2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT CLASS 3 LANDFILL CROSS GENERATING STATION

by Santee Cooper
Moncks Corner, South Carolina

January 2020

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1. 40 CFR § 257.90 Applicability

1.1 40 CFR § 257.90(a)

All CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under § 257.90 through § 257.99.

The Class 3 Landfill at the Cross Generating Station (CGS) is subject to the groundwater monitoring and corrective action requirements set forth by the Environmental Protection Agency (EPA) in the Code of Federal Regulations Title 40 (40 CFR) § 257.90 through § 257.99. This document satisfies the requirement under § 257.90(e) which requires the CCR Landfill Owner/Operator to prepare an Annual Report.

1.2 40 CFR § 257.90(e) - SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1).

This Annual Report documents the activities completed in 2019 for the Class 3 Landfill at CGS as required by the Groundwater Monitoring and Corrective Action regulations. Groundwater sampling and analysis was conducted per the requirements of § 257.93, and the status of the groundwater monitoring program, set forth in § 257.95, is provided in this report.

1.2.1 Status of the Groundwater Monitoring and Corrective Action Program

Statistically significant increases (SSI) of Appendix III constituents were identified downgradient of the Class 3 Landfill, and the notification was provided on January 15, 2018. An evaluation of alternate sources was conducted and a successful alternative source demonstration (ASD) was completed in April 2018. The ASD concluded that the closed Class 2 Landfill, located immediately upgradient of the Class 3 Landfill, was responsible for the Appendix III SSIs. The successful ASD, certified by a qualified Professional Engineer, remains valid based on the results of the 2019 statistical analysis. As a result, the Unit remained in the Detection Monitoring program as required by § 257.94(e)(2).

1.2.2 Key Actions Completed

The following key actions were completed in 2019:

- Conducted statistical analysis of detection monitoring results to evaluate potential SSIs. This statistical analysis, completed in January 2020, identified statistically significant increases of boron, calcium, chloride pH, sulfate, and total dissolved solids (TDS) above background downgradient of the Class 3 Landfill. Results are consistent with 2018 and the ASD remains in effect. Output from the statistical analysis is summarized in Appendix A attached;
- Prepared 2018 Annual Report including:
    - The Annual Report was placed in the facility's operating record pursuant to § 257.105(h)(1);
    - Pursuant to § 257.106(h)(1), the notification was sent to the relevant State Director within 30 days of the Annual Report being placed in the facility's operating record [§ 257.106(d)];
    - Pursuant to § 257.107(h)(1), the Annual Report was posted to the CCR Website within 30 days of the Annual Report being placed in the facility's operating record [§ 257.107(d)];

1.2.3 Problems Encountered

Problems such as damaged wells or issues with sample collection or lack of sampling were not encountered at the Class 3 Landfill in 2019.

1.2.4 Actions to Resolve Problems

No problems needed resolution.

1.2.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2020 include the following:

- Conduct semi-annual groundwater monitoring and subsequent statistical analysis as required by § 257.94 or § 257.95.
- Review of the ASD for the Class 3 Landfill to verify on-going validity, which include a reviews of the analytical data and statistical analysis of Detection Monitoring analytical data to determine if statistically significant increases (SSIs) of the Appendix III constituents are present;
- Prepare the 2020 annual report; place it in the record as required by § 257.105(h)(1), notify the state [§ 257.106(d)]; and post to website [§ 257.107(d)].

1.3 40 CFR § 257.90(e) - INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

1.3.1 40 CFR § 257.90(e)(1)

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the Bottom Ash Pond is presented as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Plan, which was placed in the facility's operating record by October 17, 2017 as required by § 257.105(h)(2).

1.3.2 40 CFR § 257.90(e)(2)

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

Additional monitoring wells were not installed or decommissioned during 2019.

1.3.3 40 CFR § 257.90(e)(3)

In addition to all the monitoring data obtained under § 257.90 through § 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

In accordance with § 257.95(b) and § 257.95(d)(1), at least two independent samples from each background and downgradient monitoring well were collected and analyzed. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the Class3 Landfill is presented in Table 1 of this report. In addition, as required by § 257.95(d)(3), Table 1 includes the groundwater protection standards established under § 257.95(d)(2).

1.3.4 40 CFR § 257.90(e)(4)

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

As required by § 257.93(h) a statistical analysis for Appendix III SSIs was completed by January 15, 2018. Baseline analytical data collected from background monitoring wells were combined to develop Upper Tolerance Limits (UTLs). The UTLs for each Appendix III constituent were compared to the analytical results for the downgradient monitoring wells. Constituents with analytical results exceeding the UTLs were identified as SSIs over background for the respective Appendix III constituent. This analysis indicated that statistically significant increases of boron, calcium, chloride, pH, sulfate, and total dissolved were present downgradient of the Class 3 Landfill. Due to the successful ASD completed in April 2018, the Class 3 Landfill remained in Detection Monitoring in 2019. The sample concentrations at the downgradient wells for each of the Appendix III constituents from the 2019 detection monitoring sampling events were compared to their respective UTLs. A sample concentration greater than the UTL is considered to represent an SSI. Based on these comparisons and relying on an intrawell evaluation, a SSI for chloride in wells CLF-3 and CLF-4 was indicated (Appendix A). This finding is consistent with previous evaluations described in the ASD. As a result, the ASD for the Class 3 Landfill continues to address this finding and remains in detection monitoring.

1.3.5 40 CFR § 257.90(e)(5)

Other information required to be included in the annual report as specified in § 257.90 through § 257.98.

Since the Class 3 Landfill remained in Detection Monitoring in 2019, no other information was required to be included in this annual report.

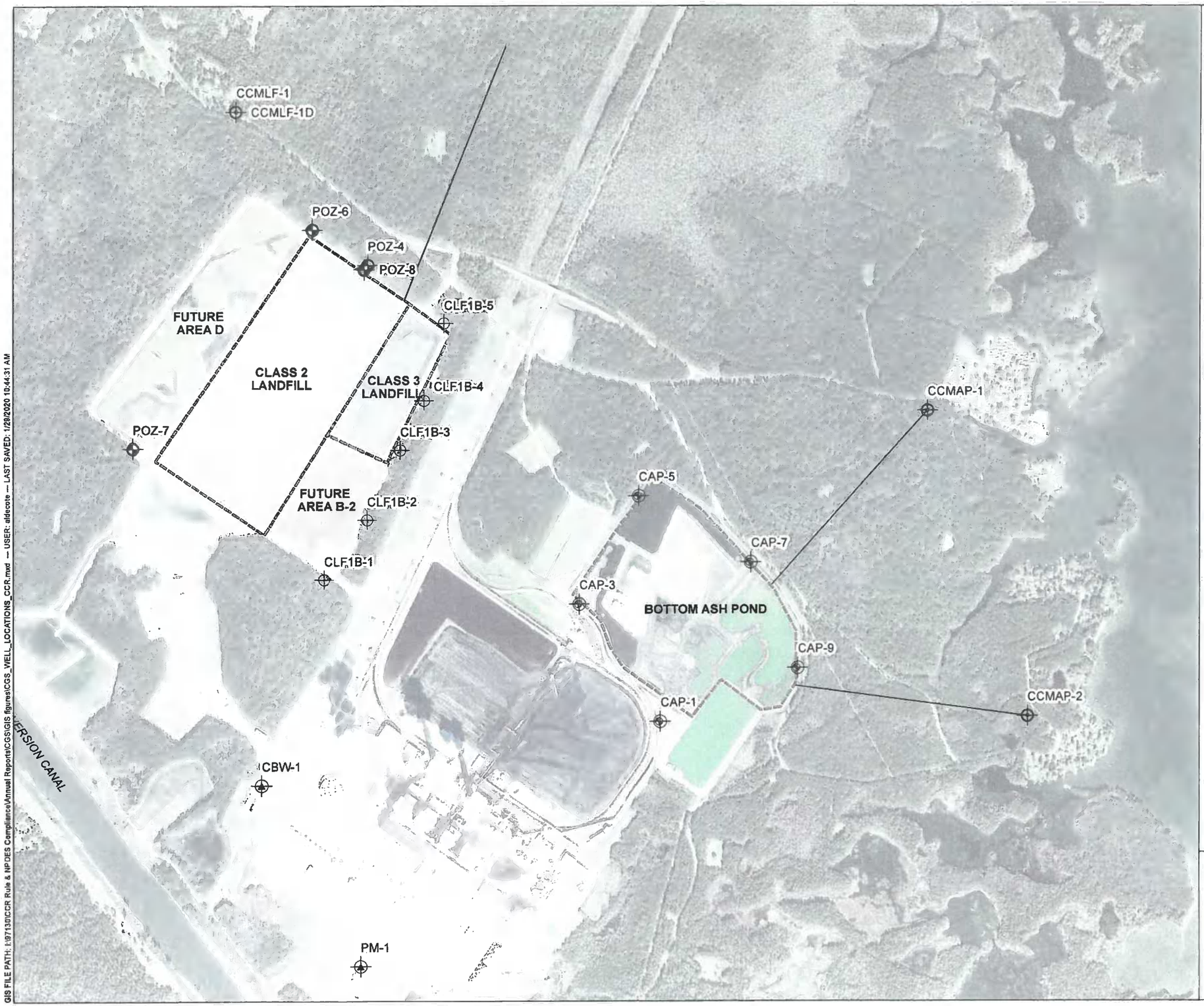
TABLES

TABLE 1 - Summary of Analytical Results
Cross Generating Station Class 3 Landfill Detection Monitoring

Well ID	Purpose	Date of Sample Event		Appendix III Constituents							Field Parameters							
				Boron	Calcium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Depth to Groundwater	Groundwater Elevation	pH	Specific Conductivity	Temperature	Oxidation Reduction Potential	Turbidity	Dissolved Oxygen
			Unit	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	SU	Feet (btoc)	Feet (msl)	SU	uS	C	mv	NTU	ppm
			Method	EPA 6020B	EPA 6020B	EPA 300.0	EPA 300.0	EPA 300.0	SM 2540C							SM2580		
			GWPS/US EPA MCL/RSL	----	----	----	4	----	----	----	----	----	----	----	----	----	----	----
Site Background Wells																		
PM-1	Background	2/12/2019			15.9	12.1	<0.10	8.96	136.2	5.47	7.32	75.92	5.47	191	17.02	78	9.4	0.92
PM-1	Background	5/20/2019			16.4	12.7		10.5	162.5	5.26	8.52	74.72	5.26	187	25.6	39	0	0.77
PM-1	Background	7/8/2019		<15	6	14.2	<0.10	4.2	90	4.47	7.58	75.66	4.47	96	24.24	61	0	0.42
PM-1	**total samples**			**1**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
CBW-1	Background	2/12/2019		<15	24.4	2.68	0.18	69.1	135	4.5	8.66	77.14	4.5	202	18.04	111	0.5	0.99
CBW-1	Background	5/20/2019			42.2	2.9		115	181.2	4.65	10.69	75.11	4.65	268	27.25	31	9.6	0.67
CBW-1	Background	7/8/2019		22	26	3.13	0.2	76.3	117.5	4.19	10.08	75.72	4.19	209	20.62	126	0.2	0.54
CBW-1	**total samples**			**2**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Class 3 Landfill Wells																		
CLF1B-1	Detection	2/12/2019		<15	176	36.3	<0.10	139	617.5	6.82	6.27	77.49	6.82	946	17.62	118	0	1.22
CLF1B-1	Duplicate	2/12/2019		<15	181	36.8	<0.10	137	617.5									
CLF1B-1	Detection	7/8/2019		<15	168	40.6	<0.10	144	580	6.47	8.15	75.61	6.47	888	20.61	73	0	0.43
CLF1B-1	Duplicate	7/8/2019		<15	190	38	<0.10	144	602.5									
CLF1B-1	**total samples**			**4**	**4**	**4**	**4**	**4**	**4**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
CLF1B-2	Detection	2/12/2019		16	152	80.1	<0.10	13.5	476.2	7.07	4.63	77.41	7.07	720	19.87	44	0	0.82
CLF1B-2	Detection	7/8/2019		17	130	39.6	<0.10	12.5	545	6.61	6.52	75.52	6.61	734	22.09	-5	0	0.46
CLF1B-2	**total samples**			**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
CLF1B-3	Detection	2/12/2019		44	198	29	<0.10	191	651.2	6.82	5.44	77.31	6.82	975	20	19	0	0.76
CLF1B-3	Detection	7/8/2019		40	217	81.2	<0.10	13	755	6.53	7.31	75.44	6.53	1080	22.27	-54	0	0.37
CLF1B-3	**total samples**			**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
CLF1B-4	Detection	2/12/2019		18	110	54.4	<0.10	13.7	331.2	7.38	5.38	77.36	7.38	507	23.25	37	0	1.8
CLF1B-4	Detection	7/8/2019		19	102	66.5	<0.10	13.9	427.5	6.93	7.51	75.23	6.93	589	20.95	13	0	0.35
CLF1B-4	**total samples**			**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
CLF1B-5	Detection	2/13/2019		18	257	134	<0.10	203	921.2	6.71	3.87	77.22	6.71	1370	15.86	36	1.8	0.67
CLF1B-5	Detection	7/9/2019		19	256	151	<0.10	236	1155	6.5	6.07	75.02	6.5	1350	22.5	-29	0	0.44
CLF1B-5	**total samples**			**2**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

All groundwater samples collected from the monitoring wells for Assessment Monitoring in 2019 for the constituents listed in Appendix III and Appendix IV of the EPA CCR Rule (40 CFR) were analyzed by South Carolina Certified laboratories: Santee Cooper Analytical Services (Certification # 08552), GEL Laboratories, LLC (Certification # 10120), Test America Laboratories Inc. Savannah (Certification # 98001), Test America Laboratories Inc. Pensacola (Certification #96026), Rogers & Callcot, Inc. (Certification # 23105001), and Pace Analytical Services LLC (Certification #99030).

FIGURES



LEGEND

- BACKGROUND WELL
- PROPERTY BOUNDARY WELL
- ASH POND WELL
- CLASS 3 LANDFILL AREA B WELL
- CLASS 2 LANDFILL WELL
- CCR BOUNDARY
- TRANSECT

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 1,100 2,200
SCALE IN FEET

SANTEE COOPER
CROSS GENERATING STATION
CROSS, SOUTH CAROLINA

LOCATION OF GROUNDWATER MONITORING WELLS FOR CCR COMPLIANCE - 2019

JANUARY 2020

FIGURE 1

GIS FILE PATH: I:\97130\CCR Rule & NPDES Compliance\Annual Reports\CGS\GIS figures\CGS_WELL_LOCATIONS_CCR.mxd — USER: aldecote — LAST SAVED: 1/29/2020 10:44:31 AM

Appendix A – Statistical Analysis

HALEY & ALDRICH, INC.
400 Augusta Street
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Greenville, SC 29601
864.214.8750

TECHNICAL MEMORANDUM

January 30, 2020
File No. 131539-003

SUBJECT: Summary of Appendix III Groundwater Monitoring Results Pursuant to 40 CFR § 257.93 and 40 CFR § 257.94
Cross Generating Station
Class 3 Landfill

The South Carolina Public Service Authority (Santee Cooper) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR § 257 and 261) for the Cross Generating Station, located in Berkeley County, South Carolina. Santee Cooper provided Haley & Aldrich with groundwater monitoring data collected from a groundwater monitoring system that meets the requirements of 40 CFR §257.91. This memorandum documents the results of statistical tests conducted to determine if Appendix III groundwater monitoring constituents detected in downgradient wells are at levels that exhibit a statistically significant increase (SSI) above background or upgradient wells consistent with the requirements in 40 CFR § 257.94.

Following baseline sampling the initial statistical analysis completed in January 2018 identified SSI's for one or more Appendix III constituent downgradient of the Class 3 Landfill. However, recognizing that the new Class 3 Landfill was constructed along the downgradient flank of the closed Class 2 Landfill, and had not received CCR prior to completing detection monitoring, Haley & Aldrich conducted an evaluation to demonstrate that a source other than the Class 3 Landfill caused the statistically significant increase over background, consistent with §257.94(e)(2).

This certified alternate source demonstration (ASD) concluded that the closed Class 2 Landfill is the source for the Appendix III SSIs detected downgradient of the two units, and as a result, the new Class 3 Landfill remained in detection monitoring, and an intrawell evaluation was conducted for the Appendix III constituents. The intrawell evaluation compares the most recent values from each compliance well against a background dataset composed of its own historical data. Two rounds of detection monitoring results were obtained in 2019, as required. The Upper Tolerance Limit (UTL) statistical analysis was used to perform the statistical evaluation. The UTL is an accepted method under the CCR Rule and is the upper endpoint of a tolerance interval that is designed to contain a pre-specified proportion (e.g. 95 percent) of the background dataset.

Statistical Evaluation of Appendix III Constituents

The Rule, 40 CFR §257.93(f) (1-4), provides four specific options to statistically evaluate whether water quality downgradient of the CCR Unit represents an SSI of Appendix III parameters compared to background water quality of the CCR Unit. The Upper Tolerance Limit (UTL) was used to evaluate

potential SSIs. A 95% Upper Tolerance Limit for 99% coverage was calculated to compare to downgradient groundwater analytical results for this evaluation.

UTL STATISTICAL ANALYSIS

The UTL is an accepted statistical method identified in the CCR Rule to evaluate the groundwater analytical data at CCR Units. A tolerance interval is a concentration range, with some confidence level, designed to contain a pre-specified proportion (e.g., 99 percent) of the underlying population from which the statistical sample is drawn (background). The upper endpoint of a tolerance interval is called the upper tolerance limit or UTL. Depending on the assumed distribution of background, parametric or non-parametric procedures were used to develop the UTL. Parametric tolerance limits utilize assumed distributions of the sample background data to develop the UTL, and non-parametric limits utilize order statistics or bootstrap methods to develop the UTL. The UTL was calculated using the U.S. EPA's ProUCL 5.1 software from the background well data after testing for outlier sample results that would warrant removal from the data set based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using ProUCL, and a visual inspection of the data was performed for the downgradient sample data. With the exception of chloride at all of the downgradient wells, no sample data were deemed as outliers that warranted removal from the data set.

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations at the downgradient wells for each of the Appendix III constituents from the 2019 detection monitoring sampling events were compared to their respective UTLs. A sample concentration greater than the UTL is considered to represent a SSI. Based on these comparisons and relying on an intrawell evaluation, a SSI for chloride in wells CLF-3 and CLF-4 was indicated. This finding is consistent with previous evaluations and the increasing concentration trend for chloride described in the ASD. As a result, the ASD for the Class 3 Landfill continues to address this finding.

Tables:

Table I – Summary of Detection Monitoring Statistical Evaluation – February 2019
Table II – Summary of Detection Monitoring Statistical Evaluation – July 2019

TABLES

Cross Class 3 Landfill

Detection Monitoring Statistical Analysis Summary

Prepared: May 31, 2019

																				Preliminary Inter-well Analysis		Preliminary Intra-well Analysis	
Location Id	Frequency of Detection	Percent Non-Detects	Range of Non-Detect	Mean	50th Percentile (Median)	95th Percentile	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Presence	Outlier Removed	Trend	Distribution Group	Distribution Well*	February 2019 Concentration (mg/L)	Background Limit (Upper Prediction Limit)	SSI	Background Limit (Upper Prediction Limit)	SSI
CCR Appendix-III: Boron, Total (mg/L)																									
PM-1	8/13	38%	0.015-0.015	0.0165	0.016	0.0198	0.021	0.000003686	0.00192	0.1163	NA	mg/L	N	0	0										
CBW-1	13/14	7%	0.015-0.015	0.0224	0.0219	0.03083	0.032	0.000022	0.00469	0.2092	NA	mg/L	N	0	0							0.03			
CLF1B-1	2/13	85%	0.015-0.015	0.0151	0.015	0.0154	0.016	7.692E-08	0.0002774	0.0184	NA	mg/L	N	0	0									0.016	
CLF1B-2	11/13	15%	0.015-0.015	0.0183	0.016	0.02792	0.0398	0.00004378	0.006617	0.3607	NA	mg/L	N	0	0									0.040	
CLF1B-3	13/13	0%	-	0.0357	0.031	0.0556	0.064	0.0002039	0.01428	0.3999	NA	mg/L	N	0	0								Y	0.083	
CLF1B-4	13/13	0%	-	0.0205	0.02	0.028	0.0292	0.00001449	0.003806	0.186	NA	mg/L	N	0	0									0.039	
CLF1B-5	9/13	31%	0.015-0.015	0.0158	0.0153	0.0184	0.019	0.000001611	0.001269	0.08026	NA	mg/L	N	0	0									0.016	Y
CCR Appendix-III: Calcium, Total (mg/L)																									
PM-1	14/14	0%	-	19.2	16.8	30.5	37	48.36	6.954	0.3613	NA	mg/L	N	0	0							42.17			
CBW-1	13/13	0%	-	25.1	24.4	28.98	29.4	5.767	2.401	0.09559	NA	mg/L	N	0	0										
CLF1B-1	12/12	0%	-	178	178	189.9	191	60.63	7.786	0.04376	NA	mg/L	N	0	0								Y	216.79	
CLF1B-2	12/12	0%	-	138	130.5	178.1	210	594.5	24.38	0.1769	NA	mg/L	N	0	0								Y	210.00	
CLF1B-3	11/11	0%	-	167	177	213.5	220	1647	40.58	0.2435	NA	mg/L	N	0	0								Y	322.48	
CLF1B-4	12/12	0%	-	101	92.75	141.5	180	745.5	27.3	0.2716	NA	mg/L	N	0	0								Y	180.00	
CLF1B-5	12/12	0%	-	214	212.5	266.9	279	1314	36.25	0.1694	NA	mg/L	N	0	0								Y	307.49	
CCR Appendix-III: Chloride (mg/L)																									
PM-1	14/14	0%	-	12.7	12.7	13.44	13.5	0.3765	0.6136	0.04851	NA	mg/L	N	0	0							13.50			
CBW-1	14/14	0%	-	2.78	2.805	3.073	3.21	0.06249	0.25	0.0898	NA	mg/L	N	0	0										
CLF1B-1	13/13	0%	-	38.3	38.9	41.2	41.5	4.93	2.22	0.05794	NA	mg/L	N	0	0								Y	47.83	
CLF1B-2	13/13	0%	-	71.7	70.9	78.84	80.1	27.61	5.255	0.07325	NA	mg/L	N	0	0								Y	88.04	
CLF1B-3	13/13	0%	-	24.6	23	31.08	34.2	13.25	3.64	0.1481	NA	mg/L	N	0	0								Y	26.80	Y
CLF1B-4	13/13	0%	-	51.1	50.9	55.04	56	6.363	2.523	0.04938	NA	mg/L	N	0	0								Y	61.49	
CLF1B-5	13/13	0%	-	110	114	125.6	134	251.8	15.87	0.1443	NA	mg/L	N	0	0								Y	118.00	Y
CCR Appendix-III: Fluoride (mg/L)																									
PM-1	0/13	100%	0.1-0.1	0.1	0.1	0.1		4.626E-18	2.151E-09	2.151E-08	4	mg/L	N	0	0							0.30			
CBW-1	13/13	0%	-	0.236	0.23	0.294	0.3	0.001642	0.04053	0.1716	4	mg/L	N	0	0										
CLF1B-1	9/12	25%	0.1-0.1	0.131	0.125	0.179	0.19	0.0007902	0.02811	0.2149	4	mg/L	N	0	0									0.23	
CLF1B-2	6/12	50%	0.1-0.1	0.114	0.105	0.149	0.16	0.0003902	0.01975	0.173	4	mg/L	N	0	0									0.21	
CLF1B-3	8/12	33%	0.1-0.1	0.123	0.12	0.15	0.15	0.0004023	0.02006	0.1637	4	mg/L	N	0	0									0.17	
CLF1B-4	3/12	75%	0.1-0.1	0.105	0.1	0.1245	0.13	0.0001	0.01	0.09524	4	mg/L	N	0	0									0.13	
CLF1B-5	3/12	75%	0.1-0.1	0.107	0.1	0.1335	0.15	0.0002242	0.01497	0.1404	4	mg/L	N	0	0									0.11	
CCR Appendix-III: pH, Field (pH units)																									
PM-1	15/15	0%	-	5.24	5.2	5.503	5.58	0.02793	0.1671	0.0319	NA	pH units	N	0	0							4.09, 5.58			
CBW-1	14/14	0%	-	4.29	4.32	4.468	4.5	0.01532	0.1238	0.02882	NA	pH units	N	0	0										
CLF1B-1	13/13	0%	-	6.59	6.6	6.736	6.82	0.01472	0.1213	0.01841	NA	pH units	N	0	0								Y	6.22, 6.96	
CLF1B-2	13/13	0%	-	6.93	6.91	7.084	7.09	0.01016	0.1008	0.01455	NA	pH units	N	0	0								Y	6.53, 7.3	
CLF1B-3	13/13	0%	-	6.72	6.73	6.868	6.94	0.01176	0.1084	0.01613	NA	pH units	N	0	0								Y	6.14, 7.31	
CLF1B-4	13/13	0%	-	7.18	7.2	7.374	7.38	0.01547	0.1244	0.01732	NA	pH units	N	0	0								Y	6.62, 7.73	
CLF1B-5	13/13	0%	-	6.69	6.71	6.788	6.83	0.007131	0.08444	0.01262	NA	pH units	N	0	0								Y	6.21, 7.16	
CCR Appendix-III: Sulfate (mg/L)																									
PM-1	14/14	0%	-	14.1	11.5	25.85	26.5	41.16	6.415	0.4562	NA	mg/L	N	0	0							90.10			
CBW-1	14/14	0%	-	76	74.1	88.86	90.1	60.8	7.797	0.1025	NA	mg/L	N	0	0										
CLF1B-1	13/13	0%	-	139	136	153	153	87	9.327	0.0671	NA	mg/L	N	0	0								Y	184.99	
CLF1B-2	13/13	0%	-	14.8	13.3	20.72	22.4	9.569	3.093	0.2093	NA	mg/L	N	0	0									22.40	
CLF1B-3	13/13	0%	-	142	159	212.2	226	3422	58.5	0.4112	NA	mg/L	N	0	0								Y	382.82	
CLF1B-4	13/13	0%	-	18.3	15.3	32.38	34.3	46.84	6.844	0.3745	NA	mg/L	N	0	0									34.30	
CLF1B-5	13/13	0%	-	133	130	233	278	4924	70.17	0.5268	NA	mg/L	N	0	0								Y	311.12	
CCR Appendix-III: Total Dissolved Solids (TDS) (mg/L)																									
PM-1	13/14	7%	40-40	130	130	202.1	206	2602	51.01	0.3912	NA	mg/L	N	0	0							266.86			
CBW-1	13/14	7%	40-40	115	120	150.6	151.7	1116	33.41	0.2916	NA	mg/L	N	0	0										
CLF1B-1	13/13	0%	-	591	594	649.8	651.7	1653	40.66	0.0688	NA	mg/L	N	0	0								Y	770.20	
CLF1B-2	13/13	0%	-	463	472	528.6	535	2643	51.41	0.1111	NA	mg/L	N	0	0								Y	653.42	
CLF1B-3	13/13	0%	-	896	542.9	2554	5355	1813000	1346	1.503	NA	mg/L	N	0	0								Y	5355.00	
CLF1B-4	13/13	0%	-	343	350	411.2	434	2781	52.73	0.1535	NA	mg/L	N	0	0								Y	532.69	
CLF1B-5	13/13	0%	-	803	776.7	992.1	1076	17820	133.5	0.1664	NA	mg/L	N	0	0								Y	1172.64	

Cross Class 3 Landfill

Detection Monitoring Statistical Analysis Summary

Prepared: January 29, 2020

															Background Data						Inter-well Analysis		Intra-well Analysis		
Location Id	Frequency of Detection	Percent Non-Detects	Range of Non-Detect	Mean	50th Percentile (Median)	95th Percentile	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Present	Outlier Removed	Trend	Distribution Group	Distribution Well*	July 2019 Concentration (mg/L)	Background Limit (Upper Prediction Limit)	SSI	Background Limit (Upper Prediction Limit)	Background Limit (Upper Prediction Limit) ug/L	SSI
CCR Appendix-III: Boron, Total (mg/L)																										
PM-1	8/13	38%	0.015-0.015	0.0165	0.016	0.0198	0.021	0.000003686	0.00192	0.1163	NA	mg/L	N	0	0							0.032				
CBW-1	13/14	7%	0.015-0.015	0.0224	0.0219	0.03083	0.032	0.000022	0.00469	0.2092	NA	mg/L	N	0	0											
CLF1B-1	1/14	86%	0.015-0.015	0.0151	0.015	0.01535	0.016	7.143E-08	0.0002673	0.01773	NA	mg/L	N	0	0									0.016	16	
CLF1B-2	12/14	14%	0.015-0.015	0.0183	0.0161	0.02693	0.0398	0.00004055	0.006368	0.3489	NA	mg/L	N	0	0									0.040	39.8	
CLF1B-3	14/14	0%	--	0.036	0.0355	0.0549	0.064	0.0001896	0.01377	0.3823	NA	mg/L	N	0	0								Y	0.089	89.0801	
CLF1B-4	14/14	0%	-	0.0204	0.0195	0.0279	0.0292	0.00001353	0.003678	0.1806	NA	mg/L	N	0	0									0.035	34.6954	
CLF1B-5	10/14	29%	0.015-0.015	0.016	0.0154	0.019	0.019	0.000002212	0.001487	0.0927	NA	mg/L	N	0	0									0.019	19	
CCR Appendix-III: Calcium, Total (mg/L)																										
PM-1	15/15	0%	-	19.1	16.6	30	37	45.45	6.742	0.3537	NA	mg/L	N	0	0							42.17				
CBW-1	14/14	0%	-	26.3	25	33.88	42.2	26.15	5.114	0.1941	NA	mg/L	N	0	0											
CLF1B-1	13/13	0%	-	177	176	189.8	191	63.14	7.946	0.04485	NA	mg/L	N	0	0								Y	207.74	207742	
CLF1B-2	13/13	0%	-	137	130	175.2	210	549.7	23.45	0.1708	NA	mg/L	N	0	0								Y	210.00	210000	
CLF1B-3	12/12	0%	-	171	180	218.4	220	1709	41.33	0.242	NA	mg/L	N	0	0								Y	329.16	329161	
CLF1B-4	13/13	0%	-	101	92.9	138	180	683.5	26.14	0.2598	NA	mg/L	N	0	0								Y	180.00	180000	
CLF1B-5	14/14	0%	-	221	221.5	269.3	279	1393	37.33	0.1692	NA	mg/L	N	0	0								Y	352.84	352840	
CCR Appendix-III: Chloride (mg/L)																										
PM-1	15/15	0%	-	12.7	12.7	13.43	13.5	0.3498	0.5914	0.04674	NA	mg/L	N	0	0							13.50				
CBW-1	15/15	0%	-	2.79	2.88	3.063	3.21	0.05893	0.2427	0.08696	NA	mg/L	N	0	0											
CLF1B-1	14/14	0%	-	38.5	38.9	41.17	41.5	4.921	2.218	0.05764	NA	mg/L	N	0	0								Y	46.62	46621.7	
CLF1B-2	14/14	0%	-	69.4	70.65	78.74	80.1	99.26	9.963	0.1435	NA	mg/L	N	0	0								Y	91.38	91377	
CLF1B-3	14/14	0%	-	28.6	23.25	50.65	81.2	241.2	15.53	0.5427	NA	mg/L	N	0	0								Y	38.18	38180.5	Y
CLF1B-4	14/14	0%	-	52.2	51	59.67	66.5	22.85	4.78	0.09159	NA	mg/L	N	0	0								Y	60.51	60512.3	Y
CLF1B-5	15/15	0%	-	114	117	139.1	151	341	18.47	0.1622	NA	mg/L	N	0	0								Y	169.25	169249	
CCR Appendix-III: Fluoride (mg/L)																										
PM-1	0/13	100%	0.1-0.1	0.1	0.1	0.1		4.626E-18	2.151E-09	2.151E-08	4	mg/L	N	0	0							0.30				
CBW-1	13/13	0%	-	0.236	0.23	0.294	0.3	0.001642	0.04053	0.1716	4	mg/L	N	0	0											
CLF1B-1	9/13	31%	0.1-0.1	0.128	0.12	0.178	0.19	0.0007974	0.02824	0.2198	4	mg/L	N	0	0									0.24	238.505	
CLF1B-2	6/13	54%	0.1-0.1	0.113	0.1	0.148	0.16	0.0003731	0.01932	0.1708	4	mg/L	N	0	0									0.16	160	
CLF1B-3	8/13	38%	0.1-0.1	0.121	0.12	0.15	0.15	0.0004077	0.02019	0.1672	4	mg/L	N	0	0									0.20	199.326	
CLF1B-4	3/13	77%	0.1-0.1	0.105	0.1	0.124	0.13	0.00009359	0.009674	0.09247	4	mg/L	N	0	0									0.13	130	
CLF1B-5	3/13	77%	0.1-0.1	0.106	0.1	0.132	0.15	0.000209	0.01446	0.1362	4	mg/L	N	0	0									0.15	150	
CCR Appendix-III: pH, Field (pH units)																										
PM-1	20/20	0%	-	5.15	5.2	5.476	5.58	0.06865	0.262	0.05086	NA	pH units	N	0	0							4.09, 5.58				
CBW-1	15/15	0%	-	4.31	4.32	4.5	4.5	0.01706	0.1306	0.03033	NA	pH units	N	0	0											
CLF1B-1	14/14	0%	-	6.58	6.59	6.729	6.82	0.01463	0.121	0.01838	NA	pH units	N	0	0								Y	6.1, 7.08		
CLF1B-2	14/14	0%	-	6.9	6.9	7.083	7.09	0.01655	0.1286	0.01863	NA	pH units	N	0	0								Y	6.52, 7.33		
CLF1B-3	14/14	0%	-	6.71	6.72	6.862	6.94	0.01354	0.1164	0.01734	NA	pH units	N	0	0								Y	6.29, 7.16		
CLF1B-4	14/14	0%	-	7.16	7.19	7.373	7.38	0.01886	0.1373	0.01917	NA	pH units	N	0	0								Y	6.68, 7.68		
CLF1B-5	15/15	0%	-	6.68	6.71	6.781	6.83	0.008641	0.09295	0.01393	NA	pH units	N	0	0								Y	6.35, 7.03		
CCR Appendix-III: Sulfate (mg/L)																										
PM-1	15/15	0%	-	13.8	11.1	25.8	26.5	39.06	6.25	0.4521	NA	mg/L	N	0	0							90.10				
CBW-1	15/15	0%	-	78.6	74.5	97.57	115	157.6	12.56	0.1597	NA	mg/L	N	0	0											
CLF1B-1	14/14	0%	-	139	137.5	153	153	82.09	9.061	0.06502	NA	mg/L	N	0	0								Y	173.86	173860	
CLF1B-2	14/14	0%	-	14.6	13.25	20.58	22.4	9.203	3.034	0.2076	NA	mg/L	N	0	0									22.40	22400	
CLF1B-3	14/14	0%	-	133	145.5	211.1	226	4353	65.97	0.496	NA	mg/L	N	0	0									360.90	360899	
CLF1B-4	14/14	0%	-	18	15.05	32.22	34.3	44.61	6.679	0.3718	NA	mg/L	N	0	0									34.30	34300	
CLF1B-5	15/15	0%	-	145	161	248.6	278	5234	72.35	0.4986	NA	mg/L	N	0	0								Y	395.45	395452	
CCR Appendix-III: Total Dissolved Solids (TDS) (mg/L)																										
PM-1	18/19	5%	40-40	134	136.2	200.6	206	2029	45.05	0.3363	NA	mg/L	N	0	0							266.86				
CBW-1	14/15	7%	40-40	119	120	160.6	181.2	1333	36.5	0.3067	NA	mg/L	N	0	0											
CLF1B-1	14/14	0%	-	590	589.5	649.7	651.7	1535	39.18	0.06638	NA	mg/L	N	0	0								Y	742.95	742949	
CLF1B-2	14/14	0%	-	468	474.1	538.5	545	2925	54.09	0.1155	NA	mg/L	N	0	0								Y	654.66	654660	
CLF1B-3	14/14	0%	-	886	582.3	2365	5355	1675000	1294	1.461	NA	mg/L	N	0	0								Y	5355.00	5355000	
CLF1B-4	14/14	0%	-	349	355	429.8	434	3071	55.42	0.1586	NA	mg/L	N	0	0								Y	540.54	540541	
CLF1B-5	15/15	0%	-	841	812	1100	1155	76090	161.5	0.1921	NA	mg/L	N	0	0								Y	1301.50	1301500	