

# April Monthly Compliance Report

Solid Waste Permit No. 221  
Bristol Integrated Solid Waste Management Facility  
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**SCS ENGINEERS**

02218208.05-18 | May 10, 2023

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## **INTRODUCTION**

On behalf of the City of Bristol, Virginia (City), SCS Engineers (SCS) has prepared this report to the Virginia Department of Environmental Quality (VDEQ). This report covers the Solid Waste Permit (SWP) No. 221 Landfill during the month of April.

The following sections outline actions completed towards the applicable items in Appendix B of the Consent Decree. The sections have been numbered to align with the numbering in Appendix B.

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

As outlined in Appendix B of the Consent Decree, cover integrity of the SWP No. 221 Landfill will be managed primarily through ongoing surface emissions monitoring in accordance with Federal and State regulations.

### **2.3 SURFACE EMISSIONS MONITORING**

On October 12, 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 surface emissions monitoring were included in the October 2022 Monthly Compliance Report for the SWP No. 221 Landfill and in a letter outlining the results submitted to VDEQ on October 28, 2022.

On January 26, 2023, SCS performed a “Target Zone” SEM event, where points were collected at locations that showed visual characteristics of a potential exceedance location (erosion rills, bare spots where vegetation was lacking, etc.). The results of this SEM event were summarized in the January 2023 Monthly Compliance Report for the SWP No. 221 Landfill.

The 2023 Annual SEM Event will be performed later this year.

### **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**

There are currently 15 vertical extraction wells in the SWP No. 221 Landfill Area (Well Nos. 1 – 15). In waste disposal units where the age of the buried wastes is greater than 40 years, as is the case at SWP No. 221 Landfill, the rate and quantity of decomposition gas production declines significantly compared to the rate and quantity of LFG generated in more recently buried wastes. There is no historical evidence of elevated temperatures in the SWP No. 221 Landfill. Also, the No. 221 Landfill Area is not believed to be a significant source of fugitive LFG emissions or odors.

Adjustments are made during wellhead monitoring to optimize gas quality and applied vacuum on the Area 221 wells. All Area 221 wells are under vacuum. During the April monitoring event, adjustments were made as necessary to tune the recently installed 1-inch wellheads on all extraction wells in Area 221. The average gas composition in the Area 221

wells is shown in Table 1. Methane and Carbon Dioxide increased while Oxygen decreased this month from tuning the wellheads.

Table 1. Monthly Average Wellhead LFG Composition – SWP No. 221 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.)
November 2022	47.4	33.7	3.3	-11.9
December 2022	58.7	39.6	0.3	-2.7
January 2023	39.8	27.0	6.0	-20.6
February 2023	42.5	28.1	7.2	-15.6
March 2023	53.5	33.6	2.9	-20.4
April 2023	56.7	35.2	1.2	-20.7

## 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 No. 221 landfill. Additional details about that plan were included along with a copy of the plan in the November 2022 Monthly Compliance Report for the SWP No. 221 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 No. 221 Landfill in accordance with the plan were summarized in the January 2023 Monthly Compliance Report for the SWP No. 221 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 April 3, 2023, SCS Field Services (SCS-FS) visited the landfill and performed monitoring of the landfill gas wells. The results of the monthly monitoring were submitted to VDEQ on May 4, 2023 and are included in Appendix A.



Appendix A  
April Monthly Wellhead Monitoring Data

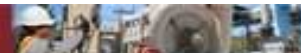
## Bristol Virginia Landfill - Permit 221 Well Data - 02/01/2023 to 04/30/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	Temp (F)	System Pressure ("H2O)	Comments
01	2/1/2023 12:37	55.2	35.1	9.7	0.0	-19.0	-21.1	43.4	-22.2	
01	3/1/2023 09:32	59.7	36.0	0.9	3.4	-20.7	-20.8	67.8	-21.1	Increased Flow/Vacuum
01	3/7/2023 09:22	62.0	38.0	0.0	0.0	-21.1	-21.0	72.6	-21.0	Opened Valve 1/2 Turn or Less
01	3/13/2023 08:48	61.8	37.1	0.8	0.3	-22.9	-22.8	46.1	-22.8	Increased Flow/Vacuum
01	3/13/2023 08:48	61.8	37.1	0.8	0.3	-22.9	-22.8	46.1	-22.8	Increased Flow/Vacuum
01	3/13/2023 08:48	61.8	37.1	0.8	0.3	-22.9	-22.8	46.1	-22.8	Increased Flow/Vacuum
01	4/3/2023 09:53	60.4	37.0	0.0	2.7	-22.4	-22.4	55.7	-22.6	Valve Adjustment:Valve completely open
02	2/1/2023 12:26	15.5	10.2	16.8	57.5	-20.5	-19.9	46.7	-24.2	
02	2/28/2023 09:35	25.0	14.8	12.4	47.8	-8.7	-8.8	65.4	-18.3	
02	3/1/2023 09:36	50.9	31.1	3.6	14.4	-21.1	-21.1	61.3	-21.2	No Change
02	3/7/2023 09:26	37.4	23.4	7.9	31.3	-21.0	-20.3	63.9	-21.0	Close_Task
02	3/13/2023 11:22	66.0	33.7	0.3	0.0	-10.3	-13.3	47.3	-22.8	Increased Flow/Vacuum
02	4/3/2023 09:56	60.6	37.2	0.1	2.1	-22.6	-22.4	55.6	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
03	2/1/2023 12:15	3.3	3.2	20.2	73.3	-5.4	-4.8	45.9	-24.1	
03	2/28/2023 09:39	63.2	36.8	0.0	0.0	-9.5	-10.7	67.0	-18.8	Increased Flow/Vacuum
03	3/1/2023 09:42	52.7	33.1	2.8	11.4	-21.2	-21.2	62.7	-21.1	No Change
03	3/7/2023 09:29	36.7	23.4	8.0	31.9	-21.1	-21.0	66.1	-21.0	Close_Task
03	3/13/2023 11:17	54.2	33.9	2.9	9.0	-23.0	-22.9	46.8	-23.0	Increased Flow/Vacuum
03	4/3/2023 10:00	55.0	34.6	1.7	8.7	-22.4	-22.4	56.6	-22.5	Valve Adjustment:Opened Valve 1/2 to 1 turn
04	2/1/2023 12:09	45.2	31.5	4.7	18.6	-20.7	-20.7	49.7	-24.2	Increased Flow/Vacuum
04	2/1/2023 12:11	43.2	30.8	5.2	20.8	-21.9	-21.9	45.9	-24.1	
04	2/28/2023 09:43	61.3	38.7	0.0	0.0	-5.2	-5.7	76.1	-19.0	Increased Flow/Vacuum
04	3/1/2023 09:51	60.2	39.8	0.0	0.0	-18.1	-18.1	67.7	-21.0	Increased Flow/Vacuum
04	3/1/2023 09:55	59.6	38.6	0.4	1.4	-20.5	-20.9	72.5	-20.9	Increased Flow/Vacuum
04	3/1/2023 09:56	60.2	38.7	0.1	1.0	-21.0	-21.0	71.5	-21.1	Increased Flow/Vacuum
04	3/7/2023 09:36	53.4	35.8	2.5	8.3	-21.2	-21.1	74.5	-21.0	No Change
04	3/13/2023 11:14	59.6	39.9	0.6	0.0	-23.0	-23.0	48.9	-23.1	Increased Flow/Vacuum
04	4/3/2023 10:08	57.8	39.9	0.0	2.3	-22.3	-22.3	58.6	-22.6	Valve Adjustment:Valve completely open
05	2/1/2023 13:18	59.0	41.0	0.0	0.0	-23.9	-23.9	42.0	-23.9	Increased Flow/Vacuum
05	2/28/2023 09:50	60.2	39.8	0.0	0.0	-4.7	-5.3	75.3	-19.2	Increased Flow/Vacuum
05	3/1/2023 10:01	59.4	39.4	0.2	1.0	-20.6	-20.9	65.9	-21.1	Increased Flow/Vacuum
05	3/7/2023 09:40	30.4	21.5	9.9	38.2	-21.2	-21.1	73.0	-21.1	Close_Task
05	3/13/2023 11:06	53.2	36.0	2.5	8.3	-23.0	-22.9	49.9	-23.0	No Change
05	4/3/2023 10:11	56.3	37.4	0.4	5.8	-22.3	-22.3	57.4	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
06	2/1/2023 13:14	13.1	8.2	17.5	61.2	-23.1	-23.1	53.7	-23.9	



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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
06	2/28/2023 08:53	29.6	16.0	11.2	43.2	-5.4	-5.4	65.9	-22.5	Increased Flow/Vacuum
06	3/1/2023 08:49	63.7	34.0	0.7	1.6	-21.5	-21.7	60.9	-21.7	Increased Flow/Vacuum
06	3/1/2023 08:52	64.7	35.3	0.0	0.0	-21.8	-21.8	61.5	-21.7	Increased Flow/Vacuum
06	3/7/2023 08:43	65.0	34.0	0.9	0.1	-21.1	-21.1	65.9	-21.1	No Change
06	3/13/2023 08:06	34.8	20.4	9.0	35.8	-22.6	-22.5	45.2	-22.6	Close_Task
06	4/3/2023 09:23	45.9	25.0	6.1	23.1	-22.3	-22.3	54.2	-22.6	No Change
07	2/1/2023 13:12	63.2	36.8	0.0	0.0	-1.8	-1.8	59.2	-19.4	Increased Flow/Vacuum
07	2/28/2023 09:01	64.4	35.6	0.0	0.0	-0.3	-0.5	71.5	-22.2	Increased Flow/Vacuum
07	3/1/2023 08:55	59.3	40.7	0.0	0.0	-4.7	-8.7	65.6	-21.3	Increased Flow/Vacuum
07	3/7/2023 08:47	60.0	40.0	0.1	0.0	-15.7	-16.4	69.6	-20.9	Increased Flow/Vacuum
07	3/13/2023 08:11	57.8	38.4	1.0	2.8	-19.1	-20.1	47.8	-22.7	Increased Flow/Vacuum
07	4/3/2023 09:26	59.1	33.6	0.0	7.3	-20.4	-21.0	55.7	-22.7	Valve Adjustment:Opened Valve 1/2 to 1 turn
08	2/1/2023 13:08	3.9	3.2	20.4	72.5	-1.2	-1.2	51.6	-22.5	
08	2/28/2023 09:04	20.9	12.3	13.7	53.1	-20.4	-19.9	65.9	-22.1	No Change
08	3/1/2023 09:00	51.0	30.8	3.6	14.6	-20.4	-21.0	69.9	-20.9	Increased Flow/Vacuum
08	3/7/2023 08:52	63.0	36.3	0.7	0.0	-21.0	-21.0	73.3	-20.9	Increased Flow/Vacuum
08	3/13/2023 08:15	24.4	15.7	12.7	47.2	-22.5	-14.2	46.8	-22.5	Close_Task
08	4/3/2023 09:29	36.1	22.7	8.6	32.5	-19.7	-19.3	53.2	-22.6	Valve Adjustment:Closed valve 1/2 to 1 turn
09	2/1/2023 13:00	55.0	36.8	1.7	6.5	-23.9	-23.9	45.8	-17.2	Increased Flow/Vacuum
09	2/28/2023 09:13	54.4	33.3	2.6	9.7	-21.3	-21.4	62.7	-22.0	Increased Flow/Vacuum
09	3/1/2023 09:10	60.7	39.3	0.0	0.0	-21.2	-21.1	69.3	-21.1	Increased Flow/Vacuum
09	3/7/2023 09:01	7.0	5.0	19.2	68.8	-21.0	-21.0	72.0	-20.9	Close_Task
09	3/13/2023 08:22	35.8	24.8	8.3	31.1	-22.5	-21.2	44.9	-22.6	No Change
09	4/3/2023 09:36	57.1	36.0	1.0	5.9	-18.3	-21.0	54.4	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
10	2/1/2023 12:54	58.5	41.5	0.0	0.0	-0.4	-1.1	46.7	-23.8	Increased Flow/Vacuum
10	2/28/2023 09:17	59.3	40.7	0.0	0.0	-21.4	-21.3	71.7	-22.1	Increased Flow/Vacuum
10	3/1/2023 09:13	58.8	40.0	0.2	1.0	-21.2	-21.1	66.4	-21.0	Increased Flow/Vacuum
10	3/7/2023 09:06	38.4	27.8	6.8	27.0	-21.1	-21.0	70.0	-20.9	Close_Task
10	3/13/2023 08:36	58.4	40.4	0.6	0.6	-22.6	-22.6	46.0	-22.6	Increased Flow/Vacuum
10	3/13/2023 08:36	58.4	40.4	0.6	0.6	-22.6	-22.6	46.0	-22.6	Increased Flow/Vacuum
10	3/13/2023 08:36	58.4	40.4	0.6	0.6	-22.6	-22.6	46.0	-22.6	Increased Flow/Vacuum
10	4/3/2023 09:39	58.5	38.7	0.0	2.8	-22.7	-22.7	54.0	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
11	2/1/2023 12:50	60.6	39.4	0.0	0.0	-3.4	-3.8	45.9	-21.2	
11	2/28/2023 09:27	36.3	23.3	8.1	32.3	-13.6	-13.7	69.0	-14.4	No Change
11	3/1/2023 09:23	60.3	37.0	0.6	2.1	-21.1	-21.1	64.8	-21.1	Opened Valve 1/2 Turn or Less



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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
11	3/7/2023 09:15	56.7	34.3	2.0	7.0	-21.0	-21.0	69.7	-21.0	No Change
11	3/13/2023 08:41	22.3	15.3	13.8	48.6	-22.7	-19.7	44.9	-22.6	Close_Task
11	4/3/2023 09:47	60.8	38.5	0.0	0.7	-1.8	-4.0	55.1	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
12	2/1/2023 12:46	46.7	31.0	5.0	17.3	-24.0	-24.0	48.6	-24.3	Increased Flow/Vacuum
12	2/28/2023 09:30	40.3	25.7	6.8	27.2	-16.1	-16.1	69.3	-16.2	
12	3/1/2023 09:27	61.0	39.0	0.0	0.0	-21.1	-21.1	67.1	-21.2	Increased Flow/Vacuum
12	3/7/2023 09:18	60.7	37.2	0.7	1.4	-21.1	-21.1	69.8	-20.9	Increased Flow/Vacuum
12	3/13/2023 08:45	60.5	39.2	0.3	0.0	-22.7	-22.6	44.3	-22.6	Increased Flow/Vacuum
12	4/3/2023 09:50	60.1	37.5	0.0	2.5	-22.5	-22.5	56.1	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
13	2/1/2023 12:19	58.9	38.0	0.9	2.2	-23.8	-23.8	46.8	-24.1	Increased Flow/Vacuum
13	2/1/2023 12:22	58.4	38.4	0.8	2.4	-24.2	-24.1	43.8	-24.1	
13	2/28/2023 09:46	62.2	37.6	0.2	0.0	-19.3	-19.3	78.1	-19.2	No Change
13	3/1/2023 09:47	60.7	38.3	0.3	0.7	-6.4	-11.9	64.1	-21.0	Increased Flow/Vacuum
13	3/7/2023 09:33	33.8	23.1	8.8	34.3	-19.5	-18.9	66.8	-21.0	Close_Task
13	3/13/2023 11:10	55.5	35.6	2.2	6.7	-10.8	-14.3	49.4	-23.0	Increased Flow/Vacuum
13	4/3/2023 10:05	59.5	38.4	0.1	2.1	-20.7	-21.2	57.1	-22.5	Valve Adjustment:Opened Valve 1/2 to 1 turn
14	2/1/2023 13:05	26.1	16.7	12.1	45.1	-23.2	-23.2	60.8	-23.9	
14	2/28/2023 09:09	66.5	33.4	0.1	0.0	-9.9	-9.8	56.0	-21.9	Increased Flow/Vacuum
14	3/1/2023 09:04	64.4	34.0	0.6	1.0	-18.8	-21.0	69.9	-21.1	Increased Flow/Vacuum
14	3/7/2023 08:56	65.0	34.5	0.6	0.0	-21.0	-21.0	72.4	-20.9	Increased Flow/Vacuum
14	3/13/2023 08:27	48.5	27.9	5.2	18.4	-22.5	-22.5	43.4	-22.6	No Change
14	4/3/2023 09:32	64.1	33.9	0.0	2.0	-22.7	-22.5	53.6	-22.6	Valve Adjustment:Opened Valve 1/2 to 1 turn
15	2/1/2023 12:34	56.6	36.3	7.0	0.1	-3.4	-3.5	51.1	-24.5	Increased Flow/Vacuum
15	3/1/2023 09:18	61.3	38.6	0.1	0.0	-20.9	-21.0	67.3	-21.1	Increased Flow/Vacuum
15	3/7/2023 09:11	42.4	28.9	5.9	22.8	-21.0	-21.0	68.4	-21.0	Close_Task
15	3/13/2023 08:31	58.6	38.0	1.3	2.1	-22.6	-22.6	46.3	-22.6	Increased Flow/Vacuum
15	3/13/2023 08:31	58.6	38.0	1.3	2.1	-22.6	-22.6	46.3	-22.6	Increased Flow/Vacuum
15	3/13/2023 08:31	58.6	38.0	1.3	2.1	-22.6	-22.6	46.3	-22.6	Increased Flow/Vacuum
15	4/3/2023 09:42	59.4	38.1	0.0	2.5	-22.6	-22.5	54.6	-22.5	Valve Adjustment:Valve completely open

