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.

Juin Burdey

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 privatelyowned 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.

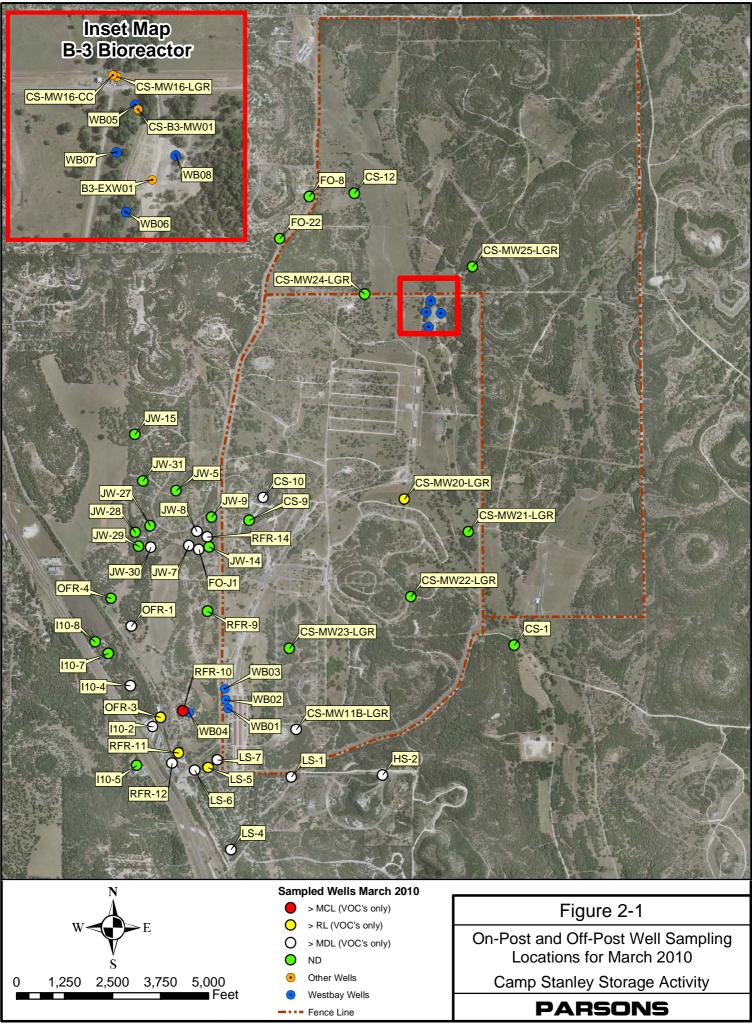
Concentrations of the VOCs detected in March 2010 are presented in **Table 2-2**. Full analytical results from the March 2010 sampling event are presented in **Appendix B**. As shown in **Table 2-1**, 39 samples were scheduled for collection in March 2010 and all samples were collected.

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 110-7 (**Figure 2-1**).

Table 2-1 Sampling Rationale for March 2010

		Sampling	2010 ec Mar	Dee		200 June	Mar	Daa	008 Sont		Mar	Dee	007 Sont		Mar	Dee	006 Sont		Mar	Dag	05 Sont		Me	nt Do-	2004 June Se	Mo-	nt D	2003		Mar	Dee	2002 20 Sont	lan I		2001
VOCs detected are greater		Frequency: main electricity has been disconnected			_		NS	NS	NS	NS	Mar	NS		NS NS		NS		NS	Mar	NS		NS NS			NS N		-	IS N		Mar		S NS			N N
90% of the MCL. Sam						NS	IN S	NS	NS	NS		NS	NS	NS		NS	NS	NS		NS		NS			NS N			IS N			NS				NS N
monthly; quarterly after		As needed, once annually			NS	IND	NS		NS	145	NS		NS	NB	NS	NS		IND	NS	NS	NS		NS	S NS				S N			NS		N		NS N
installation.		· · · · · · · · · · · · · · · · · · ·				NS	T\D		NS	NS	T B		NS	NS		115		NS		IND.	NS	NS				NS		S N		NS				S N	
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VOCs detected are greater			NS															NS			NS	NS	NS	S NS	NS N	S NS	IS N	S N	N	NS	NS	S NS	NS N	IS N	NS N
80% of the MCL. The			Yes															ing.	IND.	IND	145	115	115	5 115	110 1	5 115	10 1	5 1		110	110	5 115	10 11	5 1	NS NS
placed on a monthly sa				NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	S NS	Ň	S NS	IS N	N		NS	NS	NS	NS	N	NS
schedule until GAC ins						NS	110	NS	NS	NS	110	NS	NS	NS	110		NS		110	110	110		115	5 115		5 115				110	110	110	10		. 15
then quarterly sampling			Yes						NA	NA	NA	NA		NA												S	N								NS
GAC installation.		As needed, once annually		NS	NS	NS			NS	NS		NS		NS	NS		NS	NS	NS		NS	NS	NS	S	NS N			S N	N	NS		S NS	NS N	S N	
		Qtrly, 1 year thru Dec. 10																						S	N	S NS	IS N	N			NS	S NS	N	S	NS N
		Qtrly, for delineation	Yes		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS	S NS	NS N	S NS	IS N	S N	N	NS	NS	S NS	NS N	S N	NS N
VOCs detected are less		As needed, once annually	S Yes	NS	NS	NS										NS	NS	NS					NS			S NS	IS N	S N	N	NS	NS	S NS	NS N	S N	NS N
of the MCL (<4.0 ppb)	[_]	As needed, once annually	S NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS			NS	NS	NS		NS	S NS	N	S NS	IS N	N		NS	NS	NS	NS	S N	N
ppb for PCE & <4.0 pp			Yes																													S NS	NS N		
ppb for TCE). After for																																S NS			
of stable results the we				NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS													
removed from quarterly		As needed	S NS		NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	S NS	NS N	S NS	IS N	S N	N	NS		S NS	NS N	S N	NS N
	all back	Access agreement expired, owner won't call bac	A NA	NA	NA			NS	NS		NS			NS	NS	NS		NS	NS	NS	NS	NS		S NS	NS N	S	IS N	S N	N	NS		S NS	NS N	S N	N
		As needed, once annually	S NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	S NS	N	S NS	IS N	N		NS		S NS	NS N	S N	N
This well has a GAC fi		Qtrly, due to location																	Tol																
unit installed by CSSA	I "	As needed, once annually	S Yes			NS		NS	NS	NS		NS		NS		NS	NS	NS					NS	S NS	NS N	S NS	IS N	S N	N	NS	NS	S NS	NS N	S N	NS N
samples are collected e		Wellowner declined access.	A NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NS	NS			NS	NS		NS	NS										S	N	S	NS N
months.						NS						NS									NS		NS	S NS	Ň	S NS	IS N	N		NS	NS	S NS	NS N	S N	NS N
A1 - after GAC caniste		Qtrly, due to location	Yes								NS	NS	NS															S	N	NS	NS	S NS	NS N	S N	NS N
A2 - after GAC caniste		Qtrly, due to location																												NS	NS	S NS	NS N	S N	NS N
*JW-9-A2 is the well of		Qtrly, due to location	Yes																												NS	S NS	NS N	S N	NS N
system, not a CSSA GA		Otrly 1 year			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	. NA	NA	A NA	NA N	A NA	AN	A NA	. N	NA	NA	A NA	NA N	A N	NA N.
- ,		QED low flow pump installed	Yes								NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	S NS	N										
		Well is offline, to be plugged soon		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			NS			NS															
Yes To be sampled in Marc				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS		NS		NS		NS		NS		NS	NS	S	N	S	N		NS	S	NS N	S N	NS N
F					NS		NS	NS	NS	NS	NS	NS	NS	NS																					
		GAC unit removed	A NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS		NS		NS		NS		NS		NS	NS	S	N	S	Ν		NS	S	N	S	NS N
FT		QED low flow pump installed									NS	NS	NS	NS																					
First event for sampling		Qtrly, 1 year thru Dec. 10																																	
		Qtrly, 1 year thru Dec. 10	Yes																																
NS Not sampled for that ev		Biannually (Mar & Sept)		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS	S	N	IS	Ν		NS	5	N		
		Qtrly, 1 year thru Dec. 10	Yes																																
No VOCs detected. Sa		Biannually (Mar & Sept)	S Yes	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS	S	N	ÍS	Ν		NS	5	N		
an as needed basis.		Qtrly, 1 year thru Dec. 10	Yes																																NS
		Well was P&A by Centex	A NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA																S	NS N
NA Not applicable, sample		Qtrly, 1 year thru Sept. 10	Yes																																
longer be collected from	I "	Biannually (Mar & Sept)				NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS		N	IS	N		NS		N		NS N
locaiton due to reason		As needed, once annually	S Yes	NS		NS			NS	NS		NS	NS	NS			NS	NS		NS		NS		S NS	NS N		N			NS	NS	S NS			
		As needed, once annually				NS			NS	NS	NS			NS				NS	NS			NS					IS	S N	N	NS	NS	S NS	NS N	S N	NS N
-		As needed, once annually	NS			NS			NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS	Tol	S NS	NS N	S	IS N	S N	N	NS	NS	S NS	NS N	S N	NS N
		As needed, once annually				NS			NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		S NS	NS N	S	IS N	S N	N	NS	NS	S NS	NS N	S N	NS N
		Plugged & abandoned	A NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	S	NS N			S N				S NS	NS N	S N	Ν
		Plugged & abandoned	A NA						NA			NA	NA					NS	NS		NS	NS		S	NS N		IS	S N			NS	NS		S N	
		As needed, once annually	S NS	NS	NS		NS	NS	NS		NS	NS	NS		NS		NS		NS	NS	NS		NS	S NS	N	S NS	IS N	N		NS	NS	NS	NS	S N	Ν
		Qtrly, 1 year thru Dec. 10				NS		NS		NS	NS			NS		NS		NS				NS			NS		N				NS			N	
		Qtrly, 1 year thru Dec. 10																																	
		Biannually (Mar & Sept)		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS	S	N		Ν		NS		N		
		Biannually (Mar & Sept)				NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS	S	N			NS	NS	S NS			
		Qtrly, 1 year thru Dec. 10																																	
		Biannually (Mar & Sept)		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NS	S	N	ÍS	Ν		NS	S	N		
		As needed, once annually			NS	NS			NS				NS	NS			NS																		
		As needed, once annually		NS			NS	NS			NS	NS				NS								led	Vell Instal										
		Qtrly, 1 year thru Sept. 10						1.2								.~				stalled	Vell In	V							+		1				
	33					e GAC	Total Pr	,																	<u> </u>			I		1					
		5.																																	
	6					st GAC	otal Pos	Т																											



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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	РСЕ	TCE	Vinyl Chloride	Comments
	FO-8	3/3/2010							
Fair Oaks	FO-22	3/3/2010							
	FO-J1	3/2/2010				0.21F			
Hidden Springs	HS-2	3/3/2010				0.19F			
	I10-2	3/3/2010				0.19F			last detection in March 2005
	I10-4	3/2/2010				0.69F	0.21F		
									significant decrease in PCE/TC
IH-10	I10-4 FD	3/2/2010				0.59F	0.20F		concentration since last quarter
_	I10-5	3/3/2010							
_	<u>I10-7</u>	3/2/2010							
	I10-8	3/3/2010							
_	JW-5	3/2/2010							
_	JW-7	3/4/2010				0.46F			
	JW-8	3/4/2010				0.19F			
	JW-9 JW-14	3/4/2010							
Jackson Woods	JW-14 JW-15	3/2/2010 3/2/2010							
Subdivision	JW-13 JW-27	3/4/2010							
505017151011	JW-27 JW-27 FD	3/4/2010							
F	JW-28	3/4/2010							
F	JW-28 JW-29	3/4/2010							
-	JW-30	3/2/2010		0.21F		0.15F			
	JW-31	3/2/2010							
	LS-1	3/1/2010		0.36F		0.35F			
	LS-4	3/1/2010				0.17F			
	LS-5	3/1/2010				1.1F	2.7		
Leon Springs	LS-6	3/1/2010				1.1F	0.23F		
Villas	LS-6-A2	3/1/2010							Post-GAC sample
	LS-7	3/1/2010				0.99F	0.50F		•
	LS-7-A2	3/1/2010							Post-GAC sample
	LS-7-A2 FD	3/1/2010							Post-GAC sample
	OFR-1	3/3/2010				0.31F			
Old	OFR-3	3/1/2010				2.3	2.4		
Fredricksburg	OFR-3-A2	3/1/2010							Post-GAC sample
Road	OFR-4	3/5/2010							
	OFR-4 FD	3/5/2010							
	RFR-9	3/5/2010							
	RFR-10	3/1/2010		0.21F		13	7.5		
	RFR-10-A2	3/1/2010							Post-GAC sample
Ralph Fair Road	RFR-10-B2	3/1/2010							Post-GAC sample
	RFR-11	3/1/2010				1.4			
_	RFR-11-A2	3/1/2010							Post-GAC sample
	RFR-12	3/3/2010				0.26F	0.38F		last detection in March 2005
	RFR-14	3/3/2010				0.21F			
_		Laboratory 1						0.00	
	Method Detection		0.12	0.07	0.08	0.06	0.05	0.08	
		ting Limit (RL)		1.2	0.6	1.4	1	1.1	
	Max. Contamina	nt Level (MCL)	7	70	100	5	5	2	
-	BOLD	-							
_	BOLD	= Above the M							
	BOLD	= Above the R							
	BOLD	= Above the M	ICL						
-									1
	Il samples were anal	, , ,	ic.						
	OC data reported in	•							
	bbreviations/Notes:								
	D	Field Duplicate							
	CE	Trichloroethen							
	CE	Tetrachloroeth							
Ľ	DCE	Dichloroethene	9						
_									
	Data Qualifiers	wood for both	dataat-1 TI			ha ia at 1 - 1	out the MDI		
	The analyte was anal	iyzea ior, but not	uetected. Th	ie associated	numerical val	ue is at or be	low the MDL	J.	1
	-The analyte was pos	41	1	·		1 41. DT			

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, 110-2, 110-4, 110-4 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**.

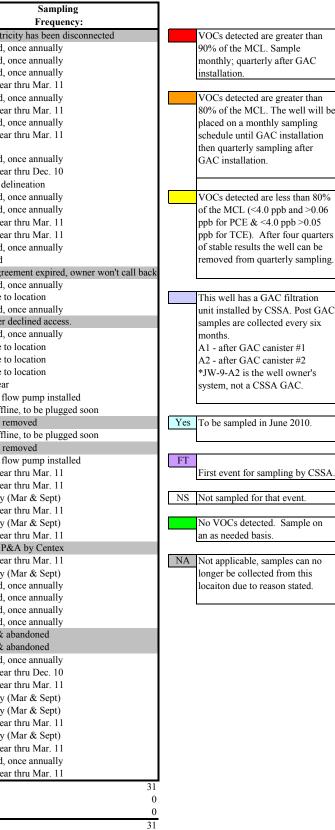
Table 3-1Sampling Rationale for June 2010

																							sampin	ing ivan	ionaic i	or sund	2010										
	20)01		20	002			20	003			20	04			20)05			2	006			20	007			20	08			20	009		20	010	
Well ID	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	
DOM-2		NS		NS		NS		NS		NS		NS		NS			NS			NS	NS	NS		NS	NS	NS		NS	NS	NS	NS	NS	NA	NA	NA	NA	main electrici
FO-8	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS			NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	As needed, or
FO-17	NS	NS		NS		NS		NS		NS			NS	NS			NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS	Yes	As needed, on
FO-22		NS	NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS	NS		NS	NS	NS		NS	NS	NS			As needed, or
FO-J1												NS						NS	NS																		Qtrly, 1 year t
HS-1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS															NS		As needed, or
HS-2	NS																																				Qtrly, 1 year t
HS-3	NS		NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS	2.40	NS		NS	2.40	NS	NS	NS	2.10	NS	NS	NS	2.20	NS	NS	NS		As needed, or
I10-2	NG									NG										NS	NS	NS		NS	NS	NS	27.4	NS	NS	NS		NS	NS	NS			Qtrly, 1 year t
I10-4	NS	NC	NG	NG	NC		NG	NG	NG	NS	NC	NG	NG		NG	NG	NG		NG	NC	NC		NG	NA	NA	NA	NA	NA	NA	NG		NG	NG	NG			Quarterly
I10-5	NS NS	NS NS	NS	NS		NC	NS	NS	NS	NC	NS NS	NS	NS NS		NS	NS	NS		NS	NS	NS.		NS	NS	NS	NS	NS	NS	NS	NS		NS	NS	NS			As needed, on
I10-7			NC			NS	NC	NC		NS NS	NS	NC		NC	NC	NC	NS		NG	NC	NC		NC	NC	NC		NC	NC	NC		NC	NC	NC				Qtrly, 1 year t
I10-8 JW-5	NS NS	NS NS	NS NS	NS NS		NS NS	NS NS	NS NS		NS	NS	NS NS	NS	NS NS	NS NS	INS.	IN 5		NS	NS NS		NC	NS	NS	NS		NS	NS	NS		NS	NS NS	NS NS	NS			Qtrly, for deli
JW-5 JW-6	IND	NS	NS	IND	NS	NS	NS	IND	NS	NS	NS	IND	NS		NS		NS	NS	NS	IND	NS		NS		NS	NS	NS		NS	NS	NS	IND	NS	NS	NS		As needed, or As needed, or
JW-0 JW-7		NS	NS	NS		NS	NS	NS		IND	IND		IND	IND	IND		140	IND	IND		IND	IND	IND		INS.	IND	113		113	IND	IND		INS .	IND	185		Qtrly, 1 year t
JW-8	NS		NS					IND																									<u> </u>				Qtrly, 1 year t Qtrly, 1 year t
JW-8 JW-9	145	145	IND	IND	IND.	IND.	IND									NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	As needed, or
JW-9-A2*	NS	NS	NS	NS	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	As needed
JW-12	IND.	NS	NS	NS			NS	NS		NS	NO	NS		NS	145	NS		NS	NS		IND	NS	NS	NS	IND.	145	NS	145	NS	NS	IND	145	NA	NA	NA		Access agreen
JW-12 JW-13		NS	NS	NS			NS	IND.	NS	NS	NS	115	NS	NS	NS	IND.	NS		NS	IND.	NS		NS	ND	NS	NS	NS		NS	NS	NS		NS	NS	NS		As needed, or
JW-14		115	110	110	115		115		115	110	110		110	110	115		110	110	Tol		TID	110	110		110	110	110		110	110	11D		RU	110	110		Qtrly, due to l
JW-15	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS					NS	NS	NS		NS	NS	NS		NS	NS	NS		NS	NS	NS			As needed, or
JW-26	NS	NS		NS	- 10			- 10							NS	NS	NS		NS				NS		NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Wellowner de
JW-27	NS	NS	NS	NS	NS	NS	NS		NS	NS	NS		NS	NS			NS									NS						NS	NS	NS			As needed, or
JW-28	NS	NS	NS	NS		NS	NS	NS																	NS	NS	NS										Qtrly, due to l
JW-29	NS	NS	NS	NS	NS	NS	NS																														Qtrly, due to l
JW-30	NS	NS	NS	NS	NS	NS																														Yes	Qtrly, due to l
JW-31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			Yes	Qtrly 1 year
LS-1													NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS									Yes	QED low flow
LS-2																		NS			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Well is offline
LS-2/LS-3-A1	NS	NS	NS	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	GAC unit rem
LS-3																								NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Well is offline
LS-2/LS-3-A2	NS	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		GAC unit rem
LS-4																								NS	NS	NS	NS									Yes	QED low flow
LS-5																																					Qtrly, 1 year t
LS-6																																					Qtrly, 1 year t
LS-6-A2				NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			Biannually (N
LS-7								2.10		2.10				2.10				2.10		2.20		2.10		2.10		2.10		2.10		2.10							Qtrly, 1 year t
LS-7-A2	210			NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	 ′	NS			Biannually (N
OFR-1	NS																			NT 4	NT A	NT A	NT A	NT 4	NY A	NT A	NY A	NT A	NT A	NT A	DI A	NT A		NT A	NT 4		Qtrly, 1 year t
OFR-2	NS	NS																		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Well was P&
OFR-3	NG	NG		NG		NG		NG		NG		NG		NC		NG		NC		NC		NG		NG		NG		NG		NG		NG		NG			Qtrly, 1 year 1
OFR-3-A2	NS		NC	NS		NS	NC	NS		NS NS		NS	NS	NS NS		NS		NS NS		NS	NS	NS		NS	NC	NS NS		NS	NC	NS		NS	NS	NS NS			Biannually (N As needed, or
OFR-4 RFR-3	NS	NS	NS NS	NS		NS	NS		NS	IND		IN S	IN S	INS	NS		NS	INS.	NS			IN 5		NS	NS NS	INS	NS	NS	NS NS	INS	NS	NS	NS	NS	NS		As needed, on As needed, or
RFR-4	NS	NS	NS	NS		NS	NS	NS		NS		NS	NS	NS	Tol	NS		NS	IND	NS		NS	IND	NS	NS	NS	143	NS	NS		NS	NS	NS		NS		As needed, or
RFR-5	NS	NS	NS	NS		NS		NS		NS		NS		NS	101	NS				NS	NS	NS		NS	NS	NS		NS	NS		NS	NS	NS		NS		As needed, or As needed, or
RFR-6	115	NS	NS		NS	145	NS		NS	145	NS	NS		145	NS			NA	NA				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Plugged & ab
RFR-7		NS	NS	110		NS	NS		NS		NS					NS		1 1 1	NS		NS		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			Plugged & ab
RFR-8		NS	NS		NS			TID		NS		110		NS		110		NS		TID	NS		NS		NS	NS	NS	1111	NS	NS	NS	1.1.1	NS	NS	NS		As needed, or
RFR-9		110	NS		NS	NS	NS		110	NS	NS	NS	110	NS	NS	NS		NS	NS	NS	110	NS	NS	NS	110	NS	NS	NS	110	NS	NS	NS	IND	110	110		Qtrly, 1 year t
RFR-10			110		110	110	110			115	110	110		110	110	110		TID	115	TID		110	110	TID		110	110	110		110	110	110					Qtrly, 1 year t
RFR-10-A2				NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			Biannually (N
RFR-10-B2					NS	NS	NS	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			Biannually (N
RFR-11					- 10	1.0		- 10				- 10						- 10		- 10		- 10		110		1.10						- 10		1.10			Qtrly, 1 year t
RFR-11-A2				NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			Biannually (N
RFR-12				~		~		-		Ĩ		~		~						NS	NS			NS	NS	NS		NS	NS	NS		NS	NS	NS			Qtrly, 1 year t
RFR-13		1					1	1	1		V	Vell In	stalled								NS		NS		NS	NS	NS		NS	NS	NS		NS	NS	NS		As needed, or
RFR-14		1	1		1		1		1							١	Well In	stalled																			Qtrly, 1 year t
<u> </u>	•																																7	Fotal Pr	e GAC		

Total Pre GAC Total Post GAC

Total # of first time samples

Total # of samples:



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.	accordance with the procedures	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 ¹ / ₂ 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	Samples were analyzed in accordance with the CSSA QAPP, and approved variances. A chemist verified all data.	Yes	NA
	quality assurance requirements.	All data flagged with a "U" and "J" are usable for characterizing contamination.	Yes	NA

Appendix A Evaluation of Data Quality Objectives Attainment

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	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

			cis-1,2-	trans-1,2-			Vinyl
Well ID	Sample Date	1,1-DCE	DCE	DCE	РСЕ	TCE	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	0.21F	0.16U	0.23U
HS-2	3/3/2010	0.30U	0.16U	0.19U	0.19F	0.16U	0.23U
I10-2	3/3/2010	0.30U	0.16U	0.19U	0.19F	0.16U	0.23U
I10-4	3/2/2010	0.30U	0.16U	0.19U	0.69F	0.21F	0.23U
I10-4 FD	3/2/2010	0.30U	0.16U	0.19U	0.59F	0.20F	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	0.46F	0.16U	0.23U
JW-8	3/4/2010	0.30U	0.16U	0.19U	0.19F	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	0.21F	0.19U	0.15F	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	0.36F	0.19U	0.35F	0.16U	0.23U
LS-4	3/1/2010	0.30U	0.16U	0.19U	0.17F	0.16U	0.23U
LS-5	3/1/2010	0.30U	0.16U	0.19U	1.1F	2.7	0.23U
LS-6	3/1/2010	0.30U	0.16U	0.19U	1.1F	0.23F	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	0.99F	0.50F	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	0.31F	0.16U	0.23U
OFR-3	3/1/2010	0.30U	0.16U	0.19U	2.3	2.4	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	0.21F	0.19U	13	7.5	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	1.4	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	0.26F	0.38F	0.23U
RFR-14	3/3/2010	0.30U	0.16U	0.19U	0.21F	0.16U	0.23U

BOLD	= Above the MDL
BOLD	= Above the RL
BOLD	= 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.