



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

June 21, 2021

U-208-21

SUBJECT: Annual Status Report (Month 157 – Month 168, May 1, 2020 - April 30, 2021) of the Pilot Study Class V Aquifer Remediation Injection Wells at Camp Stanley Storage Activity, Boerne, Texas, TCEQ Authorization No. 5X2600431; WWC12002216; CN602728206/RN100662840

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 Corrective Measures to treat chlorinated compounds in groundwater via enhanced anaerobic biodegradation (EAB). Bioreactor activities include the injection of recovered groundwater into mulch/gravel filled bioreactor trenches and monitoring. Additional activities associated with this authorization include the emplacement of new mulch and gravel within bioreactor trenches 1, 2, and 6.

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 2020 through April 2021 (Months 157-168). The annual reporting data includes quarterly samples of the injected groundwater for volatile organic compounds (VOCs), total dissolved solids (TDS), and field-collected parameters including injection volumes, injection pressures and the pH of recovered groundwater. The data indicate 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, 2020 and April 30, 2021 approximately 12,558,000 gallons of groundwater from wells CS-MW16-CC (~3,100,000 gallons), CS-MW16-LGR (~419,000 gallons), B3-EXW-01 (~748,000 gallons), B3-EXW-02 (~1,287,000 gallons), B3-EXW-03 (~856,000 gallons), B3-EXW-04 (~3,576,000 gallons), and B3-EXW-05 (~2,572,000 gallons) were injected into operational SWMU B-3 bioreactor trenches 1, 2, and 6. A total of 259,689,000 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 trenches 1 through 6 since normal bioreactor operations began. Samples of the injected groundwater were collected during this reporting period on June 4, September 21, and December 9, 2020, and March 8, 2021. Analytical results are summarized in the attached Table 1. These samples are collected on the outflow side of the system holding tank prior to reinjection. Field forms containing operational pressures and pH readings for the reporting period are also attached. No substrate injections were performed within bioreactor trenches or injection wells associated with this Authorization (wells B3-MW01 through B3-MW04) during the reporting period.

Planned activities for the next reporting period, May 1, 2021 through April 30, 2022, include continued monthly, quarterly, and semi-annual monitoring. Additionally, the application of 11,000 lbs (four 275-gallon totes) of Wilclear Plus® sodium lactate within bioreactor trenches is anticipated. The application plan includes the injection of 1 tote of lactate in each of trenches 1, 2, and 6 and the remaining tote simultaneously applied within trenches 3, 4, and 5. This application of lactate is expected to take advantage of elevated water levels associated with Spring 2021 precipitation, thereby distributing the substrate laterally within the impacted Upper Glen Rose formation.

If you have any questions regarding the information contained in this letter, please feel free to contact me at (210) 295-7416 or Adrien Lindley, Parsons, at (512) 719-6052, adrien.lindley@parsons.com.

Sincerely,



T. Glenn Moore
Installation Manager

Enclosures

cc: Gabe Moreno-Fergusson, CSSA Environmental Program Manager
Greg Lyssy, USEPA Region 6
Julie Burdey, Parsons (ltr only)
Ken Rice, Parsons
File: 640149.0012.0105A

Table 1
Analytical Summary Data

Table 56.5.1

B3-UIC Analytical Results
March 2020 - March 2021

	Sample ID			B3-UIC			B3-UIC			B3-UIC			B3-UIC			B3-UIC			
	Sample Date			03/18/20			06/04/20			09/21/20			12/09/20			03/08/21			
	Sample Type			N1			N1			N1			N1			N1			
Sampling Method			Grab			Grab			Grab			Grab			Grab				
Lab ID			BA08976			BA12400			BA18795			BA22870			BA28550				
	Lab	Lab	B3-UIC	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	
	MDL	PQL	Criteria (RCRA Haz.)																
SW8260B (µg/L)																			
cis-DCE	0.07	1.2	—	71		1	80		1	77		1	63		1	23		1	
trans-DCE	0.08	0.6	—	0.08	U	1	0.08	U	1	1.1		1	0.08	U	1	2.6		1	
TCE	0.05	1.0	500	69		1	84		1	81		1	68		1	22		1	
PCE	0.06	1.4	700	54		1	59		1	68		1	46		1	18		1	
Toluene	0.06	1.1	—	0.06	U	1	0.06	U	1	0.06	U	1	0.06	U	1	0.06	U	1	
Vinyl chloride	0.08	1.1	200	0.08	U	1	0.08	U	1	0.08	U	1	0.08	U	1	0.08	U	1	
EPA 160.1 (mg/L)																			
TDS	4.4	10	—	302		1	318		1	466		1	384		1	382		1	

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 numeric

Abbreviations:

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

Field Forms

Personnel: Diectst / Elliott

Sump ID	Sump Depth (ft BTOC)	Sample Date	Sample Time	Water Level (ft BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (✓)	Notes
B3-T1-1	15.56	3/18/20	0930	6.31	6.34	22.12	0.954	-160.4	0.21		
B3-T1-2	15.52	3/14/20	0830	5.80	6.84	22.17	0.801	-134.2	0.52	✓	DNA/H+
B3-T1-3	14.97	3/18/20	0815	4.80	6.24	24.24	1.509	-86.1	0.36		
B3-T2-1	11.78	3/16/20	1015	6.47	7.04	20.51	0.708	-75.5	1.11	✓	DNA/H+
B3-T2-2	11.12	3/18/20	0845	5.77	6.09	22.99	0.913	-102.6	0.29		
B3-T3-1	11.05	3/18/20	-	8.19	6.10	19.10	1.147	46.6	1.09		DNA/H+
B3-T3-2	6.72	3/18/20	DRY	6.45	-	-	-	-	-		
B3-T4-1	8.42	3/18/20	Dry	8.40	-	-	-	-	-		DNA/H+
B3-T5-1	11.55		1005	9.74	6.34	22.08	0.837	-70.8	0.49		DNA/H+
B3-T5-2	11.04		DRY	10.95							
B3-T6-1	14.5		1030	10.42	6.58	22.23	0.629	-163.5	0.25	✓	
B3-T6-2	15.56	3/16/20	1110	9.70	6.95	22.26	0.614	-208.7	0.51		DNA/H+
B3-UIC		3/18/20	1045	NA	6.78	22.15	0.582	63.5	4.31		

Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes
CS-D	253	3/2/20	1045	-	7.04	21.07	0.493	144.9	8.43	
CS-MW1-LGR	302	3/2/20	1315	-	6.97	21.33	0.500	144.5	1.95	DNA/H+
CS-MW5-LGR	407	3/2/20	1130	-	7.03	21.32	0.499	156.4	8.41	

Personnel: Dietest, Elliott

Sump ID	Sump Depth (ft BTOC)	Sample Date	Sample Time	Water Level (ft BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used	Notes	
B3-T1-1	15.95	6/11/20		3.38	6.73	24.73	0.643	112.6	0.12			
B3-T1-2	15.52		3.32	6.49	24.46	0.784	-26.8	0.10		DNA/H+		
B3-T1-3	14.97		3.18	6.38	26.38	1.104	51.6	0.15				
B3-T2-1	11.78		3.72	6.77	22.81	0.648	132.2	0.48		DNA/H+		
B3-T2-2	11.12		2.91	6.50	24.93	0.754	-36.6	0.24				
B3-T3-1	11.05		6.30	6.49	24.12	1.045	166.5	0.14		DNA/H+		
B3-T3-2	7.4		4.58	6.84	26.26	0.633	45.1	0.29				
B3-T4-1	8.42		7.10	6.94	25.43	0.842	239.2	1.45		DNA/H+		
B3-T5-1	11.55		9.00	6.79	23.07	0.633	198.0	1.10		DNA/H+		
B3-T5-2	11.04		9.30	6.54	29.3	1.172	157.1	0.42				
B3-T6-1	14.63		9.41	6.83	23.50	0.741	243.9	0.29				
B3-T6-2	15.56		8.96	6.72	23.21	0.651	90.1	0.70		DNA/H+		
B3-UIC			6/4/20	1025		6.94	22.75	0.553	220.6	4.82		

Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes
B3-MW01	287									(15-month)
CS-D	253									
CS-MW1-LGR	302									
CS-MW5-LGR	407									

Westbay Zone	Sampling Port (ft BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	Pressure in MP (psi)	Zone Pressure
CS-WB05-LGR03B	262	6/11/20		14.24	22.15	37.29
CS-WB06-LGR03B	260		14.27	24.29	48.99	
CS-WB07-LGR03B	257		14.25	14.39	34.40	
CS-WB08-LGR03B	273		14.28	21.44	32.50	

(Profile Only)

Personnel: Elliott, Dietert

Sump ID	Sump Depth (ft BTOC)	Sample Date	Sample Time	Water Level (ft BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (N)	Notes
B3-T1-1	15.95	9/18/20	0820	7.05	6.66	24.27	0.677	-118.9	0.39		
B3-T1-2	15.52	9/14/20	1140	8.45	6.19	28.72	1.123	-200.7	0.21	✓	DNA/H+
B3-T1-3	14.97	9/18/20	0900	5.90	6.30	29.46	1.191	-41.6	0.33	✓	
B3-T2-1	11.78	9/14/20	1345	8.78	6.37	25.82	0.593	-213.7	0.11	✓	DNA/H+
B3-T2-2	11.12	9/18/20	0845	6.50	6.17	24.12	1.083	-70.3	0.70		
B3-T3-1	11.05	9/14/20		9.82	6.34	27.79	1.676	-174.9	0.32		DNA/H+
B3-T3-2	7.67	-	-	Dry	-	-	-	-	-		
B3-T4-1	8.42	-	-	Dry	-	-	-	-	-		DNA/H+
B3-T5-1	11.55	9/14/20		10.22	6.44	25.03	0.788	-164.9	0.28		DNA/H+
B3-T5-2	11.04	9/14/20		10.03	6.56	32.44	1.232	-161.8	0.53		
B3-T6-1	14.63	9/14/20	0800	9.41	6.72	23.09	0.593	54.8	1.36		
B3-T6-2	15.56	9/14/20	0940	10.03	6.22	23.95	0.692	-220.3	0.41	✓	DNA/H+
B3-UIC		9/21/20	0805	-	6.79	22.89	0.587	229.8	4.28		

Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes
CS-D	253	-	-	258'	=	-	-	-	-	WI below pump, 253'
CS-MW1-LGR	302	8/31/20	1310	-	7.11	22.34	0.567	98.3	9.36	DNA/H+
CS-MW5-LGR	407	9/3/20	0915	-	7.03	23.92	0.534	201.2	8.58	

Quarterly Sump Parameters

Personnel: Dietest

Sump ID	Sump Depth (ft BTOC)	Sample Date	Sample Time	Water Level (ft BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used	Notes	
B3-T1-1	15.95	12/23/20 ↓ 12/9/20	1004	10.55	6.25	19.07	0.645	-135.6	0.36			
B3-T1-2	15.52		0958	10.28	6.22	21.40	1.008	-76.4	1.22		DNA/H+	
B3-T1-3	14.97		0952	8.80	6.18	21.86	1.150	-64.0	0.96	✓		
B3-T2-1	11.78		0948	10.50	5.52	15.64	0.586	59.1	1.27		DNA/H+	
B3-T2-2	11.12		0944	10.10	6.11	20.67	1.021	-98.7	1.50	✓		
B3-T3-1	11.05		0939	Dry	-	-	-	-	-			DNA/H+
B3-T3-2	7.4		0935	Dry	-	-	-	-	-			
B3-T4-1	8.42		0930	Dry	-	-	-	-	-			DNA/H+
B3-T5-1	11.55		0925	11.31	6.44	23.85	0.538	-7.0	3.81			DNA/H+
B3-T5-2	11.04		0920	Dry	-	-	-	-	-			
B3-T6-1	14.63		0909	11.75	6.25	21.05	0.551	-25.4	1.68			
B3-T6-2	15.56		0915	11.28	5.93	21.32	0.767	-113.1	2.00	✓		DNA/H+
B3-UIC			12/9/20	1005		6.92	21.05	0.620	129.5	8.32		

Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes
B3-MW01	287									(15-month)
CS-D	253									
CS-MW1-LGR	302									
CS-MW5-LGR	407									

Westbay Zone	Sampling Port (ft BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	Pressure in MP (psi)	Zone Pressure
CS-WB05-LGR03B	262					
CS-WB06-LGR03B	260					
CS-WB07-LGR03B	257					
CS-WB08-LGR03B	273					

Semi-Annual Factor Sampling

Personnel: Dietest, Elliott

Sump ID	Sump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (✓)	Notes
B3-T1-1	15.95	3/8/21	0815	10.95	7.10	20.51	1.018	-193.0	0.58		
B3-T1-2	15.52	3/4/21	0930	12.01	6.30	20.50	1.052	24.2	1.13	✓	DNA
B3-T1-3	14.97	3/8/21	0815	10.95	6.18	20.44	1.435	-36.9	1.92	✓	
B3-T2-1	11.78	3/4/21	1015	10.85	6.71	16.74	0.870	-189.7	0.73	✓	DNA
B3-T2-2	11.12	3/8/21		DRY							
B3-T3-1	11.05			DRY							DNA
B3-T3-2	7.4			DRY							DNA
B3-T4-1	8.42			DRY							DNA
B3-T5-1	11.55			11.33							DNA
B3-T5-2	11.04			DRY							DNA
B3-T6-1	14.63		0900	11.78	7.56	21.01	0.787	45.4	6.57		
B3-T6-2	15.56	3/4/21	1115	11.17	6.52	20.64	0.920	-730	1.05	✓	DNA
B3-UIC		3/8/21	0915		7.19	20.37	0.782	45.3	6.78		

Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes
CS-D	253		NS	257.77	6.72	21.17	0.557	323.1	6.26	WL=257.77
CS-3	277.5	3/3/21	1415	-	6.72	21.17	0.557	323.1	6.26	
CS-MW1-LGR	302	3/4/21	0805		6.83	20.89	0.581	298.2	8.34	DNA
CS-MW5-LGR	407	3/3/21	1500	-	6.72	21.73	0.536	271.1	8.41	