



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

July 6, 2016

U-068-16

SUBJECT: Annual Status Report (Month 97 – Month 108, May 1, 2015 - April 30, 2016) of the Pilot Study Class V Aquifer Remediation Injection Wells at Camp Stanley Storage Activity, Boerne, Texas, TCEQ Authorization No. 5X2600431; WWC12002216; CN602728206/RN104431655

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

Dear Mr. Smith:

The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Material Command, U.S. Army, is submitting this annual 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 annual report contains data as specified by the Texas Commission on Environmental Quality (TCEQ) Underground Injection Control (UIC) permit for the months of May 2015 through April 2016 (Months 97-108). The annual reporting data includes quarterly 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. Data indicates that concentrations of contaminants did not exceed limits specified in 40 CFR §261.24 Table 1 as referenced in CSSA's UIC permit authorization.

Between May 1, 2015 and April 30, 2016 approximately 38,225,000 gallons of groundwater from wells CS-MW16-CC (~4,804,000 gallons), CS-MW16-LGR (~5,975,000 gallons), B3-EXW-01 (~5,993,000 gallons), B3-EXW-02 (~5,693,000), B3-EXW-03 (~5,208,000), B3-EXW-04 (~5,492,000), and B3-EXW-05 (~5,060,000) were injected into SWMU B-3 bioreactor trenches 1-6. A total of 153,283,500 gallons of recovered groundwater from CS-MW16-CC, CS-MW16-LGR, B3-EXW-01, B3-EXW-02, B3-EXW-03, B3-EXW-04, and B3-EXW-05 have been injected into these trenches since normal bioreactor operations began. Samples of the injected groundwater, for this reporting period, were collected on July 29 and October 21, 2015, and January 6 and April 20, 2016. Results of analysis are summarized in the attached Table 1. Field forms which contain operating pressures and pH readings for the reporting period are also attached and the laboratory data packages are included in the accompanying CD.

If you have any questions regarding the information contained in this letter, please feel free to contact Felicia Kraintz at (210) 295-7067 or Ken Rice, Parsons, at (512) 719-6050.

Sincerely,


Jason D. Shirley
Installation Manager

Enclosures

cc: Felicia Kraintz, CSSA Environmental Program Manager
Julie Burdey, Parsons (ltr only)
Ken Rice, Parsons
File: 745953.03100

Table 1
Analytical Summary Data

Table 1

B3-UIC Analytical Results
April 2015 - April 2016

	Sample ID		Sample Date		Sample Type		Sampling Method		Lab ID		B3-UIC		B3-UIC		B3-UIC		B3-UIC		B3-UIC		
	Lab MDL	Lab PQL	Lab Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria
SW8260B (µg/L)	0.07	1.2	--	--	04/13/15	07/29/15	10/21/15	01/06/16	04/20/16	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1
cis-DCE	0.08	0.6	--	--	Grab	Grab	Grab	Grab	Grab	AZ14525	AZ19496	AZ23340	AZ27195	AZ33497							
trans-DCE	0.05	1.0	500	500																	
TCE	0.06	1.4	700	700																	
PCE	0.06	1.1	--	--																	
Toluene	0.08	1.1	200	200																	
Vinyl chloride																					
EPA 160.1 (mg/L)	4.4	10	--	--																	
TDS																					
pH																					

Tables present all laboratory results for analytes.

Data packages for laboratory 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:

U - The analyte was analyzed for, but not detected. The associated numerical value is the MDL.

Abbreviations:

- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- N1 Environmental Sample
- UIC Underground Injection Control

Field Forms

Personnel: S. Elliott, J. Bouch (Week 415)

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 (X)	Notes
<i>Date: 04/13/15</i>									
<i>Time: 0700</i>									
B3-T1-1	15.95	7.47	6.67	22.21	1.368	-1.1	0.36		0900
B3-T1-2	15.52	7.11	6.86	22.73	1.159	51.9	0.44	✓	0920
B3-T1-3	14.97	6.21	6.78	22.99	1.361	-101.4	0.11		0950
B3-T2-1	11.78	7.91	6.75	20.63	2.259	-135.3	0.12		
B3-T2-2	11.12	7.21	6.65	22.90	1.554	-219.3	0.04		
B3-T3-1	11.05	8.59	6.55	18.86	1.922	-47.9	0.13		
B3-T3-2	7.4	Dry							
B3-T4-1	8.42	Dry							
B3-T5-1	11.55	9.29	6.53	22.14	1.464	-190.6	0.15		
B3-T5-2	11.04	10.01	6.65	22.48	3.963	-171.5	0.07		
B3-T6-1	14.63	10.20	6.98	21.88	1.277	-216.5	0.11	✓	1025
B3-T6-2	15.56	9.87	6.52	22.33	1.202	-176.5	0.16		1010
B3-UIC			7.00	21.39	1.173	543.1	5.37		Sample @ 0845

B-3 Transfer System Monitoring

Well ID	Date Time:	Flow Meters Readings							
		Monday	Tuesday	Wednesday	Thursday	Friday			
CS-MW16-CC	405	6.21	3,451,163	6.08	3,459,354	6.14	3,469,388	8.20	3,477,227
CS-MW16-LGR	302	9.89	9,945,255	9.67	9,958,205	9.84	9,974,129	9.76	9,986,608
B3-EXW01	338	7.88	3,198,184	40	3,208,580	40	3,221,403	40	3,231,445
B3-EXW02	333	8.78	3,102,565	0	3,106,495	0	3,106,495	0	3,106,495
B3-EXW03	320	15.06	5,107,068	19	5,152,478	19	5,177,734	19	5,177,734
B3-EXW04	330	0.00	2,655,471	0	2,665,330	0	2,682,697	42	2,691,695
B3-EXW05	364	0.00	3,895,140	0	3,901,533	20	3,913,139	0	3,919,136
Old Mainfield	T-1	14.0	7,692,148	14.3	7,715,603	14.9	7,734,209	14.3	7,757,554
	T-6	6.73	3,648,797	7.12	3,659,903	7.13	3,668,699	6.84	3,679,775
New Building	Meter In:	29.52	235,343	31.17	290,395	39.66	330,363	21.18	1,380,537
	Meter Out:	31.79	6,117,065	29.22	6,171,825	28.29	6,211,666	30.63	6,261,186
	Tank Levels:	6,000	6,000	6,000	6,000	5,500	5,500	5,700	5,500
	Bag Filter Pressure (In/Out):	6.5/5	5/5	5/5	4/8	7/7	7/7	5/5	3/8
Change BF	150 µ	75 µ	150 µ	75 µ	75 µ	150 µ	75 µ	150 µ	75 µ

Notes: Screen in meter on EXW02 if off again. Also high flow alarm keeps alarming- turned well off; notified R. Finke. Turned off EXW03 for the weekend.

Personnel: S. Elliott, J. Bouch (Week 432)

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: 07/31/2015 Time: 1015 - 1530									
B3-T1-1	15.95	6.54	6.79	25.10	0.876	-190.7	0.16		
B3-T1-2	15.52	6.40	6.79	23.91	0.937	-173.8	0.06	✓	
B3-T1-3	14.97	5.20	7.02	25.71	0.802	-144.6	0.08		
B3-T2-1	11.78	6.80	6.75	28.24	1.109	-146.1	0.13	✓	
B3-T2-2	11.12	6.24	6.62	24.60	1.151	-163.9	0.20		
B3-T3-1	11.05	7.47	6.81	25.18	1.238	-119.0	0.59		
B3-T3-2	7.4	Dry							
B3-T4-1	8.42	Dry							
B3-T5-1	11.55	6.85	7.35	23.05	0.570	-20.8	0.17		
B3-T5-2	11.04	8.03	6.63	27.49	1.343	-136.7	0.03		
B3-T6-1	14.63	9.52	7.05	23.40	0.622	-3.4	0.08		
B3-T6-2	15.56	9.28	6.79	23.36	0.600	-169.7	0.08	✓	
B3-UJC			7.09	25.98	0.631	196.2	4.11		Sample @ 1530

B-3 Transfer System Monitoring

Meter		Flow Meters Readings				
Well ID	Date/Time: Pump Depth (ft)	Monday	Tuesday	Wednesday	Thursday	Friday
Rate (gpm) / Cumulative Total (gall) / Well Head Pressure						
CS-MW16-CC	405	0.00	5,578,834	24.56	5,611,984	14.82
CS-MW16-LGR	302	15.94	1,553,752	14.92	1,575,988	24.37
B3-EXW01	338	22.70	5,363,629	0	5,424,115	0
B3-EXW02	333	25.08	1,742,089	0	1,788,048	26.16
B3-EXW03	320	Offline	5,956,579	0	5,956,579	Offline
B3-EXW04	330	0.00	4,530,513	0	4,539,343	0
B3-EXW05	364	0.00	4,939,405	0	4,962,038	19.23
Old Manifold						
T-1		Closed →				
New Building						
T-6		Closed →				
Meter In:		9,800,856	9,912,342	115.5	24,426	86.24
Meter Out:		5,673,180	5,783,404	109	5,896,056	70.14
Tank Levels:		3,700	4,700	4,000	4,000	5,500
Bag Filler Pressure (In/Out):		13/7	6/5	8/8	7/7	3/8
Change BF		150 μ	75 μ	150 μ	75 μ	150 μ

Notes:

Meter in flipped

150 μ

75 μ

75 μ

Personnel: B. Dietert, S. Elliott (Week 443)

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
<i>Date: 10/21/2015</i>									
<i>Time: 0945-1700</i>									
B3-T1-1	15.95	10.30	6.60	23.35	0.806	-261.6	0.07		1510
B3-T1-2	15.52	10.36	6.54	24.28	0.895	-248.6	0.10	✓	1335 (DNA, H+)
B3-T1-3	14.97	10.09	6.51	26.24	0.867	-261.9	0.30		1300
B3-T2-1	11.78	10.60	6.46	25.40	0.933	-266.7	0.11	✓	1530
B3-T2-2	11.12	10.09	6.54	27.10	1.078	-217.4	0.13		1445
B3-T3-1	11.05	10.17	6.62	26.93	0.868	-218.1	0.09		
B3-T3-2	7.4	7.30							
B3-T4-1	8.42	8.31							
B3-T5-1	11.55	9.79	6.48	23.02	0.811	-257.3	0.23		
B3-T5-2	11.04	10.35	6.47	23.88	1.138	-234.5	0.20		
B3-T6-1	14.63	10.17	6.88	22.76	0.631	11.1	1.57		1700
B3-T6-2	15.56	10.10	6.61	22.82	0.648	-273.5	0.08	✓	1605 (DNA, H+)
B3-UIC			7.00	22.49	0.640	10.0	4.59		Sample @ 0950

B-3 Transfer System Monitoring

Meter	Flow Meters Readings				
	Monday	Tuesday	Wednesday	Thursday	Friday
Date/Time:	10/19/15	10/20/15	1100	10/22/15	10/23/15
Pump Depth (ft)	1030			1300	1400
Well ID	Rate (gpm) / Cumulative Total (gall) / Well Head Pressure				
CS-MW16-CC	405	0.00	6,924.485	0.00	6,932.257
CS-MW16-LGR	302	12.98	2,689.611	12.11	2,739.363
B3-EXW01	338	0.00	6,059.079	0.00	6,072.229
B3-EXW02	333	0.00	3,000.097	0.00	3,017.473
B3-EXW03	320	0.00	7,431.241	0.00	7,469.646
B3-EXW04	330	0.00	5,289.526	0.00	5,295.660
B3-EXW05	364	Offline	6,213.576	0.00	6,217.461
T-1	Closed →				
T-6	Closed →				

Meter In:	New Building		Old Manifold	
	Value	Unit	Value	Unit
Meter In:	13.21		7.694.578	
Meter Out:	20.35		3,529.190	
Tank Levels:	4.800		4.800	
Bag Filter Pressure (In/Out):	2/6	5/5	2/6	5/5
Change BF	150 μ	75 μ	150 μ	75 μ

Notes: Bioreactor shutdown 0830-1530 for repairs to EXW05 influent line to #260

Personnel: B. Diertert, S. Elliott (Week 469)

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
<i>Date: 4/20/2016</i>									
<i>Time: 0830 - 1600</i>									
B3-T1-1	15.95	4.40	6.85	21.75	0.721	19.4	0.28		4/21/16 : 1155
B3-T1-2	15.52	4.06	6.86	21.92	0.711	-21.9	0.14	✓	4/21/16 : 1405 (DNA, H+)
B3-T1-3	14.97	2.85	6.89	21.58	0.762	-64.1	0.13		4/22/16 : 0830
B3-T2-1	11.78	4.80	6.75	22.10	0.898	72.6	0.16	✓	4/21/16 : 1105 (DNA, H+)
B3-T2-2	11.12	4.06	6.88	21.93	0.846	-135.1	0.29		4/21/16 : 1345
B3-T3-1	11.05	6.42	6.85	21.72	0.632	247.4	2.02	✓	4/21/16 : 1010 (DNA, H+)
B3-T3-2	7.4	4.92	6.52	22.35	0.762	158.1	0.17		4/20/16 : 1340
B3-T4-1	8.42	5.81	6.58	22.30	0.938	-90.2	0.24	✓	4/20/16 : 1015 (DNA, H+)
B3-T5-1	11.55	8.04	6.70	21.58	0.640	-10.2	0.21	✓	4/20/16 : 0915 (DNA, H+)
B3-T5-2	11.04	6.52	6.54	24.05	1.107	-66.7	0.07		4/19/16 : 1530
B3-T6-1	14.63	10.82	6.67	21.89	0.651	22.6	1.29		4/19/16 : 1505
B3-T6-2	15.56	10.53	6.41	21.90	0.797	-127.3	0.10	✓	4/20/16 : 1405 (DNA, H+)
B3-UIC			6.93	22.62	0.623	242.5	8.83		4/20/16 Sample @ 1405

B-3 Transfer System Monitoring

Well ID	Flow Meters Readings				
	Monday	Tuesday	Wednesday	Thursday	Friday
CS-MW16-CC	405				
CS-MW16-LGR	302				
B3-EXW01	338				
B3-EXW02	333				
B3-EXW03	313				
B3-EXW04	330				
B3-EXW05	364				
T-1	Closed →				
T-6	Closed →				
Meter In:	78.39	6,649,746			
Meter Out:	83.96	2,496,270			
Tank Levels:	4,000	4,000			
Bag Filler Pressure (In/Out):	30/20	10/15			
Change BF	150 μ	75 μ			
Notes: EXW03 meter out of service, well offline.					

Well ID	Rate (gpm) / Cumulative Total (gal) / Well Head Pressure				
	Monday	Tuesday	Wednesday	Thursday	Friday
CS-MW16-CC	0.00	14,893,711	0.00	14,895,294	12.73
CS-MW16-LGR	17.03	9,494,231	0.00	9,504,031	19.42
B3-EXW01	0.00	9,260,470	0.00	9,276,597	0
B3-EXW02	0.00	5,550,333	0.00	5,594,310	0
B3-EXW03	Offline	9,059,300	Offline	9,059,300	0
B3-EXW04	44.85	8,033,065	80	8,094,567	0
B3-EXW05	21.79	8,967,638	30	9,000,060	0
Old Manifold					
New Building					
Meter In:	78.39	6,649,746	0.00	6,813,453	60.94
Meter Out:	83.96	2,496,270	20.60	2,659,036	19.81
Tank Levels:	4,000	4,000	4,500	4,500	4,500
Bag Filler Pressure (In/Out):	30/20	10/15	2/7	5/4	4/10
Change BF	150 μ	75 μ	150 μ	75 μ	150 μ
Notes: EXW03 meter out of service, well offline.					

Shut down bioreactor @ 0910 to allow water to infiltrate in trenches in order to sample.

Bioreactor offline for sampling event. Bioreactor online @ 1300