

**2018 ANNUAL GROUNDWATER  
MONITORING REPORT  
CLASS 3 LANDFILL  
WINYAH GENERATING STATION**

**by Santee Cooper  
Moncks Corner, South Carolina**

**January 2019**

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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 § 257.98.***

The newly constructed Class 3 Landfill at Winyah Generating Station (WGS) received a Permit to Operate from South Carolina Department of Health and Environmental Control on November 1, 2018. This landfill is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) § 257.90 through § 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e).

### 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 2018 for the Class 3 Landfill at WGS as required by the Rule. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.95 is provided in this report.

#### 1.2.1 Status of the Groundwater Monitoring Program

In accordance with § 257.94, groundwater monitoring wells were constructed, and a Detection Monitoring Program was initiated for the newly constructed Class 3 Landfill at WGS. Per Baseline sampling requirements in § 257.94 (b), eight, independent sampling events were conducted at the background well and each downgradient well, and analyzed for Appendix III and Appendix IV constituents prior to the completion and permitting of the landfill and the initial receipt of waste on November 1, 2019.

A summary of the groundwater monitoring program for the Ash pond, including the analytical results for the Appendix III and Appendix IV list of constituents, is presented in Table 1 of this report. All the samples obtained were required by the detection monitoring

program.

### 1.2.2 Key Actions Completed

The following key actions were completed in 2018:

- Initiated Detection Monitoring by collecting Baseline Sampling in accordance with § 257.94(b).

### 1.2.3 Problems Encountered

Problems such as damaged wells or issues with sample collection or lack of sampling were not encountered at the WGS Class 3 Landfill in 2018. However, when compiling the annual report an error was discovered regarding the laboratory reported unit of measure for Calcium. Calcium was analyzed per EPA 6020B and the results were incorrectly reported in parts per billion (ug/L) instead of parts per million (mg/L). This error has been corrected in the Santee Cooper database and this annual report so that Calcium is correctly reported in mg/L.

### 1.2.4 Actions to Resolve Problems

The Calcium reporting values were corrected in the Santee Cooper database.

### 1.2.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2019 include the following:

- Collection of first round of Detection Monitoring and Appendix III Constituents only.
- If statistically significant levels (SSLs) over baseline, then sample Appendix IV constituents.
- If any Appendix IV constituents are detected, sample Appendix III and Appendix IV that were detected.
- Statistical analysis of Assessment Monitoring analytical data to determine if SSLs of the detected appendix IV constituents are present.
- Based on the findings of the statistical analysis, conduct semi-annual groundwater monitoring and subsequent statistical analysis as required by § 257.94 or § 257.95.
- Based on the findings of the statistical analysis, an evaluation of alternate sources, determination of nature and extent, and an assessment of corrective measures will be considered as provided in § 257.95(g)(1) and § 257.95(g)(3).
- Prepare the 2019 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 Class 3 Landfill is presented as Figure 1.

**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;***

Six groundwater monitoring wells were installed in 2018 for this newly constructed Class 3 Landfill.

**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), 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 (baseline), and monitoring data obtained for the groundwater monitoring program for the Class 3 Landfill is presented in Table I of this report. In addition, and as required by § 257.95(d)(3), the groundwater protection standards are included on Table I.

**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***

**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.***

## TABLES

TABLE 1 - Summary of Analytical Results  
Winyah Generating Station Class 3 Landfill

Well ID	Purpose	Date of Sample Event	Appendix III Constituents										Appendix IV Constituents											
			Boron	Boron	Calcium	Calcium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Lithium		
			Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	
Landfill Background Wells																								
WBW-A1-1	Baseline	6/12/2018	36		32		7.43	<0.10		102	203.8	4.7	<25	<5.0		76	<0.5	<0.5	<5.0	<0.5	<0.10	<1.0	<10	
WBW-A1-1	Baseline	7/11/2018	78			54.8	67.5	<0.10		100	352.5	4.47	<5.0	<5.0		108	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	7/17/2018	35			59.5	9.48	<0.10		180	291.2	4.52	<5.0	<5.0		111	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	7/26/2018	36			49	9.25	<0.10		148	272.5	4.4	<5.0	<5.0		94.1	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	7/31/2018	34			45.1	9.31	<0.10		138	247.5	4.58	<5.0	<5.0		87	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	8/7/2018	42			38.6	8.51	<0.10		119	196.2	4.46	<5.0	<5.0		77.1	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	8/15/2018	38			36.4	8.72	<0.10		114	203.8	4.58	<5.0	<5.0		80.3	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	Baseline	8/22/2018	37			47.2	9.49	<0.10		149	256.2	4.38	<5.0	<5.0		98	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WBW-A1-1	total samples		8	0	1	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	
Class 3 Landfill Wells																								
WAP-7	Baseline	6/13/2018	800		520		21.7	<0.10		984	1789	6.25	<25	<5.0		32	<0.5	<0.5	<5.0		0.5	<0.10	<1.0	<10
WAP-7	Baseline	7/11/2018	890			566	21.8	<0.10		1220	1870	6.32	<5.0	<5.0		30.2	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	7/17/2018	910			576	24.6	<0.10		1120	1936	6.24	<5.0	<5.0		33.9	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	7/26/2018	110			132	11.8	<0.10		273	540	5.38	<5.0	<5.0		21.1	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	7/31/2018	110			127	11.6	<0.10		257	500	5.92	<5.0	<5.0		23.4	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	8/7/2018	120			108	7.53	<0.10		260	433.8	5.36	<5.0	<5.0		23.8	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	8/13/2018	450			313	14.1	<0.10		612	1151	5.92	<5.0	<5.0		33.9	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	Baseline	8/22/2018	640			346	15	<0.10		707	1289	6.1	<5.0	<5.0		31.6	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WAP-7	total samples		8	0	1	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	
WLF-A1-1																								
WLF-A1-1	Baseline	6/13/2018	4100		620		270	<0.10		978	2480	6.43	<25	<5.0		49	<0.5	<0.5	<5.0		0.5	<0.10	<1.0	<10
WLF-A1-1	Baseline	7/11/2018	3900			609	253	<0.10		942	2392	6.47	<5.0	<5.0		49.6	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	7/17/2018	4000			746	205	<0.10		1040	2339	6.47	<5.0	<5.0		45.4	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	7/26/2018	3600			596	173	<0.10		1060	2321	6.4	<5.0	<5.0		40.2	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	8/1/2018	3700			487	175	<0.10		1070	2214	6.41	<5.0	<5.0		37.5	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	8/8/2018	3500			575	147	<0.10		1060	2058	6.29	<5.0	<5.0		32.9	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	8/13/2018	3900			550	143	<0.10		1028	2175	6.41	<5.0	<5.0		32.7	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	Baseline	8/22/2018	3800			509	142	<0.10		1000	2165	6.36	<5.0	<5.0		29.4	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-1	total samples		8	0	1	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	
WLF-A1-2																								
WLF-A1-2	Baseline	8/12/2018	370		60		38.6		0.11	62.5	359.4	6.25	<25	<5.0		14	<0.5	<0.5	<5.0			0.11	<1.0	<10
WLF-A1-2	Baseline	7/11/2018	840			104	QA		0.13	QA	477.5	6.6	<5.0	<5.0		29.9	<0.50	<0.50	<5.0	<0.50		0.13	<1.0	<10
WLF-A1-2	Duplicate	7/11/2018	660			104	65.2	<0.10		97.1	470		<5.0	<5.0		30.2	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-2	Baseline	7/17/2018	720			102	211	<0.10		1040	430	6.49	<5.0	<5.0		53.9	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-2	Baseline	7/26/2018	610			151	32.4		0.12	306	612.5	6.55	<5.0	<5.0		66.3	<0.50	<0.50	<5.0	<0.50		0.12	<1.0	<10
WLF-A1-2	Baseline	7/31/2018	720			153	44.5		0.14	266	642.5	6.29	<5.0	<5.0		50.7	<0.50	<0.50	<5.0	<0.50		0.14	<1.0	<10
WLF-A1-2	Baseline	8/7/2018	1800			187	122	<0.10		238	890	6.67	<5.0	<5.0		62.9	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-2	Baseline	8/15/2018	550			160	27.1	<0.10		316	616.2	6.29	<5.0	<5.0		57.8	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-2	Baseline	8/23/2018	200			152	28	<0.10		323	628.8	6.14	<5.0	<5.0		62.1	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-2	total samples		9	0	0	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0	
WLF-A1-3																								
WLF-A1-3	Baseline	8/12/2018	73		6.5		2.81	<0.10		43	90.62	4.2	<25	<5.0		35	<0.5	<0.5	<5.0		0.6	<0.10	<1.0	<10
WLF-A1-3	Baseline	7/11/2018	97			8.48	8.58	<0.10		160	101.2	4.23	<5.0	<5.0		38	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-3	Baseline	7/18/2018	95			8.12	59.3	<0.10		169	88.25	3.91	<5.0		5.64	40.5	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-3	Baseline	7/26/2018	86			7.45	3.67	<0.10		40.2	88.75	4.13	<5.0		7.8	35.2	<0.50	<0.50	<5.0	<0.50	0.5	<0.10	<1.0	<10
WLF-A1-3	Baseline	7/31/2018	69			8.83	3.89	<0.10		41.6	96.25	4.12	<5.0		8.2	36.1	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-3	Baseline	8/7/2018	100			7.36	3.98	<0.10		43	83.75	4.15	<5.0		9.9	37	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-3	Baseline	8/15/2018	110			9.74	4	<0.10		48.5	111.2	4.12	<5.0		6.4	39.6	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-3	Baseline	8/23/2018	480			13.6	3.44	<0.10		57.7	90	4.1	<5.0	<5.0		34.5	<0.50		0.77	<0.50	<0.10	<1.0	<10	
WLF-A1-3	total samples		8	0	1	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	
WLF-A1-4																								
WLF-A1-4	Baseline	6/12/2018	360		130		5.32	<0.10		105	455	6.58	<25	<5.0		36	<0.5	<0.5	<5.0	<0.5	<0.10	<1.0	<10	
WLF-A1-4	Duplicate	8/12/2018	370		130		5.22	<0.10		102	455		<25	<5.0		35	<0.5	<0.5	<5.0	<0.5	<0.10	<1.0	<10	
WLF-A1-4	Baseline	7/11/2018	390			133	4.3	<0.10		103	458.8	6.38	<5.0	<5.0		36.4	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-4	Baseline	7/18/2018	420			135	6.96	<0.10		127	526.2	6.02	<5.0	<5.0		38.7	<0.50	<0.50	<5.0	<0.50	<0.10	<1.0	<10	
WLF-A1-4	Duplicate	7/18/2018	420																					

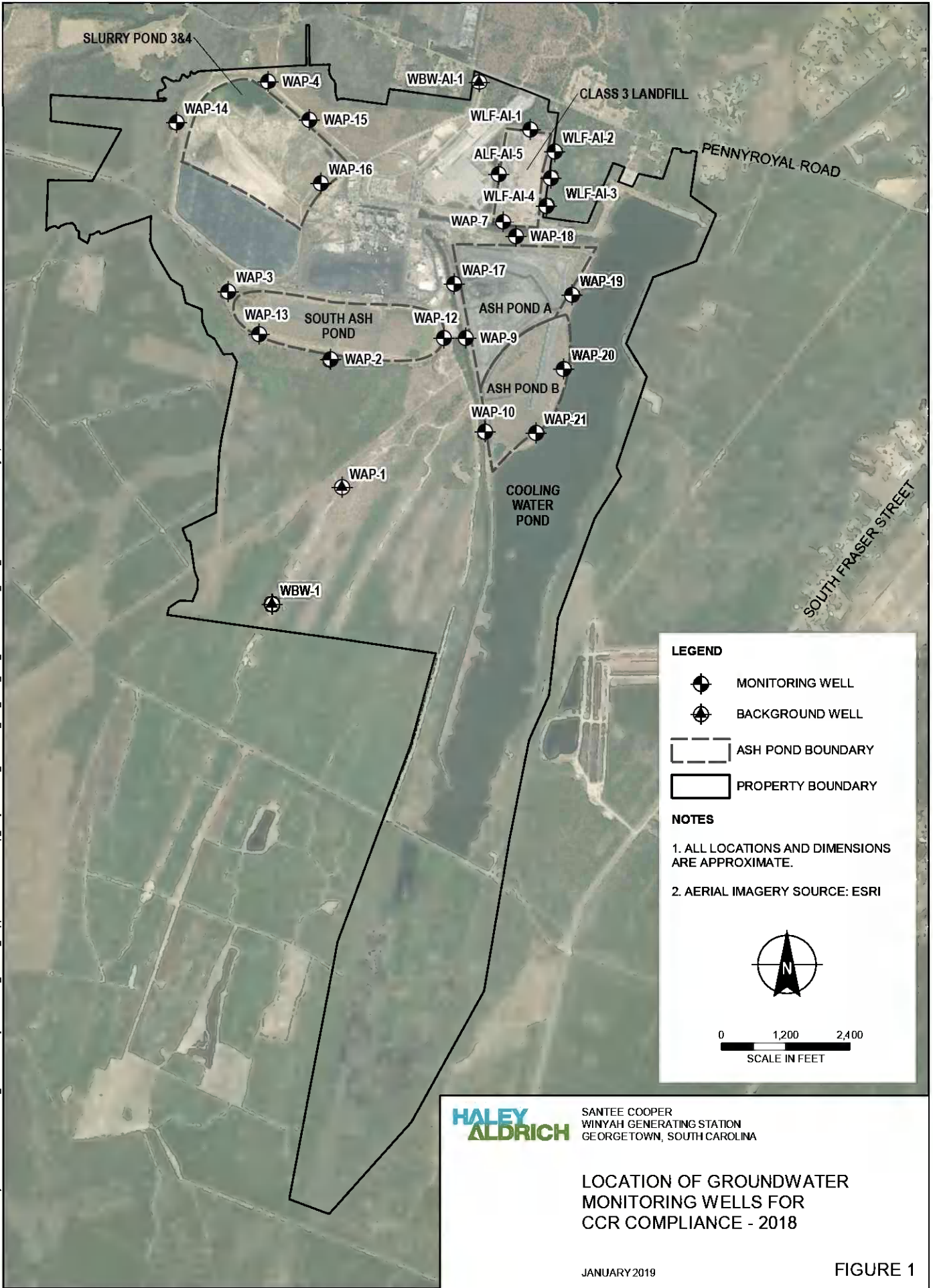






## FIGURES

GIS FILE PATH: \\haleyaldrich.com\share\bol\_common\Projects\42122\_Santee\_Copper\GIS\Map\_Projects\2019\_01\42122\_000\_0001\_GW\_MONITORING\_FOR\_CCR.mxd — USER: apcppe — LAST SAVED: 1/28/2019 4:55:30 PM



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### LOCATION OF GROUNDWATER MONITORING WELLS FOR CCR COMPLIANCE - 2018

JANUARY 2019

FIGURE 1