliant.

### **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. 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 two TBs associated with the VOC analyses in this SDG. All three blanks were non-detect for all target VOCs. No target VOC was detected at or above the associated MDL in the blanks.

### **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 ten (10) on-post groundwater samples which were collected on March 10 and 11, 2015 and analyzed for cadmium, chromium, and lead.

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 #195356. 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 could not be measured due to the lack of duplicate analysis in this batch.

### **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 ten (10) on-post groundwater samples collected on March 10 and 11, 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 #195343. 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 could not be measured due to the lack of duplicate analysis in this analytical batch.

**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%.

**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) on March 17 and 18, 2015. The samples were assigned to the following Sample Delivery Group (SDG). All off-post samples were analyzed for volatile organic compounds (VOCs) and all on-post samples were analyzed for VOCs and metals including cadmium, chromium, lead, and mercury.

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The field QC samples associated with this SDG were one set of matrix spike/matrix spike duplicate (MS/MSD), two pairs of parent/field duplicate (FD) samples, 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 2.5°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 fourteen (14) samples, including seven (7) on-post groundwater samples, one (1) off-post groundwater sample, one pair of MS/MSD, two (2) FDs, and one (1) TB. All samples were collected on March 17 and 18, 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 one batch (#195563) 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, MS/MSD, and the surrogate spikes. MS/MSD analyses were performed with sample CS-MW17-LGR.

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

### **Precision**

Precision was evaluated based on the relative percent difference (%RPD) of MS/MSD and parent/FD sample results. Samples JW-9 and CS-MW17-LGR were collected in duplicate.

%RPDs of the MS/MSD results were compliant.

None of the target VOCs were detected at or above the reporting limit in both sets of parent/FD samples. %RPD calculations were not applicable.

### **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. 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. No target VOC was detected at or above the associated MDL in the blanks.

### **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 ten (10) on-post groundwater samples which were collected on March 17 and 18, 2015 and analyzed for cadmium, chromium, and lead.

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 #195532. All analyses were performed undiluted.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS, MS and MSD. Sample CS-MW17-LGR was designated as the parent sample for the MS/MSD analyses.

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

### **Precision**

Precision was evaluated based on the %RPD of MS/MSD and parent/FD results.

All %RPDs of MS/MSD were compliant. None of the three target metals were detected at or above the reporting limit.

### **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 ten (10) on-post groundwater samples collected on March 17 and 18, 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 #195523. The analyses were performed undiluted.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS, MS and MSD. Sample CS-MW17-LGR was designated as the parent sample for the MS/MSD analyses.

The LCS recovery was within acceptance criteria.

%R of the MS was 115% and MSD was 125% with control limits of 77-120%. Parent sample result was flagged with "M" according to the CSSA QAPP.

### **Precision**

Precision was evaluated based on the %RPD of MS/MSD and parent/FD sample results. Sample CS-MW17-LGR was collected in duplicate.

%RPD of MS/MSD results was compliant.

Mercury was not detected in the parent or FD samples; therefore, the %RPD calculation was not applicable.

### **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%.

**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 one groundwater sample and one associated field quality control (QC) samples collected from off-post Camp Stanley Storage Activity (CSSA) on 20th of March 2015. The samples were assigned to the following Sample Delivery Group (SDG). Both samples were analyzed for VOCs only.

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The field QC sample associated with this SDG was a trip blank (TB). 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.

Both 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 two (2) water samples, including one (1) off-post groundwater sample and one (1) TB. Both samples were collected on 20th of March 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 #195529 under one set of initial calibration (ICAL). Both 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 could not be measured due to the lack of duplicate analyses in this SDG..

### **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.

Both samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. Both 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 LCS was 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 one method blank and one TB associated with the VOC analyses in this SDG. Both blanks were non-detect for all target VOCs. No target VOC was detected at or above the associated MDL in the method blank.

### **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 two 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 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 two groundwater samples and the associated field quality control (QC) sample collected from off-post Camp Stanley Storage Activity (CSSA) on 4th of April 2015. The samples were assigned to the following Sample Delivery Group (SDG). Both off-post groundwater samples were analyzed for VOCs only.

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The field QC sample associated with this SDG was a trip blank (TB). 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 2.5°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 three (3) groundwater samples, including two (2) off-post groundwater samples and one (1) TB. All samples were collected on 4th of April 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 one analytical batch (#195819) 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 could not be evaluated due to the lack of duplicate analysis in this SDG.

### **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 blank 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 LCS was 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 one method blank and one TB associated with the VOC analyses in this SDG. Both blanks were non-detect at MDL level 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%.