



DEPARTMENT OF THE ARMY  
CAMP STANLEY STORAGE ACTIVITY, MCAPP  
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

February 21, 2008

U-091-08

Mr. Bryan Smith  
Texas Commission on Environmental Quality  
Industrial and Hazardous Waste Permits Section  
P.O. Box 13087 (MC-130)  
Austin, TX 78711-3087

Subject: Monthly Status Report (Month 8 - December 2007) of the Pilot Study Class V Aquifer Remediation Injection Wells at Camp Stanley Storage Activity, Boerne, Texas, TCEQ Authorization No. 5X2600431; WWC12002216; CN602728206/RN104431655

Dear Mr. Smith:

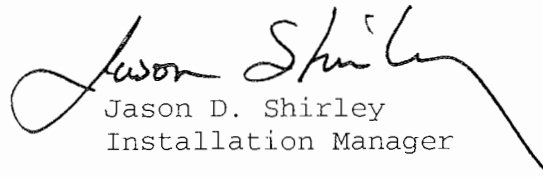
The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Materiel Command, U.S. Army, is submitting this monthly report summarizing the injection activities performed at the on-post Solid Waste Management Unit (SWMU) B-3 site. The activities performed are part of the planned SWMU B-3 Pilot Study being performed to evaluate the effectiveness of enhanced anaerobic biodegradation (EAB) for treatment of chlorinated compounds in groundwater. The pilot study activities include the injection of recovered groundwater into mulch/gravel filled bioreactor trenches.

This monthly report contains data as specified by the subject Texas Commission on Environmental Quality (TCEQ) Underground Injection Control (UIC) permit for the month of December 2007 (Month 8). The monthly reporting data includes twice monthly samples of the injected groundwater for volatile organic concentrations (VOCs) and total dissolved solids (TDS) and field collected parameters including injection volumes, injection pressures and the pH of recovered groundwater.

Between November 30, and December 31, 2007 approximately 217,777 gallons of groundwater from well CS-MW16-LGR, were injected into SWMU B-3 bioreactor trench 1. A total of 1,559,482 gallons of recovered groundwater from CS-MW16-LGR and CS-MW16-CC have been injected into the bioreactor trench 1 since startup of the bioreactor. Samples of the injected groundwater were collected on December 3, 2007 and December 18, 2007. Results of analysis are summarized in Table 1 with the laboratory data packages attached. Field forms which contain operating pressures and pH readings for the reporting period are also attached.

If you have any questions regarding the information contained in this letter, please feel free to contact Glare Sanchez, CSSA Environmental Program Manager, at (210) 698-5208 or Ken Rice, Parsons, at (512) 719-6050.

Sincerely,



Jason D. Shirley  
Installation Manager

Attachments

cc: Glare Sanchez, CSSA Environmental Program Manager  
Kent Rohlof, AFCEE (ltr only)  
Julie Burdey, Parsons  
Ken Rice, Parsons  
Brian Vanderglas, Parsons  
File: 744223.11000

Table 1  
B3 - UIC Analytical Results

Sample ID Sample Date Sample Type Sampling Method Lab ID	B-3 UIC			B-3 UIC			B-3 UIC			B-3 UIC			B-3 UIC			B-3 UIC		
	Lab MDL	Lab PQL	Criteria (RCRA Haz.)	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution
SW8260B (µg/L)																		
Cis-DCE	0.16	1.2	—	78.0		1	54.0		1	60.0		1	89.0		1	21.0		1
Trans-DCE	0.19	0.6	—	3.7		1	2.0		1	1.6		1	4.5		1	0.19	U	1
TCE	0.16	1.0	500	90.0		1	59.0		1	67.0		1	95.0		5	28.0		1
PCE	0.15	1.4	700	27.0		1	14.0		1	19.0		1	28.0		1	27.0		1
Toluene	0.17	1.1	—	0.17	U	1	0.19	J	1	0.17	U	1	0.17	U	1	1.0	J	1
Vinyl Chloride	0.23	1.1	200	0.23	U		0.23	U		0.23	U		0.23	U		0.23	U	
EPA 160.1 (mg/L)																		
TDS	4.4	10	—	388		1	345		1	385		1	382		1	328		1
Field measured																		
pH				6.97			7.04			7.55			7.15			7.09		

Tables present all laboratory results for analytes.  
Data packages for laboratory analysis results are presented in Attachment 1.  
All samples were analyzed by APPL Laboratory Services.  
pH results reported were field measured  
UIC criteria specified in 40 CFR 261.24 Table 1

**Data Qualifiers:**  
J- The analyte was positively identified, the quantitation is an estimation.  
U- The analyte was analyzed for, but not detected. The associated numerical value is the MDL.

**Abbreviations and Notes:**  
PQL Practical Quantitation Limit  
MDL Method Detection Limit  
N1 Environmental Sample  
SQL Sample Quantitation Limit  
UIC Underground Injection Control

### Bioreactor Monitoring

Personnel: *Remington, Elliott, Rice, Lasker*  
**Trench Sumps Water Levels ('BTOC')**

Sump ID	Sump Depth (ft BTOC)	Sump Water Level (ft BTOC)	pH	Temp (deg. C)	Sp Cond (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (Y)	Notes
Date: <i>12/7/07</i>		Time: <i>10:00</i>							
B3-T1-1	12.9	<i>10.74</i>	<i>6.38</i>	<i>22.78</i>	<i>0.870</i>	<i>-188.7</i>	<i>0.64</i>	✓	
B3-T1-2	12.4	<i>10.58</i>	<i>6.53</i>	<i>22.20</i>	<i>0.845</i>	<i>-202.9</i>	<i>0.48</i>		
B3-T1-3	12.85	<i>9.54</i>	<i>6.38</i>	<i>22.97</i>	<i>0.881</i>	<i>-220.7</i>	<i>0.47</i>		
B3-T2-1	9.67	<i>dry - no tone</i>							
B3-T2-2	10.01	<i>9.40</i>							
B3-T3-1	9.96	<i>9.14</i>	<i>6.52</i>	<i>22.94</i>	<i>1.350</i>	<i>-145.5</i>	<i>0.38</i>		
B3-T3-2	7.4	<i>dry - no tone</i>							
B3-T4-1	6.32	<i>dry - no tone</i>							
B3-T5-1	9.33	<i>9.28</i>							
B3-T5-2	7.98	<i>7.86</i>							
B3-T6-1	11.45	<i>11.17</i>							
B3-T6-2	12.34	<i>12.06</i>							
B3-UIC			<i>7.09</i>	<i>21.08</i>	<i>0.515</i>	<i>-45.1</i>	<i>5.49</i>		

### B-3 Transfer System Monitoring

Flow Meters Readings							
Meter	Monday	Tuesday	Wednesday	Thursday	Friday		
Date/Time:	<i>12.3.07 0835</i>	<i>12.4.07 0900</i>	<i>12.5.07 0700</i>	<i>12.6.07 0655</i>	<i>12.7.07 0645</i>		
	Rate (gpm) / Cumulative Total (gal)						
T-1	<i>301,972</i>	<i>1594/32.67</i>	<i>319,191</i>	<i>1469/33.61</i>	<i>328,317</i>	<i>1491/23.11</i>	<i>245,306</i>
T-2	<i>0.30m</i>						
T-3	<i>1646R-137.2</i>						
T-4	<i>1300</i>						
T-5	<i>1646R-118.2</i>						
T-6							
B-3 (Total)	<i>301,972</i>	<i>319,191</i>	<i>328,317</i>	<i>345,706</i>	<i>362,616</i>		

Bag Filter Pressure Reading (Pressure Drop (PB-1) - (PB-2)) \* Note: if bag filter pressure drop is > or = 20 psi change filter.

Pressure Readings				
PB-1 - PB-2 =	<i>22 - 23.5 = 1.5</i>	PB-1 - PB-2 =	<i>24 - 24 = 0</i>	PB-1 - PB-2 =
PB-1 - PB-2 =	<i>21 - 24 = 3</i>	PB-1 - PB-2 =	<i>26 - 24 = 2</i>	PB-1 - PB-2 =
P-1				
P-2				
P-3				
P-4				

Notes: *Monday - started 16 LGR, 1600 not pumping*

Week 32  
 Month 7

Personnel		S. Elliott & E. Tarryson				
Weekly Water Level Monitoring						
Well Interval	Sampling Port Depth (ft. BTOC)	Sample Date	Sample Time	Pressure at TOC (psf)	Pressure in MP (psf)	Zone Pressure (psi)
CS-WB05-LGR-01	99	11/7/07	0900	14.06	14.13	25.63
CS-WB05-LGR-02	102		0859		14.17	32.93
CS-WB05-LGR-03A	216		0858		14.19	46.75
CS-WB05-LGR-03B	262		0857		25.82	66.71
CS-WB05-LGR-04A	277		0856		32.36	73.19
CS-WB05-LGR-04B	329		0855		55.00	95.63
CS-WB05-BS-01	362		0854		69.53	110.95
CS-WB05-CC-01	432		0853		98.73	136.44
CS-WB05-CC-02	460		0852		111.87	148.60
CS-WB06-UGR-01	20		0932	14.67	14.07	14.73
CS-WB06-LGR-01	93		0931		14.12	16.41
CS-WB06-LGR-02	174		0930		14.16	39.58
CS-WB06-LGR-03A	207		0929		14.18	51.64
CS-WB06-LGR-03B	260		0928		23.71	74.55
CS-WB06-LGR-04	320		0927		41.74	96.30
CS-WB07-UGR-01	14		0950	14.06	14.11	15.49
CS-WB07-LGR-01	90		0945		14.12	20.02
CS-WB07-LGR-02	175		0944		14.18	42.24
CS-WB07-LGR-03A	208		0943		14.20	48.89
CS-WB07-LGR-03B	257		0942		17.68	70.10
CS-WB07-LGR-04	318		0941		44.18	93.29
CS-WB08-UGR-01	38		0916	14.05	14.10	14.14
CS-WB08-LGR-01	115		0915		14.15	30.19
CS-WB08-LGR-02	193		0914		14.18	36.31
CS-WB08-LGR-03A	228		0913		14.18	48.46
CS-WB08-LGR-03B	273		0911		21.02	67.92
CS-WB08-LGR-04	341	✓	0910		50.55	97.74

### Bioreactor Monitoring

Personnel: S. Elliott, E. Tennison

#### Trench Sumps Water Levels ('BTOC')

Sump ID	Sump Depth (ft BTOC)	Sump Water Level (ft BTOC)	pH	Temp (deg. C)	SpCond (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (✓)	Notes
Date:		Time:							
B3-T1-1	12.9							✓	
B3-T1-2	12.4								
B3-T1-3	12.85								
B3-T2-1	9.67								
B3-T2-2	10.01								
B3-T3-1	9.96								
B3-T3-2	7.4								
B3-T4-1	6.32								
B3-T5-1	9.33								
B3-T5-2	7.98								
B3-T6-1	11.45								
B3-T6-2	12.34								
B3-UIC									

#### B-3 Transfer System Monitoring

Flow Meters Readings										
Meter	Monday		Tuesday		Wednesday		Thursday		Friday	
Date/Time:	12.10.07	0900	12.11.07	0833	12.12.07	0830	12.13.07	0845	12.14.07	0840
	Rate (gpm) / Cumulative Total (gal)									
T-1	16.70 / 33,943.66, 350		14.58 / 22,053.81, 957		14.91 / 23,271.395, 654		15.23 / 33,224.410, 746		426,956	
T-2										
T-3										
T-4										
T-5										
T-6										
B-3 (Total)	306,350		381,057		395,154		410,746		426,956	

Bag Filter Pressure Reading (Pressure Drop (PB-1) - (PB-2) = Note: If bag filter pressure drop is > or = 20 psi change filter.

PB-1 - PB-2 = 26 - 24 = 2    PB-1 - PB-2 = 27 - 25 = 2    PB-1 - PB-2 = 16 - 24 = 2    PB-1 - PB-2 = 26 - 24 = 2    PB-1 - PB-2 =

#### Pressure Readings

P-1				
P-2				
P-3				
P-4				

Notes: \* no water levels recorded due to intermittent weather per Ken Rice.

or weather profiling      Week 33      raining

176L B3-T1-2 → pH=6.35 Temp. = 22.52 cond. = 0.860 ORP = -166.1 DO = 0.60  
 1310 → B3-T1-3 → pH=6.30 Temp. = 22.45 cond. = 0.860 ORP = -156.1 DO = 0.51  
 SWMU B-3 Tree Mulch Bioreactor

Bioreactor Monitoring

Personnel: S. Elliott + E. Ternyson

Trench Sumps Water Levels ('BTOC)

Sample Time  
0930  
1030  
1800

Sump ID	Sump Depth (ft BTOC)	Sump Water Level (ft BTOC)	pH	Temp (deg. C)	SpCond (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (%)	Notes
Date: 12-18-07		Time: 0945							
B3-T1-1	12.9	11.54	6.25	22.15	0.827	-181.6	0.65	✓	
B3-T1-2	12.4	11.10	6.26	22.07	0.883	-161.0	-0.01 P*		
B3-T1-3	12.85	10.73	6.37	22.25	0.847	-143.4			
B3-T2-1	9.67	no tone							
B3-T2-2	10.01	4.75							
B3-T3-1	9.96	9.14							
B3-T3-2	7.4	dry - no tone							
B3-T4-1	6.32	dry - no tone							
B3-T5-1	9.33	9.31							
B3-T5-2	7.98	7.90							
B3-T6-1	11.45	11.15							
B3-T6-2	12.34	11.99							
B3-UIC			6.96	22.11	0.526	-13.2	3.10		

1400

B-3 Transfer System Monitoring

Flow Meters Readings

Meter	Monday	Tuesday	Wednesday	Thursday	Friday
Date/Time	12-17-07 0900	12-18-07 0905	12-19-07 0730	12-20-07 0923	12-21-07
Rate (gpm) / Cumulative Total (gal)					
T-1	16.16 / 32.78 432,550	15.12 / 33.16 447,450	14.36 / 32.87 460,828	14.14 / 32.55 473,690	NOT RUN
T-2					
T-3					
T-4					
T-5					
T-6					
B-3 (Total)	432,550	447,450	460,828	473,690	

Bag Filter Pressure Reading (Pressure Drop (PB-1) - (PB-2) = Note: If bag filter pressure drop is > or = 20 psi change filter.

PB-1 - PB-2 = 26 - 24 = 2	PB-1 - PB-2 = 26 - 27 = 2	PB-1 - PB-2 = 27 - 24 = 3	PB-1 - PB-2 = 27 - 24 = 3	PB-1 - PB-2 =
Pressure Readings				
P-1				
P-2				
P-3				
P-4				

Notes: \* YSI meter broke out, had to return to office replace DO membrane and recalibrate see readings at top of page

Week 34  
Month 8

Personnel: S. Elliott + E. Tennyson						
Weekly Water Level Monitoring						
Well Interval	Sampling Port Depth (ft. BTGC)	Sample Date	Sample Time	Pressure at TOC (psi)	Pressure in MP (psi)	Zone Pressure (psi)
CS-WB05-LGR-01	99	12/17/07	0946	14.23	14.34	25.47
CS-WB05-LGR-02	182		0945		14.36	30.04
CS-WB05-LGR-03A	216		0944		14.37	43.84
CS-WB05-LGR-03B	262		0943		25.99	63.79
CS-WB05-LGR-04A	277		0942		32.52	69.36
CS-WB05-LGR-04B	329		0941		55.16	91.60
CS-WB05-BS-01	362		0940		69.51	107.64
CS-WB05-CC-01	432		0939		99.89	135.70
CS-WB05-CC-02	460		0935		109.44	<del>155</del> 156.07
CS-WB06-UGR-01	20	12/17/07	1342	14.10	14.20	14.85
CS-WB06-LGR-01	93	1341	14.27		16.57	
CS-WB06-LGR-02	174	1340	14.28		31.92	
CS-WB06-LGR-03A	207	1339	14.30		48.39	
CS-WB06-LGR-03B	260	1338	23.80		71.29	
CS-WB06-LGR-04	320	1337	49.83		91.65	
CS-WB07-UGR-01	14	12/17/07	1424	14.16	14.22	15.49
CS-WB07-LGR-01	90	1423	14.23		19.97	
CS-WB07-LGR-02	175	1421	14.27		40.58	
CS-WB07-LGR-03A	208	1420	14.30		45.99	
CS-WB07-LGR-03B	267	1419	17.80		67.19	
CS-WB07-LGR-04	318	1417	44.30		88.37	
CS-WB08-UGR-01	38	12/17/07	1056	14.19	14.25	14.25
CS-WB08-LGR-01	115	1055	14.30		30.34	
CS-WB08-LGR-02	193	1054	14.34		33.48	
CS-WB08-LGR-03A	228	1053	14.36		44.33	
CS-WB08-LGR-03B	273	1052	21.17		63.79	
CS-WB08-LGR-04	341	1051	50.71		93.44	

probably wrong part



Personnel S. Elliott E. Ferrysen

Monthly Monitoring

MPLMVs	Sample Date	Sample Time	pH	Temp	SpCond	ORP	DO	Regulatory (Y)	Performance (Y)
CS-WB05-LGR-01									
CS-WB05-LGR-02									
CS-WB05-LGR03A									
CS-WB05-LGR03B	12/17/07	1015	7.68	18.31	0.583	-27.0	6.80		
CS-WB05-LGR04A									
CS-WB05-LGR04B									
CS-WB05-BS-01									
CS-WB05-CC-01									
CS-WB05-CC-02									
CS-WB06-UGR-01									
CS-WB06-LGR-01									
CS-WB06-LGR-02									
CS-WB06-LGR03A									
CS-WB06-LGR03B	12/17/07	1405	7.15	14.65	0.538	-21.8	6.74		
CS-WB06-LGR-04									
CS-WB07-UGR-01									
CS-WB07-LGR-01									
CS-WB07-LGR-02									
CS-WB07-LGR03A									
CS-WB07-LGR03B	12/17/07	1500	7.41	14.53	0.515	-44.0	6.20		
CS-WB07-LGR-04									
CS-WB08-UGR-01									
CS-WB08-LGR-01									
CS-WB08-LGR-02									
CS-WB08-LGR03A									
CS-WB08-LGR03B	12/17/07	1115	7.13	16.28	0.514	-7.9	7.58		
CS-WB08-LGR-04									

Notes: As part of monthly monitoring, Sumps 1-1, 1-2, 1-3, and uppermost saturated intervals of WB05 and WB-07 will be sampled for Performance list of analyses. Sumps in any trench that has been used during the previous 30 days will be sampled for Regulatory list of analyses. TDS has to be added to the list of analyses for Sumps 1-1, 1-2, and 1-3 if Trench 1 has been used in the previous 30 days.

Performance list of analyses Volume Required: 1.5 L	Regulatory list of analyses Volume Required: 0.5 L
VOCs (Volatile Organic Compounds)	VOCs (Volatile Organic Compounds)
DOC (Dissolved Organic Carbon)	TDS (Total Dissolved Solids)
TOC (Total Organic Carbon)	Notes
Methane, Ethane, Ethene	
Carbon Dioxide	
Hydrogen Sulfide	
Alkalinity	
Nitrogen, Nitrate + Nitrite	
Sulfate, Chloride, Ferrous Iron, Manganese	
Hydrogen (after bioreactor operational for 1 year)	

Month 8  
week 34

### Bioreactor Monitoring

Personnel: <i>J. B. Myron</i>											
Trench Sumps Water Levels ('BTOC)											
Sump ID	Sump Depth (ft BTOC)	Sump Water Level (ft BTOC)	pH	Temp (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (Y)	Notes		
Date: <i>12-27-07</i>		Time: <i>10:45</i>									
B3-T1-1	12.9	11.85	6.28	22.16	0.833	-152.8	0.58	✓	very stinky!		
B3-T1-2	12.4	11.40	6.26	22.77	0.935	-171.9	0.41				
B3-T1-3	12.85	11.10	6.28	22.35	0.879	-175.8	0.40				
B3-T2-1	9.67	dry									
B3-T2-2	10.01	9.77									
B3-T3-1	9.96	9.18									
B3-T3-2	7.4	dry									
B3-T4-1	6.32	dry									
B3-T5-1	9.33	dry									
B3-T5-2	7.98	7.97									
B3-T6-1	11.45	11.17									
B3-T6-2	12.34	12.03									
B3-UIC			7.02	21.18	0.509	-43.3	4.98				
B-3 Transfer System Monitoring											
Flow Meters Readings											
Meter	Monday	Tuesday	Wednesday	Thursday	Friday						
Date/Time:	<i>not run</i>	<i>not run</i>	<i>12-26-07 0941</i>	<i>12-27-07 0907 *</i>	<i>not run</i>						
	Rate (gpm) / Cumulative Total (gal)										
T-1			<i>13.71/32.39</i>	<i>4894.53</i>	<i>16.16/30.78</i>	<i>504,376</i>					
T-2											
T-3											
T-4											
T-5											
T-6											
B-3 (Total)			<i>4894.53</i>	<i>504,376</i>							
Bag Filter Pressure Reading (Pressure Drop (PB-1) - (PB-2) = *Note: If bag filter pressure drop is > or = 20 psi, change filter.											
PB-1 - PB-2 =			<i>27-23=4</i>	<i>31-21=10</i>							
Pressure Readings											
P-1					* lines frozen - must defrost in sunlight.						
P-2											
P-3											
P-4											
Notes:											

Week *35*  
month *8*

Personnel		Tommyson				
Weekly Water Level Monitoring						
Well Interval	Sampling Point Depth (ft BTOC)	Sample Date	Sample Time	Pressure at TOC (psi)	Pressure in MP (psi)	Zone Pressure (psi)
CS-WB05-LGR-01	99	12/27/07	1557	13.94	14.02	25.37
CS-WB05-LGR-02	182		1558		14.06	27.39
CS-WB05-LGR-03A	216		1558		14.08	39.18
CS-WB05-LGR-03B	262		1552		25.65	59.85
CS-WB05-LGR-04A	277		1553		32.17	64.88
CS-WB05-LGR-04B	329		1551		54.80	89.59
CS-WB05-BS-01	362		1549		69.14	103.60
CS-WB05-CC-01	432		1547		99.54	133.69
CS-WB05-CC-02	460		1545		111.68	145.82
CS-WB06-UGR-01	20		1501	13.97	13.99	14.22
CS-WB06-LGR-01	93		1459		14.03	16.39
CS-WB06-LGR-02	174		1457		14.06	29.80
CS-WB06-LGR-03A	207		1453		14.09	45.62
CS-WB06-LGR-03B	260		1453		23.55	68.52
CS-WB06-LGR-04	320		1450		49.59	88.73
CS-WB07-UGR-01	14		1435		13.95	13.99
CS-WB07-LGR-01	90		1433	14.02		19.61
CS-WB07-LGR-02	175		1431	14.07		39.27
CS-WB07-LGR-03A	208		1429	14.09		43.39
CS-WB07-LGR-03B	257		1427	17.54		64.59
CS-WB07-LGR-04	318		1424	44.03		85.49
CS-WB08-UGR-01	38		1526	13.96	13.98	13.98
CS-WB08-LGR-01	115		1525		14.01	29.93
CS-WB08-LGR-02	193		1523		14.07	31.10
CS-WB08-LGR-03A	228		1521		14.08	40.77
CS-WB08-LGR-03B	273		1518		20.88	60.22
CS-WB08-LGR-04	341		1515		50.41	90.18

13.95