February
Monthly Compliance Report

Solid Waste Permit #498
Bristol Integrated Solid Waste Management Facility
2655 Valley Drive
Bristol, VA 24201
(276) 645-7233

SCS ENGINEERS

02218208.05-18 | March 10, 2023

15521 Midlothian Turnpike Suite 305
Midlothian, VA 23113
804-378-7440

Table of Contents

Figures

Table of Contents

Section Page

Appendices

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 covers the Solid Waste Permit (SWP) #498 Landfill during the month of February.

1.0 LEACHATE PUMP STATION

The City is in the process of repairing the pumps and addressing other concerns related to the leachate pump station. The steps taken by the City are outlined in the following sections.

1.1 FLOATING MATERIAL

On July 6, 2022 SCS received the results of samples taken from the Solid Waste Permit 498 Wet Well on May 25, 2022. Based on SCS' review of the data, the data indicated the liquid is non-hazardous. SCS submitted a letter to the City on July 7, 2022 with SCS' review of the data and the underlying lab analysis. A copy of this letter was included in the October Monthly Compliance Report for the SWP #498 Landfill

As described in the October Monthly Compliance Report for the SWP #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 498 pump station. Buchanan completed repairs to one pump (in addition to the pump currently operating at the pump station. Buchanan delivered a third pump to the site, however the electrical requirements of the pump exceeded what could be supported with existing infrastructure. Buchanan is now in the process of procuring another pump that will operate utilizing the existing electrical infrastructure.

1.3 ALARM/NOTIFICATION SYSTEM

The City's Information Technology (IT) department has inspected, diagnosed, and repaired the existing pump station alarm/notification system. The alarm system is now 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 INTERMEDIATE COVER

City staff estimate that intermediate cover has been placed on more that 85 percent of the landfill area. The slopes of the landfill continue to present challenging conditions for the City. Inclement weather has continued to prevent the City from safely placing cover on the slopes. In addition, placement of intermediate cover on the slopes has been slowed by the presence of thick vegetation

that must be removed prior to placement. The City intends to complete soil placement on the Solid Waste Permit #498 landfill during the month of March if weather permits.

2.2 SURFACE EMISSIONS MONITORING

On December 19, 2022, SCS performed surface emissions monitoring (SEM) on the landfill. During the monitoring event no exceedances were detected on the serpentine route or at pipe penetrations. Details of the SEM were included in the December Monthly Compliance Report for the SWP #498 Landfill.

SCS understands that the Solid Waste Permit #498 Landfill is subject to quarterly SEM and therefore SEM was not required to be performed this month. The first quarter SEM for the SWP #498 landfill will occur in March.

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 #498 Landfill is approximately 12.0 acres and is located south of the SWP #221 Landfill and east of the SWP #588 Landfill. As of September 2022, mining in Permit #498 has concluded. The majority of the SWP #498 Landfill does not have an active LFG collection system, due to mining operations which have occurred since waste placement was completed. The current system includes three vertical wells (EW-19, EW-20, and EW-21) and a condensate trap (CT-1) at the low point. Field reconnaissance efforts in September/October 2022 identified that the header pipe serving the three wells had been severed, blocked, or otherwise compromised. Vacuum was restored to EW-19 in November 2022. As of January 18, 2023, the blocked header piping was replaced, restoring vacuum to wells EW-20 and EW-21.

The buried wastes in SWP #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. Accordingly, the methane concentration tends to be substantially lower, the oxygen and nitrogen concentrations tend to be substantially greater, and the quantity of LFG collected declines substantially compared to the years immediately after waste placement. Furthermore, much of the organic wastes in the upper layer have likely decomposed aerobically (i.e., were composted) because of the mining operations. There is no historical evidence of elevated temperatures in SWP #498; however, the methane-to-carbon dioxide ratio measured in the wellheads can sometimes be less than 1 due to the fact that the wastes are becoming biochemically stabilized (meaning organic wastes have been more fully decomposed) and the rate of methanogenesis has declined. Also, the #498 Landfill Area is not believed to be a significant source of odors.

Extraction wells EW-16, EW-17, EW -18, and EW-23 are perimeter migration control wells affiliated with Permit #498. These wells were monitored and adjusted as needed to control migration.

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 Solid Waste Permit #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 #498 Landfill.

3.2.2 Optimization Actions

During the month of January 2022 actions were taken to implement the submitted Optimization Plan. The actions taken at the SWP #498 Landfill in accordance with the plan were summarized in the January Monthly Compliance Report for the SWP #498 Landfill. SCS prepared a report that detailed the results of each of these activities and the report was submitted to VDEQ on February 1, 2023.

3.2.3 Monthly Wellhead Monitoring

On February 1, 2023, 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 1, 2023 and are included in Appendix A.

4.0 GRADING, GEOMETRIC CONFIGURATION AND GAS EXPANSION

The City has taken the steps outlined in the sections below to grade the surface of the SWP #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 #498. The plans also include a comprehensive gas collection and control system and comprehensive stormwater management plan. The design addressed the gas collection infrastructure, grading work to be completed prior to installation, estimates of stormwater volumes, stormwater calculations, and construction materials to be used.

The drawings (16 sheets) titled "SWP #498 Final Closure System Permit Modification Design Plans" were submitted to VDEQ on January 31, 2023. Supporting documentation was also included for the purposes of the modification to the facility's Solid Waste Permit.

On February 24, 2023 SCS submitted additional documentation to VDEQ that is required for the purpose of modifying the facility's Solid Waste Permit. A revised drawing set was also submitted with this package that included modifications to the proposed LFGCCS.

4.2 FINAL COVER AND LFGCCS INSTALLATION

The drawings described in Section 4.1 will be used as the basis of bid drawings used 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 will generally conform to the layout and details in the attached drawings. In addition to the drawings SCS will prepare a detailed project manual including technical specifications. SCS will also continue to work with VDEQ to complete the permit modification incorporating the revised closure design into the facility's solid waste permit.

5.0 LEACHATE SEEPS AND PONDING

The sections below outline 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. Inspections are made following events that exceed 0.25 inches as recorded by the on-site weather station. For the purposes of these inspections, if precipitation is continuous for at least 8 hours during a storm that lasts multiple days, that storm will be considered a single event requiring a single inspection. After each such event, City personnel will inspect the landfill for ponding and leachate seeps. Locations of ponding and seeps will be marked in the field.

The City performed inspections as appropriate during the month of February. Section 6 describes the self-inspection logs that were used to record observations during the inspections. Inspection forms will be 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 February, the City began the process of addressing the conditions, identified in the inspections described in Section 5.1, as requiring remediation. These actions are performed as part of intermediate cover placement and grading activities. The City will also address any conditions that require remedial actions identified in future inspections.

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

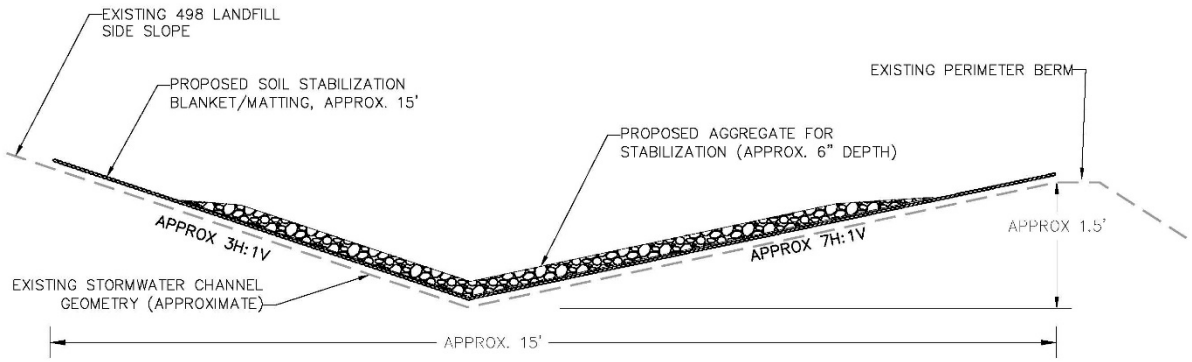
As noted in Section 4.1 the plans that SCS prepared for Closure of SWP #498 included measures to address stormwater management on the landfill. The stormwater management plans were discussed and included in the January Monthly Compliance Report for the SWP #498 landfill.

6.2 CLEANOUT OF STORMWATER DIVERSION CHANNEL/TRENCH BERM

The City has completed clean-out of the stormwater diversion channel/trench berm. The sediment deposited in the channel has been removed. Erosion control matting was placed in the channel to apply stabilization. Drainage aggregate was placed on top of the erosion control matting to anchor

the matting and provide addition stabilization. Figure 1 below shows a cross sectional view of the general arrangement of the stabilization features.

Figure 1. Stormwater Diversion Channel/Trench Berm Stabilization



SCS Engineers conducted a site visit on February 24, 2023 to observe progress on the Stormwater Diversion Channel/Trench Berm Repairs. Figure 2 depicts the progress of work on the channel observed during that site visit.

Figure 2. Stormwater Diversion Channel/Trench Berm Work Progress

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 these log and the intended inspection process were detailed in the November Monthly Compliance Report for the SWP #498 Landfill. Copies of the log templates are also included in that report.

7.2 FACILITY TRAINING

On November 30, 2022, SCS personnel, Ryan Mahon, 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 #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 - 12/01/2022 to 02/28/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Init Temp (F)	System Pressure ("H20)	Comments
16	12/8/2022 12:33	52.4	37.4	0.0	10.2	-6.8	-6.1	60.8	-8.3	No Change
16	1/5/2023 13:14	32.4	35.0	0.0	32.6	-22.8	-22.8	56.3	-24.2	
16	2/1/2023 13:49	61.2	37.3	0.1	1.4	-8.9	-8.9	55.6	-23.9	Increased Flow/Vacuum
16	2/1/2023 13:50	60.7	37.9	0.0	1.4	-21.1	-21.1	46.0	-21.1	
17	12/8/2022 12:35	58.2	41.6	0.0	0.2	-7.7	-8.2	61.7	-8.8	Increased Flow/Vacuum
17	1/5/2023 13:16	56.3	38.1	0.0	5.6	-24.5	-24.5	63.8	-24.6	
17	2/1/2023 13:52	55.6	37.0	0.0	7.4	-23.9	-23.8	44.3	-23.6	Increased Flow/Vacuum
18	12/8/2022 12:43	52.9	39.9	0.0	7.2	-5.3	-5.9	60.4	-9.7	Opened Valve 1/2 to 1 Turn
18	1/5/2023 13:26	47.9	38.0	0.0	14.1	-17.2	-17.1	66.7	-24.2	
18	2/1/2023 13:31	62.0	38.0	0.0	0.0	-0.3	-0.3	54.5	-23.9	Increased Flow/Vacuum
19	12/8/2022 12:52	17.9	16.1	0.9	65.1	-10.6	-10.4	57.7		Opened Valve 1/2 Turn or Less
19	12/9/2022 09:10	9.4	16.0	0.0	74.6	-13.1	-13.0	51.8		Increased Flow/Vacuum
19	12/20/2022 11:11	7.0	11.4	6.5	75.1	-21.7	-21.6	46.7		Fully Closed
19	12/20/2022 12:03	0.3	6.0	19.0	74.7	-17.7	-17.8	52.7	-23.1	Increased Flow/Vacuum
19	1/6/2023 08:13	3.3	14.1	3.7	78.9	-17.8	-17.8	41.3	-24.1	
19	2/1/2023 13:42	5.5	3.0	18.5	73.0	-12.7	-11.0	47.1	-23.9	
20	1/25/2023 11:38	8.6	10.6	6.0	74.8	-0.1	-0.4	68.4		Closed Valve > 1 Turn
20	2/1/2023 13:35	5.1	11.7	9.2	74.0	-20.1	-20.1	64.7		Closed Valve > 1 Turn
21	1/25/2023 11:41	7.0	5.7	15.9	71.4	-1.4	-1.4	63.2		Closed Valve > 1 Turn
21	2/1/2023 13:38	4.3	5.0	18.2	72.5	-1.2	-1.2	58.4		Closed Valve > 1 Turn
23	12/8/2022 12:24	0.4	0.5	20.9	78.2	-0.3	-0.2	53.1	-3.9	Increased Flow/Vacuum
23	1/5/2023 13:20	0.1	0.6	20.6	78.7	-0.1	-0.1	57.9	-24.4	
23	2/1/2023 13:55	0.8	2.2	21.0	76.0	0.0	0.0	45.2	-18.3