

# February 2024 Monthly Compliance Report

Solid Waste Permit No. 498  
Bristol Integrated Solid Waste Management Facility  
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**SCS ENGINEERS**

02218208.05-30 | March 8, 2024

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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 February 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 February 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 December 13, 2023, SCS performed the fourth quarter 2023 surface emissions monitoring event on the landfill. During the monitoring event, no exceedances were detected on the serpentine route or at the pipe penetrations. Details of the surface emissions monitoring were included in the December 2023 Monthly Compliance Report for the SWP No. 498 Landfill. A letter outlining the results was included in the Semi-Annual Report that was submitted to VDEQ on March 1, 2024.

The first quarter SEM Event will be performed prior to March 31, 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 SYSTEM OPTIMIZATION**

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.

To accommodate the Area 498 Final Closure and LFGCCS Plan, on November 1, 2023 all wells and isolation valves were shut so that excavation could begin. The corresponding vacuum lateral piping was removed. Routine extraction well monitoring was unable to be completed for the month of February due to these devices being offline for ongoing construction. Additional information regarding the Area 498 Closure and LFGCCS Plan can be found in section 4.1.

The buried waste in SWP No. 498 Landfill Area is greater than 25 years old. Thus, the rate and quantity of decomposition gas production has declined significantly compared to the rate and quantity of LFG generated in more recently buried wastes. Wells EW-16, EW-17, EW-18, and EW-23 are outside the waste footprint. 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. These collectors show low methane concentrations, as well as low flow, and are kept under minimal vacuum.

There is no historical evidence of elevated temperatures in Area 498; however, 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. Also, the SWP No. 498 Landfill is not believed to be a significant source of odors. The average gas composition in the SWP No. 498 wells is shown in Table 1.

Table 1. Monthly Average Wellhead LFG Composition – SWP No. 498 Wells

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	5.5	6.1	14.7	-4.2
October 2023	22.8	20.9	10.2	-4.3
November 2023	11.8	15.2	11.4	-13.6
December 2023 <sup>1</sup>	2.8	2.6	20.1	-15.8
January 2024 <sup>1</sup>	11.0	8.8	16.5	-17.4
February 2024 <sup>1</sup>	23.1	17.2	11.8	-13.2

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

During the month of February, EW-16 was modified to add a horizontal collector to the vertical extraction well. A trench was excavated adjacent to the existing EW-16. A perforated pipe was placed in the trench and connected to the existing EW-16. The trench was backfilled with aggregate and a geotextile was placed over the aggregate before the horizontal collector was covered with soil. Construction of the horizontal collector is shown in Figure 1. This horizontal collector was added to improve the effectiveness of EW-16 and reduce the percentage of methane in measurements of gas composition at GP-200.

Figure 1. Construction of a Horizontal Collector and EW-16



## **3.2 OPTIMIZATION PLAN AND REPORTING**

### **3.2.1 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.

### **3.2.2 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.

### **3.2.3 Monthly Wellhead Monitoring**

On February 2, 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 March 6, 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.

## **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.

### **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. The drawings used for the purposes of bidding, procurement and construction of the final closure, gas collection system, and stormwater controls generally conform to the layout and details in the permit modification drawings.

The City and Baker's Construction Services, Inc. (BCS) signed the construction contract and the notice to proceed was issued on October 17, 2023. BCS mobilized to the site in late October and construction is currently ongoing. Construction so far has included the installation of erosion and sediment control measures, ongoing earthwork to establish the geomembrane deployment grade, excavation of the expanded stormwater basin, installation of the stormwater sewer system, and the ongoing installation of the new landfill gas system. SCS CQA personnel are mobilized to the site to monitor BCS's progress.

Figure 2. Landfill Gas Installation Progress - SWP No. 498 Landfill





Figure 3. Landfill Gas Installation Progress - SWP No. 498 Landfill



Construction progress during February included installing landfill gas horizontal collectors, 8" and 6" headers, airline, and force main. Figures 2 and 3 show the fusing of the landfill gas pipes (left) and the connection of the landfill gas headers to the new condensate sump (right). The lateral connections to the new soil extraction wells (drilled during January) were also installed along with new landfill gas drainage pits and horizontal collector wellheads (see Figure 4).

Figure 4. Horizontal Collector Wellhead and Drainage Pit Installation



Installation of intermediate cover soil continued along the west side of the final cover area. Density and depth testing continued as the soil installation progressed (see Figure 5). BCS continued to develop the new borrow area for installation of the remaining intermediate cover soil and upcoming erosion control layer.

Figure 5. Soil Density testing



## 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 February. 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.

Figure 6. Installation of Outlet Protection in the Stormwater Basin



Stormwater construction progress during February included installing covers for the stormwater drop inlets and stabilizing the stormwater basin area. Outlet protection was installed for the stormwater pipes discharging into the basin.

Figure 7. Stabilizing Stormwater Basin Area



## 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  
February Monthly Wellhead Monitoring Data

## Bristol Virginia Landfill - Permit 498 Well Data - 12/01/2023 to 02/29/2024

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	12/15/2023 09:36	0.7	1.1	20.9	77.4	-20.9	-20.9	51.4	-21.0	Valve Adjustment:No Change
16	1/11/2024 10:31	1.5	1.3	20.7	76.5	-22.9	-22.6	56.7	-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
17	12/15/2023 09:41	0.2	0.2	21.6	78.1	-20.9	-20.9	52.7	-20.9	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
18	12/15/2023 09:45	10.4	9.0	16.1	64.6	-20.4	-20.3	59.7	-20.9	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	50.0	-16.5	Valve Adjustment:No Change
19	12/2023									Disconnected for construction
19	01/2024									Disconnected for construction
19	02/2024									Disconnected for construction
20	12/2023									Disconnected for construction
20	01/2024									Disconnected for construction
20	02/2024									Disconnected for construction
21	12/2023									Disconnected for construction
21	01/2024									Disconnected for construction
21	02/2024									Disconnected for construction
23	12/15/2023 10:31	0.0	0.3	21.7	78.0	-0.8	-0.8	45.8	-2.8	Valve Adjustment:No Change
23	1/11/2024 10:14	0.3	0.6	21.4	77.7	-4.8	-5.0	41.6	-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

