



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

June 4, 2020

U-043-20

SUBJECT: Annual Status Report (Month 145 – Month 156, May 1, 2019 - April 30, 2020) 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 2019 through April 2020 (Months 145-156). 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. The 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, 2019 and April 30, 2020 approximately 19,557,000 gallons of groundwater from wells CS-MW16-CC (~2,183,000 gallons), CS-MW16-LGR (~1,246,000 gallons), B3-EXW-01 (~2,435,000 gallons), B3-EXW-02 (~1,803,000 gallons), B3-EXW-03 (~5,450,000 gallons), B3-EXW-04 (~1,958,000 gallons), and B3-EXW-05 (~4,482,000 gallons) were injected into operational SWMU B-3 bioreactor trenches 1, 2, and 6. A total of 246,906,000 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 3, September 18, and December 30, 2019, and March 18, 2020. 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 which contain 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.

In November 2019, 3,200 cubic yards of new deciduous tree mulch and 610 tons of gravel was added to bioreactor trenches 1, 2, and 6. To facilitate the addition of new mulch and gravel, these trenches were excavated, and old material stockpiled. The new mulch was emplaced within the open excavation and mixed in place with new gravel and the stockpiled material. Once complete, the distribution lines were reinstalled and covered with new geotextile fabric and a gravel cover.

Planned activities for the next reporting period, May 1, 2020 through April 30, 2021, include continued monthly, quarterly, and semi-annual monitoring.

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](mailto:adrien.lindley@parsons.com).

Sincerely,



Jason D. Shirley  
Installation Manager

Enclosures

cc: Margarita Loya, CSSA Environmental Program Manager  
Greg Lyssy, USEPA Region 6  
Julie Burdey, Parsons (ltr only)  
Ken Rice, Parsons  
File: 640149.110201.01005

Table 1  
Analytical Summary Data

Table 1

**B3-UIC Analytical Results**  
**March 2019 - March 2020**

	Sample ID Sample Date Sample Type Sampling Method Lab ID			B3-UIC 06/03/19 N1 Grab AZ92391			B3-UIC 09/18/19 N1 Grab AZ99779			B3-UIC 12/30/19 N1 Grab BA05377			B3-UIC 03/18/20 N1 Grab BA08976		
	Lab MDL	Lab PQL	B3-UIC Criteria (RCRA Haz.)	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution	Results	Flags	Dilution
<b>SW8260B (µg/L)</b>															
cis-DCE	0.07	1.2	--	26		1	75		1	88		1	71		1
trans-DCE	0.08	0.6	--	0.80		1	1.1		1	0.83		1	0.08	U	1
TCE	0.05	1.0	500	27		1	70		1	79		1	69		1
PCE	0.06	1.4	700	21		1	55		1	68		1	54		1
Toluene	0.06	1.1	--	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
<b>EPA 160.1 (mg/L)</b>															
TDS	4.4	10	--	400		1	363		1	345		1	302		1
<b>Field measured</b>															
pH				7.10			7.11			7.03			6.78		

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

**Abbreviations:**

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

## Field Forms

Quarterly  
Semi-Annual B      Sector Sampling

Personnel: 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	Notes		
B3-T1-1	15.95	7/8/19	0953	6.17	6.36	23.12	0.802	87.0	0.20	✓			
B3-T1-2	15.52		0940	6.07	6.33	23.98	0.849	-290.1	0.36				
B3-T1-3	14.97		0925	4.98	6.58	24.99	0.961	13.8	0.18				
B3-T2-1	11.78		1000	6.57	6.20	23.89	0.931	-35.9	0.15				
B3-T2-2	11.12		0946	6.05	6.55	24.83	0.927	-241.0	0.19				
B3-T3-1	11.05		1017	8.04	6.47	24.01	1.328	52.2	0.34				
B3-T3-2	7.4		1006	6.90	6.86	26.50	0.963	133.5	0.64				
B3-T4-1	8.42		1011	7.60	6.71	28.06	0.892	53.8	0.22				
B3-T5-1	11.55		1026	8.40	6.81	23.47	0.581	75.8	0.32				
B3-T5-2	11.04		1021	8.21	6.59	28.61	0.914	-188.1	0.21				
B3-T6-1	14.63		1037	6.65	6.60	23.05	0.658	-98.0	0.83				
B3-T6-2	15.56		1031	9.54	6.46	23.30	0.624	-216.3	0.13				
B3-UIC			N/A	1035	N/A	7.10	23.15	0.609	82.9		-		6/3/19

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									N/A
CS-MW1-LGR	302									N/A
CS-MW5-LGR	407									N/A

Westbay Zone	Sampling Port (ft BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	Pressure in MP (psi)	Zone Pressure
CS-WB05-LGR03B	262	6/10/19	N/A	14.24	24.74	71.44
CS-WB06-LGR03B	260	↓	↓	14.25	24.43	79.68
CS-WB07-LGR03B	257	↓	↓	14.26	14.43	75.52
CS-WB08-LGR03B	273	↓	↓	14.25	21.60	72.47

Semi-Annual Factor Sampling

Personnel: Elliott, Dieter

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	9/26/19	0845	7.76	6.48	23.27	0.738	199.1	1.28		
B3-T1-2	15.52	9/25/19	0920	7.67	6.67	24.17	0.713	-166.9	0.44	✓	DNA/H+
B3-T1-3	14.97	9/26/19	0940	7.02	6.66	26.87	0.842	-104.2	0.37		
B3-T2-1	11.78	9/26/19	1030	8.10	6.38	25.39	0.828	203.6	0.76		
B3-T2-2	11.12	9/26/19	0920	7.60	6.69	28.06	0.850	62.0	0.68	✓	
B3-T3-1	11.05	9/25/19	-	8.52	6.70	27.83	0.844	76.8	0.75		
B3-T3-2	7.4	9/25/19	-	Dry							
B3-T4-1	8.42	9/25/19	-	7.65	6.85	30.41	0.888	77.0	0.52		DNA/H+
B3-T5-1	11.55	9/25/19	-	8.31	6.66	23.96	0.621	133.0	0.43		DNA/H+
B3-T5-2	11.04	9/25/19	-	8.72	6.65	32.18	0.858	25.5	0.39		
B3-T6-1	14.63	9/26/19	0820	10.40	6.70	23.11	0.616	208.7	1.15	✓	
B3-T6-2	15.56	9/25/19	0820	10.05	6.72	23.29	0.642	317.4	0.21		
B3-UIC		9/18/19	1100		7.11	24.19	0.516	320.9	5.14		

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	9/5/19	0945	-	7.05	22.08	0.534	77.5	1.83	
CS-MW1-LGR	302	9/5/19	0830	-	6.95	21.62	0.546	104.9	8.40	
CS-MW5-LGR	407	9/5/19	1050	-	7.00	24.51	0.550	53.8	3.79	

Westbay Zone	Sampling Port (ft. BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	Pressure in MP (psi)	Zone Pressure
CS-WB05-LGR03B	262	9/12/19	0950	14.19	24.67	40.73
CS-WB06-LGR03B	260	9/23/19	0840	14.16	24.34	56.78
CS-WB07-LGR03B	257	9/12/19	1108	14.16	14.31	45.52
CS-WB08-LGR03B	273	9/23/19	1010	14.16	21.50	38.73

Semi-Annual Factor Sampling  
Quarterly

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	12/27/19	1051	6.65	6.55	21.20	1.215	-222.4	0.56		
B3-T1-2	15.52	↓	1057	6.45	6.45	22.27	1.264	-155.7	0.41	✓	
B3-T1-3	14.9754		1114	5.62	6.76	24.83	2.791	-162.4	0.53		
B3-T2-1	11.78		1043	7.13	6.59	21.91	0.927	-131.8	0.85	✓	
B3-T2-2	9.69112		1105	6.11	6.36	21.43	0.731	-140.4	0.43		
B3-T3-1	11.05		1035	8.66	6.62	21.89	1.565	50.0	1.69		
B3-T3-2	7.4		-	-	Dry	-	-	-	-		
B3-T4-1	8.42		1028	7.90	7.33	21.71	0.742	100.6	8.15		
B3-T5-1	11.55		1013	9.42	6.47	21.20	0.706	-155.7	0.58		
B3-T5-2	11.04		1020	10.14	6.67	27.41	0.968	38.7	3.65		
B3-T6-1	14.63		0955	10.35	6.67	21.26	0.641	-143.3	1.66		
B3-T6-2	15.56		1005	9.98	6.46	21.11	0.704	-162.4	0.77	✓	
B3-UIC			12/30/19	1425		7.03	20.77	0.590	217.1		8.51

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	12/4/19	0855	-	7.09	21.70	0.473	-	-	
CS-MW1-LGR	302	12/4/19	1423	-	7.01	21.56	0.471	-	-	
CS-MW5-LGR	407	12/5/19	0925	-	7.10	20.62	0.460	-	-	

Westbay Zone	Sampling Port (ft BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	Pressure in MP (psi)	Zone Pressure
CS-WB05-LGR03B	262	12/19/19	-	14.31	24.68	27.24
CS-WB06-LGR03B	260	12/23/19	-	14.22	24.33	47.12
CS-WB07-LGR03B	257	12/23/19	-	14.20	14.35	22.30
CS-WB08-LGR03B	273	12/30/19	-	14.22	21.46	16.55



## Semi-Annual Effluent Sampling

Personnel: Dietert / 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 <del>15.95</del>	3/18/20	0930	6.31	6.34	22.12	0.954	-160.4	0.21		
B3-T1-2	15.52	3/16/20	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	0.76		
B3-T2-1	11.78	3/16/20	1015	6.47	7.04	20.51	0.708	-175.5	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	<del>6.72</del>	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	1095							
B3-T6-1	14.5 <del>14.65</del>	✓	1030	10.42	6.58	22.23	0.629	-163.5	0.25	✓	DNA/H+
B3-T6-2	15.56	3/16/20	1110	9.70	6.95	22.26	0.614	-208.7	0.51		
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	