

**FINAL**

**March 2010**

**Off-Post**

**Quarterly Groundwater Monitoring Report**



*Prepared For*

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

**June 2010**

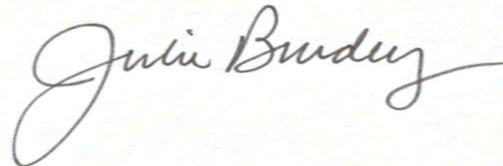
## GEOSCIENTIST CERTIFICATION

### March 2010 Off-post Quarterly Groundwater Monitoring Report

For

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

I, Julie Burdey, P.G., hereby certify that the March 2010 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 CSSA Environmental Office, laboratory data provided by APPL, and field data obtained during groundwater monitoring conducted at the site in March 2010, and is true and accurate to the best of my knowledge and belief.



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Julie Burdey, P.G.  
State of Texas  
Geology License No. 1913

6/21/2010  
Date

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## EXECUTIVE SUMMARY

- A total of 33 off-post wells and 6 GAC filtered samples were collected during the March 2010 monitoring event. All wells scheduled to be sampled were sampled.
- Analyses indicated off-post well RFR-10 exceeded the maximum contaminant level (MCL) for tetrachloroethene (PCE) and trichloroethene (TCE). Well RFR-10 is equipped with a granular activated carbon (GAC) treatment system.
- Wells I10-2 and RFR-12 had their first PCE/TCE detections since March 2005. Sampling of these wells first began September 2001 and August 2001, respectively.
- GAC filtered samples collected in March 2010 were all non-detect indicating that the GAC filtration systems are functioning properly. GAC filtered samples will be collected again during the September 2010 event.
- Semi-annual GAC maintenance was performed in January 2010. This involved replacing the lead carbon canister in each GAC unit and other routine maintenance. This carbon exchange is performed semi annually; the next visit is due in July 2010.

## MARCH 2010 OFF-POST GROUNDWATER MONITORING REPORT CAMP STANLEY STORAGE ACTIVITY

### 1.0 INTRODUCTION

This report presents results from the off-post quarterly sampling performed at Camp Stanley Storage Activity (CSSA) in March 2010 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 2009 quarterly monitoring events (March, June, September, and December) will be described in detail in an Annual Report to be submitted after December 2010. 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 scoped under the U.S. Army Corps of Engineers (USACE) Fort Worth District (CESWF), Contract W9126G-07-D-0028, Task Order DO50, was performed March 1 through 5, 2010. 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 located in the Plan.

The CSSA groundwater monitoring program also follows the provisions of the groundwater monitoring program DQOs as well as the recommendations of all applicable project-specific work plans. **Appendix A** provides an evaluation of the Data Quality Objective Attainment for this sampling event.

Current objectives of the off-post groundwater monitoring program include determining 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 2010 ANALYTICAL RESULTS

In March 2010, a groundwater sample was collected from each of 33 off-post wells in addition to 6 GAC filtered samples shown in **Figure 2-1**. GAC (granular activated carbon) filtered samples (LS-6-A2, LS-7-A2, RFR-10-A2, RFR-10-B2, RFR-11-A2, and OFR-3-A2) are collected semi-annually and will be sampled again during the September 2010 monitoring event. **Table 2-1** includes the rationale for selection of the wells sampled in March 2010, and **Figure 2-1** provides well locations for the following sampled wells:

- Three public supply wells in the Fair Oaks area (FO-J1, FO-8 and FO-22);
- One public supply well in the Hidden Springs Estates subdivision (HS-2);
- Four public wells (I10-2, I10-5, I10-7 and I10-8) and one privately owned unused well (I10-4), in the Interstate-10 area;
- Eleven privately owned wells in the Jackson Woods subdivision (JW-5, JW-7, JW-8,

- JW-9, JW-14, JW-15, JW-27, JW-28, JW-29, JW-30 and JW-31);
- Five wells in the Leon Springs Villa area (one public well: LS-6; two privately-owned wells: LS-5 and LS-7; and two wells: LS-1 and LS-4 that were taken out of service but will remain in the sampling program for data collection purposes);
  - Three privately owned wells on Old Fredericksburg Road (OFR-1, OFR-3 and OFR-4); and
  - Five privately owned wells in the Ralph Fair Road area (RFR-9, RFR-10, RFR-11, RFR-12 and RFR-14).

All wells 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 39 groundwater samples (33 wells and 6 GAC filtered samples), four field duplicate samples, two matrix spike/matrix spike duplicate (MS/MSD) pairs, and three trip blanks were submitted to Agriculture & Priority Pollutant Laboratory (APPL) in Fresno, 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, tetrachlorethene (PCE), trichloroethene (TCE), and vinyl chloride.

The data packages (Parsons internal reference BRAC50-#10, #11, and #12) contain the analytical results for this sampling event. 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 25 through 31, 2010.

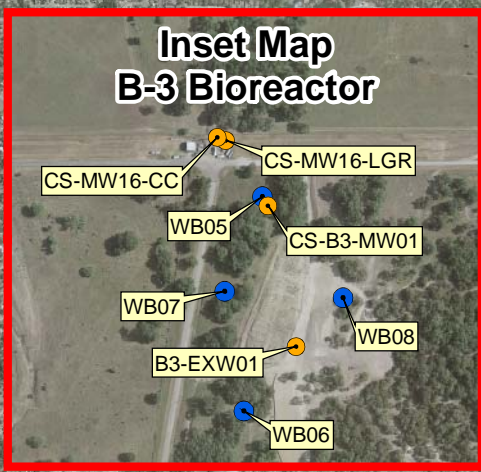
Concentrations of the VOCs detected in March 2010 are presented in **Table 2-2**. Full analytical results from the March 2010 sampling event are presented in **Appendix B**. As shown in **Table 2-1**, 39 samples were scheduled for collection in March 2010 and all samples were collected.

In January 2010 routine semi-annual maintenance was performed on the GAC treatment systems installed at 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 all samples were non-detect. GAC filtered samples will be collected again in September 2010.

Based on historical detections, the lateral extent of VOC detections extends approximately 0.5 mile beyond the south and west boundaries of CSSA. Detections of VOCs have extended south to well LS-4 and west to I10-7 (**Figure 2-1**).



# Inset Map B-3 Bioreactor



0 1,250 2,500 3,750 5,000 Feet

### Sampled Wells March 2010

- > MCL (VOC's only)
- > RL (VOC's only)
- > MDL (VOC's only)
- ND
- Other Wells
- Westbay Wells
- Fence Line

Figure 2-1

On-Post and Off-Post Well Sampling  
Locations for March 2010

Camp Stanley Storage Activity

**PARSONS**



**Table 2-2  
March 2010 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	Comments
Fair Oaks	FO-8	3/3/2010	--	--	--	--	--	--	
	FO-22	3/3/2010	--	--	--	--	--	--	
	FO-J1	3/2/2010	--	--	--	<b>0.21F</b>	--	--	
Hidden Springs	HS-2	3/3/2010	--	--	--	<b>0.19F</b>	--	--	
IH-10	I10-2	3/3/2010	--	--	--	<b>0.19F</b>	--	--	last detection in March 2005
	I10-4	3/2/2010	--	--	--	<b>0.69F</b>	<b>0.21F</b>	--	significant decrease in PCE/TCE concentration since last quarter
	I10-4 FD	3/2/2010	--	--	--	<b>0.59F</b>	<b>0.20F</b>	--	
	I10-5	3/3/2010	--	--	--	--	--	--	
	I10-7	3/2/2010	--	--	--	--	--	--	
Jackson Woods Subdivision	I10-8	3/3/2010	--	--	--	--	--	--	
	JW-5	3/2/2010	--	--	--	--	--	--	
	JW-7	3/4/2010	--	--	--	<b>0.46F</b>	--	--	
	JW-8	3/4/2010	--	--	--	<b>0.19F</b>	--	--	
	JW-9	3/4/2010	--	--	--	--	--	--	
	JW-14	3/2/2010	--	--	--	--	--	--	
	JW-15	3/2/2010	--	--	--	--	--	--	
	JW-27	3/4/2010	--	--	--	--	--	--	
	JW-27 FD	3/4/2010	--	--	--	--	--	--	
	JW-28	3/4/2010	--	--	--	--	--	--	
Leon Springs Villas	JW-29	3/4/2010	--	--	--	--	--	--	
	JW-30	3/2/2010	--	<b>0.21F</b>	--	<b>0.15F</b>	--	--	
	JW-31	3/2/2010	--	--	--	--	--	--	
	LS-1	3/1/2010	--	<b>0.36F</b>	--	<b>0.35F</b>	--	--	
	LS-4	3/1/2010	--	--	--	<b>0.17F</b>	--	--	
	LS-5	3/1/2010	--	--	--	<b>1.1F</b>	<b>2.7</b>	--	
	LS-6	3/1/2010	--	--	--	<b>1.1F</b>	<b>0.23F</b>	--	
LS-6-A2	3/1/2010	--	--	--	--	--	--	Post-GAC sample	
Old Fredricksburg Road	LS-7	3/1/2010	--	--	--	<b>0.99F</b>	<b>0.50F</b>	--	
	LS-7-A2	3/1/2010	--	--	--	--	--	--	Post-GAC sample
	LS-7-A2 FD	3/1/2010	--	--	--	--	--	--	Post-GAC sample
	OFR-1	3/3/2010	--	--	--	<b>0.31F</b>	--	--	
	OFR-3	3/1/2010	--	--	--	<b>2.3</b>	<b>2.4</b>	--	
Ralph Fair Road	OFR-3-A2	3/1/2010	--	--	--	--	--	--	Post-GAC sample
	OFR-4	3/5/2010	--	--	--	--	--	--	
	OFR-4 FD	3/5/2010	--	--	--	--	--	--	
	RFR-9	3/5/2010	--	--	--	--	--	--	
	RFR-10	3/1/2010	--	<b>0.21F</b>	--	<b>13</b>	<b>7.5</b>	--	
	RFR-10-A2	3/1/2010	--	--	--	--	--	--	Post-GAC sample
	RFR-10-B2	3/1/2010	--	--	--	--	--	--	Post-GAC sample
	RFR-11	3/1/2010	--	--	--	<b>1.4</b>	--	--	
RFR-11-A2	3/1/2010	--	--	--	--	--	--	Post-GAC sample	
RFR-12	3/3/2010	--	--	--	<b>0.26F</b>	<b>0.38F</b>	--	last detection in March 2005	
RFR-14	3/3/2010	--	--	--	<b>0.21F</b>	--	--		
<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>	= Above the MDL
<b>BOLD</b>	= Above the RL
<b>BOLD</b>	= Above the 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 2010 sampling are summarized as follows:

- PCE and TCE exceeded the MCL in well RFR-10 in March 2010. Well RFR-10 is equipped with a GAC treatment system.
- PCE and/or TCE were detected above the Reporting Limits (RLs) in drinking water wells LS-5, OFR-3 and RFR-11. Two of these wells (OFR-3 and RFR-11) have GAC treatment systems in place, and well LS-5 is monitored quarterly (and has never exceeded the MCL). A quote for GAC installation at LS-5 has been received and will be acted on quickly, if VOC levels in LS-5 rise above 90% of the applicable MCL.
- Low levels (below the RL) of PCE, TCE and/or *cis*-1,2-DCE were also detected in wells FO-J1, HS-2, I10-2, I10-4, I10-4 field duplicate, JW-7, JW-8, JW-30, LS-1, LS-4, LS-6, LS-7, OFR-1, RFR-12 and RFR-14.
- 1,1-DCE, *trans*-1,2-DCE and vinyl chloride were not detected in any off-post wells in March 2010.
- Wells I10-2 and RFR-12 had detections for the first time since March 2005. These wells will be moved from annual back to the quarterly sampling schedule.
- No VOCs were detected in wells FO-8, FO-22, I10-5, I10-7, I10-8, JW-5, JW-9, JW-14, JW-15, JW-27, JW-27 field duplicate, JW-28, JW-29, JW-31, OFR-4, OFR-4 filed duplicate and RFR-9.
- GAC filtered samples were collected in March 2010. All GAC filtered samples were non-detect indicating the GAC units are functioning properly. The next GAC filtered samples will be collected in September 2010.
- Semi-annual GAC maintenance was performed in January 2010; the next semi-annual GAC maintenance will be due in July 2010.
- In the event additional wells are located to the west and southwest of CSSA, they may be added to future sampling events.
- In accordance with project DQOs, the rationale for the selection of 31 wells to be sampled in June 2010 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 2003).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a ½ mile radius of CSSA.	Partially	Replace wells where no VOCs were detected with wells that may be identified in the future, located to the west and southwest of 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 2003). 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 2003).	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 2010 QUARTERLY OFF-POST**  
**GROUNDWATER ANALYTICAL RESULTS**



**Appendix B**  
**March 2010 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
FO-8	3/3/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
FO-22	3/3/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
FO-J1	3/2/2010	0.30U	0.16U	0.19U	<b>0.21F</b>	0.16U	0.23U
HS-2	3/3/2010	0.30U	0.16U	0.19U	<b>0.19F</b>	0.16U	0.23U
I10-2	3/3/2010	0.30U	0.16U	0.19U	<b>0.19F</b>	0.16U	0.23U
I10-4	3/2/2010	0.30U	0.16U	0.19U	<b>0.69F</b>	<b>0.21F</b>	0.23U
I10-4 FD	3/2/2010	0.30U	0.16U	0.19U	<b>0.59F</b>	<b>0.20F</b>	0.23U
I10-5	3/3/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
I10-7	3/2/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
I10-8	3/3/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-5	3/2/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-7	3/4/2010	0.30U	0.16U	0.19U	<b>0.46F</b>	0.16U	0.23U
JW-8	3/4/2010	0.30U	0.16U	0.19U	<b>0.19F</b>	0.16U	0.23U
JW-9	3/4/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-14	3/2/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-15	3/2/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-27	3/4/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-27 FD	3/4/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-28	3/4/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-29	3/4/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
JW-30	3/2/2010	0.30U	<b>0.21F</b>	0.19U	<b>0.15F</b>	0.16U	0.23U
JW-31	3/2/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
LS-1	3/1/2010	0.30U	<b>0.36F</b>	0.19U	<b>0.35F</b>	0.16U	0.23U
LS-4	3/1/2010	0.30U	0.16U	0.19U	<b>0.17F</b>	0.16U	0.23U
LS-5	3/1/2010	0.30U	0.16U	0.19U	<b>1.1F</b>	<b>2.7</b>	0.23U
LS-6	3/1/2010	0.30U	0.16U	0.19U	<b>1.1F</b>	<b>0.23F</b>	0.23U
LS-6-A2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
LS-7	3/1/2010	0.30U	0.16U	0.19U	<b>0.99F</b>	<b>0.50F</b>	0.23U
LS-7-A2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
LS-7-A2 FD	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
OFR-1	3/3/2010	0.30U	0.16U	0.19U	<b>0.31F</b>	0.16U	0.23U
OFR-3	3/1/2010	0.30U	0.16U	0.19U	<b>2.3</b>	<b>2.4</b>	0.23U
OFR-3-A2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
OFR-4	3/5/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
OFR-4 FD	3/5/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
RFR-9	3/5/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
RFR-10	3/1/2010	0.30U	<b>0.21F</b>	0.19U	<b>13</b>	<b>7.5</b>	0.23U
RFR-10-A2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
RFR-10-B2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
RFR-11	3/1/2010	0.30U	0.16U	0.19U	<b>1.4</b>	0.16U	0.23U
RFR-11-A2	3/1/2010	0.30U	0.16U	0.19U	0.15U	0.16U	0.23U
RFR-12	3/3/2010	0.30U	0.16U	0.19U	<b>0.26F</b>	<b>0.38F</b>	0.23U
RFR-14	3/3/2010	0.30U	0.16U	0.19U	<b>0.21F</b>	0.16U	0.23U

<b>BOLD</b>	= Above the MDL
<b>BOLD</b>	= Above the RL
<b>BOLD</b>	= Above the 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.