

# March 2024 Monthly Compliance Report

Solid Waste Permit No. 498  
Bristol Integrated Solid Waste Management Facility  
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## **INTRODUCTION**

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) in accordance with item 8 in Appendix B of the Consent Decree between the City and VDEQ. This report provides updates regarding the progress towards completion of the items outlined in Appendix B of the Consent Decree between the City and VDEQ. The following sections outline progress during the month of March 2024 related to Solid Waste Permit (SWP) No. 498.

### **1.0 LEACHATE PUMP STATION**

The City completed repairs to the pumps and addressed other concerns related to the leachate pump station. The steps taken by the City are outlined in the following sections.

#### **1.1 FLOATING MATERIAL**

As described in the October 2022 Monthly Compliance Report for the SWP No. 498 Landfill, the floating material in the wet well was resolved.

#### **1.2 PUMP REPLACEMENT**

The City contracted with Buchanan Pump Service (Buchanan) to complete repairs to the pumps and infrastructure at the SWP No. 498 pump station. Buchanan completed repairs and replacement of the pumps at the SWP No. 498 pump station.

#### **1.3 ALARM/NOTIFICATION SYSTEM**

The alarm system at the SWP No. 498 Landfill pump station is currently functional and sending alerts to landfill staff via text message.

### **2.0 COVER INTEGRITY AND EXPOSED WASTES**

The sections below describe steps taken by the City to address cover integrity and exposed wastes.

#### **2.1 ALTERNATE DAILY COVER**

During the month of March conventional daily cover (6 inches of soil) and alternate daily cover (ADC) tarps were used in areas where waste was disturbed as part of construction efforts described in Section 4.2.

#### **2.2 INTERMEDIATE COVER**

Placement of intermediate soil cover on the SWP No. 498 landfill is complete. Soil placement and thickness verification was documented in the April 2023 Compliance Report for the SWP No. 498 Landfill. The City will continue to monitor the intermediate cover integrity on a regular basis until final cover has been installed. The intermediate cover was initially disturbed during the month of November as part of the construction of the landfill gas collection and control system (LFGCCS) and

final cover. Some disturbance of the intermediate cover continues to occur as part of construction efforts described in Section 4.2. Intermediate cover disturbed as part of construction will be replaced as part of final cover system installation.

## 2.3 SURFACE EMISSIONS MONITORING

On March 12, 2024, SCS performed the first quarter 2024 surface emissions monitoring event on the landfill.

The monitoring was performed in accordance with the site-specific GCCS Design Plan, the facility’s Title V Permit, the requirements of 40 CFR 63.1960(c) and (d), 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route included all applicable areas of the Permit No. 498 landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint.

One exceedance was detected during this monitoring event at the surface cover penetration of EW-19. A quarterly SEM report documenting corrective actions and remonitoring results will be submitted to the VDEQ as part of the Semi-Annual Report.

Table 1 summarizes the results of the monitoring event.

Table 1. Summary of March Surface Emissions Monitoring

Description	March 12, 2024
Number of Points Sampled	69
Number of Points in Serpentine Route	66
Number of Points at Surface Cover Penetrations	3
Number of Exceedances	1
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	1

The second quarter SEM Event will be completed prior to June 30, 2024.

## 3.0 GAS COLLECTION

The City has taken steps to optimize gas collection and minimize air intrusion as outlined in the sections below.

### 3.1 OPTIMIZATION PLAN AND REPORTING

The SWP No. 498 Landfill is approximately 12.0 acres and is located south of the SWP No. 221 Landfill and east of the SWP No. 588 Landfill. The majority of the SWP No. 498 Landfill does not

have an active LFG collection system; however, installation of a comprehensive active LFG collection system is in process as described in Section 4.2. The existing system includes three vertical wells (EW-19, EW-20, and EW-21) and a condensate trap (CT-1) at the low point. SWP No. 498 Landfill has no history of elevated temperatures and is not a significant source of odors.

To accommodate the Area 498 Final Closure and LFGCCS Plan, on November 1, 2023 all wells and isolation valves within the waste footprint were shut so that excavation could begin. The corresponding vacuum lateral piping was also removed.

### **3.1.1 Optimization Plan**

On December 1, 2022, on behalf of the City, SCS submitted a plan that provides for means and methods for optimizing the performance of the existing gas extraction system in the SWP No. 498 landfill. Additional details about that plan were included along with a copy of the plan in the November Monthly Compliance Report for the SWP No. 498 Landfill.

### **3.1.1 Optimization Actions**

During the month of January 2023 actions were taken to implement the submitted Optimization Plan. The actions taken at the SWP No. 498 Landfill in accordance with the plan were summarized in the January 2023 Monthly Compliance Report for the SWP No. 498 Landfill.

### **3.1.2 Monthly Wellhead Monitoring**

On March 22, 2024, SCS-FS visited the landfill and performed monitoring of the landfill gas wells. The results of the monthly monitoring were submitted to VDEQ on April 3, 2024 and are included in Appendix A. The results of the monthly monitoring also include comments regarding observations and adjustments made by the field technician.

The monthly wellhead monitoring data are summarized in Appendix A. Wells EW-16, EW-17, EW-18, and EW-23 are outside the waste footprint. These collectors show low methane concentrations, as well as low flow, and are kept under minimal vacuum. Wells EW-19, EW-20, EW-21, and EW-22 are within the waste footprint and, when operating, exhibit gas concentrations that are consistent with older landfill gas. Due to ongoing construction, only the wells outside the waste footprint were monitored. The low methane content in EW-16, EW-17, EW-18, and EW-23 (Appendix A) suggests that very little LFG is present outside the SWP No. 498 waste footprint.

The average gas composition in wells within the SWP No. 498 waste footprint is shown in Table 2. The methane-to-carbon dioxide ratio measured in the wellheads in the waste is occasionally less than 1 because the organic fraction of the waste is more fully decomposed and the rate of methanogenesis has declined.

Table 2. Monthly Average Wellhead LFG Composition of SWP No. 498 Wells in Waste Footprint

Month	Average CH <sub>4</sub> (% Vol)	Average CO <sub>2</sub> (% Vol)	Average O <sub>2</sub> (% Vol)	Average Pressure (inches w.c.)
September 2023	7.5	9.1	11.8	-4.5
October 2023	4.7	6.6	15.1	-4.2
November 2023	2.7	9.0	12.4	-13.1
December 2023 <sup>1</sup>	--	--	--	--
January 2024 <sup>1</sup>	--	--	--	--
February 2024 <sup>1</sup>	--	--	--	--
March 2024 <sup>1</sup>	--	--	--	--

<sup>1</sup> Wells within waste offline due to final cap construction; average concentrations of perimeter migration control wells reported as a substitute.

Liquid levels were measured in EW-19, -20, -21 and new well risers constructed on the horizontal collectors within SWP No. 498 for informational purposes related to ongoing construction activities. The liquid level dataset is found in Appendix A.

## 4.0 GRADING, GEOMETRIC CONFIGURATION AND GAS EXPANSION

The City took the steps outlined in the sections below to grade the surface of the SWP No. 498 landfill to an appropriate geometric configuration to allow for final closure.

### 4.1 CLOSURE AND LFGCCS PLAN

SCS prepared plans on the City's behalf for closing and installing final cover on the Solid Waste Permit No. 498 landfill. The plans also include a comprehensive gas collection and control system and comprehensive stormwater management plan. VDEQ issued the 18<sup>th</sup> modification of the SWP No. 498 permit, which incorporated these plans on January 17, 2024.

On February 26, 2024, SCS requested a minor modification to the solid waste permit on behalf of the City. The modification included a revised technical specification for the Agru MicroDrain Liner (geomembrane). Revisions to this specification modified the required transmissivity. Supporting calculations were prepared showing the adequacy of the modified transmissivity for the geometric conditions of the final cover. The frequency of transmissivity testing was also changed and confining pressures were added to the transmissivity testing requirements. The minor modification, no. 19, was approved by VDEQ in a letter date March 1, 2024.

On March 28, 2024, SCS requested an additional minor modification to the solid waste permit on behalf of the City. The modification includes a revised landfill gas remediation plan.

### 4.2 FINAL COVER AND LFGCCS INSTALLATION

The drawings described in Section 4.1 were used as the basis of bid drawings for procurement of a contractor to complete final cover and LFGCCS installation. Baker's Construction Services, Inc. (BCS)

is currently constructing the final cover system and LFGCCS. SCS CQA personnel are mobilized to the site to monitor BCS's progress.

Figure 1. Landfill Gas Pressure Testing - SWP No. 498 Landfill





Figure 2. Landfill Gas Road Crossing - SWP No. 498 Landfill



Landfill gas construction progress during March included installing the air and force main tie-ins, installing road crossings, abandonment of EW-22, and pressure testing. Figures 2 and 3 show the pressure testing of landfill gas pipe and the installation of a road crossing for the landfill gas header. New air and force main lines were tied into the existing lines located west of the landfill, and isolation valves were installed (see Figure 4).

Figure 3. Air and Force Main Tie-In with Isolation Valves



Installation of intermediate cover soil continued along the west side of the final cover area during early and mid-March. Density and depth testing continued as the soil installation progressed. During this same period, as the target grade was reached, BCS prepared for geomembrane deployment by hand picking and mechanical raking of the cover soil surface to remove rocks and debris (see Figure 5). The surface was smooth-drum rolled prior to installing the geomembrane.

Figure 4. Mechanical Raking of the Intermediate Cover Soil Surface



Hallaton Environmental Linings (Hallaton) commenced geomembrane deployment on March 20, 2024. The first rolls were placed in an east-west orientation, starting on the west side of the landfill (see Figure 6). SCS is observing and documenting the geomembrane installation, and quality assurance efforts include logging welding progress, panel placement, repair locations, air pressure testing (Figure 7), and destructive sample locations. SCS is using field GPS equipment to prepare the as-built geomembrane layout.

Figure 5. Geomembrane Installation on March 22<sup>nd</sup>



Figure 6. Air Pressure Testing of Geomembrane Seam



## **5.0 LEACHATE SEEPS AND PONDING**

The sections below describe the steps taken by the City to address leachate seeps and ponding.

### **5.1 PERIODIC INSPECTIONS**

The City initiated a process of tracking precipitation events that have the potential to create ponding and leachate seeps. After major precipitation events, City personnel inspect the landfill for ponding and leachate seeps. Locations of ponding and seeps are marked in the field.

The City performed inspections as appropriate during the month of March. Inspection forms have been scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records. Completed inspection forms are available for VDEQ to review upon request.

### **5.2 COMPLETION OF WORK ACTIVITIES**

During the month of April 2023, the City completed work activities which eliminated areas of ponding and accomplished leachate seep repairs. Details about these activities were included in the April 2023 Compliance Report for the SWP No. 498 Landfill. Currently ponding and seeps are managed by the earthwork contractor responsible for installing final cover and LFGCCS.

## **6.0 STORMWATER DRAINAGE AND MANAGEMENT**

The sections below outline the steps by the City to improve stormwater management and drainage.

### **6.1 STORMWATER MANAGEMENT PLAN**

As noted in Section 4.1 the SWP No. 498 Closure plans included measures to address stormwater management. Following the installation of the final cover system, stormwater diversion berms and downchutes will be installed. Stormwater will be conveyed to perimeter channels and a stormwater sewer system which primarily discharge to the stormwater pond located at the northeast corner of the landfill.

The existing stormwater pond positioned near the northeast corner of the landfill has been expanded to provide additional storage volume, and a new stormwater outlet structure has been installed. The stormwater pond will discharge via the existing 42-in reinforced concrete pipe (outfall SW-1). Stormwater modeling included with the permit modification documents demonstrates compliance with channel and flood protection criteria.

Stabilization of the stormwater basin area was started in February and is ongoing. Vegetation growth is expected continue during the spring of 2024. Figure 7 shows the conditions of the stormwater pond during the month of March 2024.

Figure 7. Stormwater Basin Status



## **6.2 CLEANOUT OF STORMWATER DIVERSION CHANNEL/TRENCH BERM**

Clean-out of the stormwater diversion channel/trench berm was completed in February 2023. The clean-out of the stormwater diversion channel/trench berm was discussed in the February 2023 Monthly Compliance Report for the SWP No. 498 Landfill. On March 15, 2023, SCS submitted a letter to VDEQ verifying completion of the stormwater diversion channel/trench berm clean-out. A copy of that letter and supporting documentation were included in the March 2023 Monthly Compliance Report for the SWP No. 498 Landfill.

## **7.0 SELF-INSPECTION AND RECORDKEEPING**

SCS prepared two self-inspection log templates, the Stormwater Management Inspection Log and the Daily Landfill Inspection Log. SCS provided updated self-inspection logs for SWP 498 to the City and VDEQ and completed self-inspection training with facility staff on November 30, 2022.

### **7.1 UPDATED SELF-INSPECTION LOGS**


Copies of updated self-inspection log templates were submitted to VDEQ on November 30, 2022. Details about this log and the intended inspection process were detailed in the November 2022 Monthly Compliance Report for the SWP No. 498 Landfill. Copies of the log templates are also included in that report.

## **7.2 FACILITY TRAINING**

On November 30, 2022, SCS personnel met members of the Facility staff to complete self-inspection training. A summary of this training and a record of attendees was included in the November Monthly Compliance Report for the SWP No. 498 Landfill.

## **7.3 SELF-INSPECTION AND RECORDKEEPING ASSIGNMENTS**

Completed inspections will be held on-site at the facility office available for review by VDEQ upon request. Currently, self-inspections are being completed by Jonathan Hayes. Dave Cochran will serve as the primary alternate for inspections with the other members of the staff trained on inspection procedures filling in as needed. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records.



Appendix A  
March Monthly Wellhead Monitoring Data



## Bristol Virginia Landfill - Permit 498 Well Data - 01/01/2024 to 03/31/2024

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	Temp (F)	System Pressure ("H2O)	Comments
16	1/11/2024 10:31	1.5	1.3	20.7	76.5	-22.9	-22.6	56.6	-22.9	Valve Adjustment:No Change
16	2/2/2024 10:12	22.8	18.1	10.4	48.6	-16.5	-16.2	49.1	-16.5	Valve Adjustment:No Change
16	3/22/2024 12:41	0.1	0.0	21.1	78.9	-7.4	-7.2	66.6	-14.5	Valve Adjustment:No Change
17	1/11/2024 10:34	1.7	1.1	21.1	76.1	-22.0		51.3	-22.0	Valve Adjustment:No Change
17	2/2/2024 10:15	54.5	38.0	0.1	7.3	-16.3	-16.4	47.5	-16.1	Valve Adjustment:No Change
17	3/22/2024 12:44	0.0	0.0	21.3	78.7	-13.8	-13.8	71.4	-13.7	Valve Adjustment:No Change
18	1/11/2024 08:55	42.3	34.7	0.7	22.3	-21.2	-21.0	49.4	-22.6	Valve Adjustment:No Change
18	2/2/2024 10:07	15.1	12.8	15.1	57.0	-16.2	-15.9	49.8	-16.5	Valve Adjustment:No Change
18	3/4/2024 10:12	12.1	9.1	15.7	63.1	-14.1	-14.0	71.1	-14.3	Valve Adjustment:No Change
19	01/2024									Disconnected for construction
19	02/2024									Disconnected for construction
19	03/2024									Disconnected for construction
20	01/2024									Disconnected for construction
20	02/2024									Disconnected for construction
20	03/2024									Disconnected for construction
21	01/2024									Disconnected for construction
21	02/2024									Disconnected for construction
21	03/2024									Disconnected for construction
23	1/11/2024 10:14	0.3	0.6	21.4	77.7	-4.8	-5.0	41.4	-16.7	Valve Adjustment:No Change
23	2/2/2024 10:32	0.0	0.0	21.6	78.4	-3.3	-4.3	41.9	-12.1	Valve Adjustment:No Change
23	3/4/2024 10:23	0.1	0.3	20.5	79.1	-4.9	-4.9	49.7	-11.4	Valve Adjustment:No Change



Bristol Permit 498 Liquid Levels 3/27/2024

Well ID	Well case height above ground (feet)	Depth to Bottom from TOC (feet)	Depth to Liquid from TOC (feet)	Water column (feet)	Comments
EW-19	4.9	20.0	17.7	3.3	
EW-20	7.3	35.1	19.8	15.3	
EW-21					Cannot reach, well case over 10' tall
DP-1	7.2	17.1	15.1	2.0	
DP-2	6.4	17.4	17.4	0.0	dry
DP-3	6.7	17.1	12.7	4.4	
DP-4	6.7	17.3	14.8	2.5	
DP-5	6.2	16.8	10.6	6.2	
DP-6	6.9	16.9	16.9	0.0	dry
DP-7	6.9	16.9	13.0	3.9	
HC-4	6.9	16.9	16.9	0.0	dry
HC-5	4.9	16.9	16.8	0.1	
HC-6	5.8	16.8	16.8	0.0	dry
HC-7	7.0	16.8	16.8	0.0	dry
HC-8	7.5	16.9	13.1	3.8	
HC-9	7.0	16.8	13.4	3.4	

TOC=Top of casing